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Problematising philosophical assumptions in EE's Invisible College

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Abstract

Purpose: This paper seeks to energise discussion around philosophical assumptions in Entrepreneurship Education (EE). Far from being abstract considerations, this paper underscores that philosophical assumptions – which are embodied in research products, and inherited from others - have practical implications.

Study design/methodology/approach: Our approach is to purposefully unsettle taken for granted assumptions implicit within 44 influential articles which have been said to reveal EE's Invisible College. We utilise three heuristic tools offered by problematisation - identifying paradigmatic assumptions, (re)conceptualizing subject matter and making a reversal – to explore the implications of the meta-theoretical underpinnings of this body of work. The goal of this paper is not to find a definitive answer to the question 'what is EE's underlying philosophy?' but rather asks 'what can we learn about philosophical assumptions by reconsidering this particular set of influential articles at a deep level?'

Findings: With some notable expectations, EE's Invisible College is a place where ideas about an external social reality accessible to the dispassionate researcher are implicitly accepted, where assumptions about the possibility of objective knowledge and the superiority of scientific methodology dominate and where functionalist research products reproduce the social status quo. Thus, whilst the EE research studied might appear diverse at a surface level (topics, research design, inter-disciplinary perspective), diversity is less apparent when considering the deeper, philosophical assumptions which underpin this body of work.

Originality/value: Revealing assumptions which are embodied within research products may prompt critical thinking about the practical implications of research philosophies in the field of EE. In considering the implications of philosophical assumptions, a connection is made between problems that are observed at surface level - from lack of legitimacy, criticality and taken for grantedness of the field - to the deeper *hidden system of ideas* which lies beneath. Having highlighted potential problems of these deeper assumptions, the paper concludes by posing questions in relation to *the type of research* that is pursued and legitimised in the field of EE, the *socialisation of researchers* and the implications for *criticality* in the field. Such issues illustrate that, far from philosophical assumptions being an abstract or unimportant concern, they are highly practical and have the power to constrain or empower action and the social impact of research.

Key Words: Entrepreneurship Education, Invisible College, Philosophy, Problematisation.

Problematising Philosophical Assumptions in EE's 'Invisible College'

Introduction

Entrepreneurship Education (EE) is said to be at a crossroads (Loi *et al.*, 2021). Policy makers, educators and individuals have been persuaded of its value and courses and programmes have proliferated exponentially; yet EE itself, as an academic field, is said to have limited legitimacy (Loi *et al.*, 2021; Fayolle *et al.,* 2016). Indeed, EE may even be "a victim" of its broad and rapid success if its assumptions and intentions are not debated, and therefore sound more like power and ideology (Loi *et al.*, 2021, p. 9). Questions over the relevance, coherence, appropriateness and social usefulness of EE have been asked for some time (Fayolle, 2013), with a lack of criticality and unquestioning reproduction of taken for granted practice and assumptions limiting its legitimacy (Berglund and Verduijn, 2018). In this conversation about the legitimacy of EE, the state of entrepreneurship *education* is contrasted with that of *entrepreneurship*, which is said to have a more advanced level of scholarship (Neergaard *et al.*, 2017; Neck and Corbett, 2018). Entrepreneurship has been called the 'mother field' or 'primary field' from which entrepreneurship education derives and therefore it is useful to compare scholarly development between the two fields (Thrane *et al.*, 2016). One important development in entrepreneurship scholarship is the increasing attention paid towards issues of philosophy in research, with successive authors articulating the importance of underlying assumptions in scholarly material (Pittaway, 2005; Alvarez and Barney, 2010; Pittaway and Tunstall, 2015; Packard, 2017; Ramoglou and Tsang, 2017; Garud *et al.*, 2018; Munoz and Kimmitt, 2018). These authors illustrate that research products embody assumptions regarding some view of the world, some view of knowledge, some assumptions about human behaviour and the nature of society. These assumptions, it is argued, *are implicit within* the research products that are created, even when they are not *explicitly* articulated. Exploring these assumptions is considered important work which will develop the legitimacy of the field and

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the criticality of scholars (Fayolle et *al*., 2016), and which should involve challenging taken

for granted assumptions and unsettling dominant perspectives and uncontested truths

(Berglund, Hytti and Verduijn, 2020).

In entrepreneurship *education*, writing about philosophy has tended towards being concerned

with its relationship to educational practice. For example, describing the importance of

ontological and epistemological underpinnings regarding a world view of EE (Gibb, 2002); the

need for educators to reflect upon the philosophical underpinnings of their practice (Hannon,

2005), critiquing the 'old' capitalist philosophy of EE practice (Rae, 2010), and, more recently,

comparing the epistemic stances of EE courses (Bhatia and Levina, 2020). A greater

consideration of philosophy in EE has been identified as a means of promoting and developing

more ethical practitioners and critical thinkers (Berglund and Verduijin, 2018). It has been

noted that philosophies implicit within EE *research* is a neglected area, with a lack of clarity

and exploration regarding ontological and epistemological dimensions limiting the legitimacy

of the field and more critical stances needed to advance and unsettle thinking (Fayolle *et al.*,

2016; Neergaard *et al.*, 2017; Berglund, Hytti and Verduijn, 2020).

The focus of this article is to surface and question philosophical assumptions in EE research in

order that EE researchers have an opportunity to (re)consider what problems might exist with

these assumptions and how the research community might seek to resolve them.

To do this we utilise some of the resources offered by problematisation (Abbott, 2004;

Alvesson and Sandberg, 2013), an approach which aims to make explicit taken for granted

assumptions in existing literature or *a body of work*. This approach is different from a

thematic, integrative or even a critical review as it involves *going beyond* concerns about

definitions, concepts and/or the content of research (Alvesson and Sandberg, 2013; Alvesson

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and Sandberg, 2020). Such conceptual and definitional labels often have "no clear or absolute boundaries" and have an 'endless variation' in their usage (Alvesson and Sandberg, 2020, p. 1292). Indeed, privileging "hegemonic ambiguous big concepts" is discussed as a problem with regular review approaches as it forces researchers to position themselves within a particular knowledge domain, camouflage confusion and promote sameness (Alvesson and Sandberg, 2020, pp. 1292 - 1293). Problematisation rather tries to go beyond the focus on "labels" and the "analytics of the surface material" (Alvesson and Sandberg, 2020, p. 1300), and instead aims to consider the "very pre-suppositions" that are made within research products, that is the *ontological*, *epistemological* and *sociological* assumptions which underlie specific literature (Alvesson and Sandberg, 2013, p. 52).

Problematisation is also described as being rooted in the habit of questioning generalisations and background assumptions, and asking "is this really true…or could I get somewhere regarding this as a problem rather than as something taken for granted?" (Abbott, 2004, p. 126). The approach offers a number of heuristic tools through which problematisation can be developed; however, the broad thrust of the process is to *deliberately* identify and challenge assumptions and unsettle what is already 'known' around a subject by (re)considering assumptions in literature (Alvesson and Sandberg, 2013, 2020). The purpose of adopting a problematisation approach in this article is not to be purposefully counter-intuitive in the hope of being interesting (Tsang, 2021), but rather to explore phenomena which may be taken for granted in the sense of being unexplored (Quattronne and Hopper, 2001). Before we introduce the body of work which was the focus for this problematisation, we elaborate the approach to inquiry to orient the reader as to how the paper unfolds.

Problematisation as an approach to inquiry

Problematisation methodology encourages researchers to identify and challenge implicit but routinely taken-for-granted assumptions within a body of literature. It is an alternative to gap-spotting or gap-filling, which often builds on or around existing literature rather than identifying and challenging foundational assumptions (Alvesson and Sandberg, 2013, 2020). The ultimate aim of problematisation is to generate questions which will open up and unsettle what we already 'know' around a subject (Alvesson and Sandberg, 2013, p. 13). Whilst a number of methodological steps have been elaborated to support the process of identifying and challenging assumptions in literature (Alvesson and Sandberg, 2013), problematisation is also described as an organic and adaptive approach to inquiry, with principles to be applied creatively to support specific research goals (Alvesson and Sandberg, 2020).

The development of the arguments presented in this paper evolved over a number of stages. In the first place, the first author of this paper conducted a review of the articles identified as belonging to EE's 'Invisible College' (the detail of this is discussed further in following sections). Following this, the product of this review - a matrix of ontological, epistemological and sociological assumptions (Appendix A) - was used as a focus for problematisation (Alvesson and Sandberg, 2013), developed and articulated by both authors. Specifically, three heuristic tools offered by problematisation are utilised in this paper - identifying paradigmatic assumptions, (re)conceptualizing subject matter and making a reversal – to explore and articulate the implications of the meta-theoretical underpinnings in the chosen body of work. Together, and prior to this paper, the authors presented a discussion of the methodological aspects of problematisation (Authors, 2018), and then refined and rehearsed the arguments which resulted from that process (Authors, 2019). Thus, the iterative advancement of this article via two conference papers and the journal review process underscores the role of ones'

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research community of practice in questioning and developing research products (Tavory and Timmermans, 2014) and the role drafting and writing (Menary, 2007), has played in the crafting of empirical material which aims to open up assumptions for problematisation (Alvesson and Sandberg, 2013).

This paper unfolds in the following steps. First we introduce the notion of a problematising review and identify a domain of literature for assumption challenging - EE's 'Invisible College' – a body of work including many highly cited EE texts which continue to be referenced today. Then we describe what makes a paradigmatic assumption and elaborate the process of *identifying paradigmatic assumptions* (Alvesson and Sandberg, 2013, 2020), within the research products reviewed. Critical insights gained into the body of work studied are presented, then the problematising heuristic of *(re)conceptualisation* (Alvesson and Sandberg, 2013, Abbott, 2004), is used to suggest an alternative way of thinking about EE's Invisible College. Following this, the problematising heuristic of *making a reversal* (Alvesson and Sandberg, 2013; Abbott, 2004), is used to open up new possibilities of interpretation, specifically in relation to ideas about the hidden systems of ideas which underpin social action (Midgely, 1992). We conclude by exploring implications for research and practice and offering questions which arise as a result of considering the practical importance of philosophical assumptions.

Identifying a paradigmatic body of work

Problematisation regards reviews of literature as an exercise in how to "re-think existing literature in ways that generate new and 'better' ways of thinking about specific phenomena" (Alvesson and Sandberg, 2020, p. 1290). Alvesson and Sandberg explain problematisation is about "critical scrutiny and insight generation" *not* "vacuum cleaning" literature (Alvesson and Sandberg, 2020, p. 1298). Thus, problematisation is a very different approach to a systematic

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or integrative review. The idea is to identify and scrutinise a paradigmatic body of work in a way which can act as a catalyst for "starting new conversations, not continuing old ones" (Alvesson and Sandberg, 2020, p. 1291). The approach requires that a review domain should be constructed or selected in a "thoughtful, creative and critical" way (Alvesson and Sandberg, 2020, p. 1292), and have a stronger focus on "paradigmatic assumptions and ways of constructing reality" (Alvesson and Sandberg, 2020, p. 1300).

A body of work of particular interest in this regard is a set of articles, identified through a co-citation analysis, said to have revealed EE's 'Invisible College' (Loi et al, 2016). This study is said to elucidate the 'theoretical foundations' and 'the intellectual structure of the field' by studying co-citations recorded in the ISI Web of Science' (Loi et al, 2016, p. 949) and revealing 'EE's Invisible College' and a particular 'school of thought'. This indicates the requisite paradigmatic quality which is sought in a problematisation exercise, in that this body of work has already been proposed as having some *deeper* level characteristics rather than simply sharing a label-focussed surface level characteristics.

To further facilitate understanding regarding why this body of work is appealing to explore, the idea of an Invisible College is considered in the following section.

EE's Invisible College

The term Invisible College is associated with the birth of modern science, when a small group of scholars met face to face and exchanged ideas on nature, science and philosophy and went on to become prominent figures in the Royal Society (Lomas, 2009). This sort of frequent communication between specialists is still said to be a hallmark of modern science (Bakker, 2007), with the exchange of ideas happening through networks of scientific papers (De Solla Price, 1963) and bibliometric studies traditionally being used as a means to map this scientific communication (Lievrouw, 1989).

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EE's Invisible College is said to have been revealed by a bibliometric study, where a co-citation analysis was conducted on literature spanning the period 1991 – 2014 to identify the most influential and connected articles in the field (Loi *et al*., 2016). The co-citation approach is said to "map a specific domain's collective cognitive patterns over a particular period of time" (Loi *et al.*, 2016, p. 950), thus whilst many of the articles revealed by Loi *et al* are not new, they are influential and oft-cited. Indeed, data collected on the continued citation of these papers (see Appendix A), shows that *every* article has been cited in the current year, and all papers have been cited (between dozens and *thousands* of times), since the Loi *et al.* paper was published, demonstrating the ongoing scholarly influence of articles (and assumptions) in this body of work. The practical relevance of texts included in EE's Invisible College can also be seen in current policy, for example, Peterman and Kennedy (2003), Athayde (2009) and Oosterbeek *et al*. (2010), are used to justify EE recommendations that guide present day practice (Hanson, Hooley and Cox, 2017), and are included in research reviews that aim to influence policy (Hughes *et al.*, 2016).

In a co-citation analysis, connections *between* articles are investigated - the stronger the relationship between two pieces of work, the more likely they are related to a particular *school of thought* (Loi *et al.*, 2016). This approach is a means of "unfolding the theoretical core" of a field, "thereby revealing an invisible college among the associated articles and topics" (Loi *et al.*, 2016, p. 950). That the articles identified by Loi *et al.* are said to represent EE's Invisible College - its intellectual structure and the *theoretical foundations* of the field – prompts the question: what can we learn about *philosophical assumptions* by reconsidering this body of work from a deeper - philosophical - perspective? Just as Loi *et al*. were able to say something about the theoretical core of the literature, this pre-defined and paradigmatic literature offers an interesting target for problematisation of philosophical assumptions.

We find this an interesting and useful process to pursue, because, in our own learning, it has been through grappling with ideas which work at a deeper, philosophical level - such as critical (Bhaskar, 1974), and scientific (Pawson, 2006), realism and philosophy in educational research (Biesta, 2007), and entrepreneuring and becoming in entrepreneurial learning (Johannisson, 2011; Steyart, 2007) - that a fuller appreciation of the influence of assumptions in research products has been developed. Thus, surfacing and questioning assumptions in EE's Invisible College may be useful for researchers in our EE community of practice, prompting thinking about the practical implications of seemingly abstract philosophical considerations. To execute this approach, the utilisation of three heuristic tools of problematisation - identifying paradigmatic assumptions, (re)conceptualizing subject matter and making a reversal – is articulated in the following sections to provoke thinking and generate new questions.

Identifying Paradigmatic Assumptions

A purpose of problematisation is to "transform what are commonly seen as truths or facts into assumptions" (Alvesson and Sandberg, 2013, p. 59). The assumptions this article aims to unsettle are not related to the content or the constructs of research, but rather 'the very pre-suppositions' that are made when researchers develop and present theory (Alvesson and Sandberg, 2013, p. 52). These types of assumptions are called paradigmatic assumptions, that is, they embody some sort of paradigm or say something about particular 'world views' regarding the nature of reality, society and knowledge (Alvesson and Sandberg, 2013, p. 59).

Previously, methodological approaches in EE have been the focus of review, for example, exploring methods, types of study, data collection and analysis techniques (Blenker *et al.*, 2014). In addition, an axiological lens has been used to explore values in EE, for examples, by contrasting profit driven values and their consequences, with values which include social, environmental and well- being (Refai *et al.*, 2018). But there are calls for more exploration of

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ontological, epistemological and sociological assumptions (Fayolle *et al.*, 2016). Exploring such assumptions offers the opportunity to undertake a 'broader and more fundamental' form of problematisation (Alvesson and Sandberg, 2013, p. 55), which may surface the philosophical underpinnings of literature and enable the pre-suppositions of research products to be better understood, and therefore, critiqued. If underpinning assumptions are left unexplored, the opportunity to consider 'alternative world views' (Alvesson and Sandberg, 2013, p. 59), is missed, whereas, considering this deeper level can help open up material and make the implicit or hidden explicit and laid open to scrutiny. But how does one go about doing this? Particularly when, as Cunliffe (2011), observes many research products do not declare such assumptions.

First, a number of *meta-theoretical* stances which describe underlying ontological, epistemological and sociological assumptions were used to support the process of discerning and interpreting cues in the articles (Table I). These meta-theoretical stances were combined to provide an a-priori conceptual framework (Bingham, 2021), from which articles could be considered and compared.

******Insert Table I – Meta-theories used to surface philosophical assumptions - around here*****

These meta-theoretical stances elaborate fundamental differences in the world views which research products can embody, from an ontological perspective (assumptions about the nature of reality), an epistemological perspective (assumptions about the nature of knowledge) and sociological perspective (assumptions about the nature of society). More binary (and easier to grasp) frameworks, such as Johnson and Duberley's (2000) continuum regarding the nature of social reality, were chosen alongside more the more complex and fluid framework provided by Cunliffe about epistemological assumptions (2011), and the four paradigms described by Burrell and Morgan (1979), which illuminate sociological assumptions about the nature of society. Combined, these meta-theoretical stances provide a conceptual platform to support a

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strategy of mild deductive reasoning (Emigh, 1997), where frameworks for thinking are used to compare and analyse data (the papers contained within EE's 'Invisible College', in this instance).

As summarised in Table I, ontological assumptions (beliefs about the nature of social reality) can be compared by considering opposing ends of an objectivist/subjectivist continuum where the objectivist view is that social reality exists independent of human consciousness and cognitions (Realism) and the subjectivist view is that reality is simply a product of our minds with no independent status (Nominalism). Epistemological assumptions can be compared by considering a continuum which includes subjective, objective and inter-subjective 'knowledge problematics.' Sociological assumptions can be compared in terms of considering the different orientations of research: functionalism, interpretative, radical humanism and radical structuralism. Finally, as many research products are not explicit about these deeper, philosophical assumptions, the deployment of language in how research accounts are constructed, methodological choices and the crafting of research is recognised as crucial in comparing differences between assumptions (Cunliffe, 2011).

In practice, comparing paradigmatic assumptions was an interpretative process of moving between, and re-interpreting, different cues within a piece of work (Alvesson and Sandberg, 2013, p. 59), in relation to the meta-theoretical stances being used to open up material.

This process involved: the first author collecting every article, reading and re-reading the texts in full and using the metatheoretical stances presented in Table I as prompts and signposts to compare philosophical assumptions. Whilst some articles were read only once and assumptions appeared more straightforward to interpret, for example quantitative studies where a "pre-test post-test control group research design" was used to measure effects of an EE programme (Peterman and Kennedy, 2003). Other articles, or specific sections or lines within such articles,

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were read repeatedly (for example Rae, 2006, which is discussed in more detail later), with conclusions less straightforward to infer because of the nuance in the research product and the different potential philosophical interpretations. As Cunliffe (2011), predicted, most works *did not* explicitly discuss or address ontological and epistemological assumptions, but rather, assumptions were interpreted from reviewing how "choice of method and language" embodied particular ontological and epistemological assumptions (Cunliffe, 2011, p. 659). Instead, elements of the research products - such as the research approach, a summary of the article and the type of language used - were extracted and used to build a matrix summarising interpretations about the philosophical assumptions implicit within the body of work. This matrix is offered at Appendix A and provides an overview of extracted material and philosophical assumptions interpreted using this approach. Within this interpretative process, it is important to acknowledge the 'constructed nature of empirical material' where, in the interplay of meta theory and empirical material, a researcher uses the latter as 'a source of inspiration for critical dialogue,' rather than unambiguously screening out one idea from another (Alvesson and Sandberg, 2013, p. 119). In addition, whilst the first author constructed the matrix and initial ideas about its implications, it was the act of taking this material and co-producing a conference paper with the co-author which provided the vehicle for argumentation about what the elements captured in the matrix might mean. In this process, *written sentences* – described as visible 'vehicles of thought' (Menary, 2007) – could be shared, edited, deleted and developed. In this case, through 15 versions of the first conference paper, 9 versions of the second paper and three paper revisions (involving several new paper iterations) in the process of preparing for publication. As the authors, like many academic writers, are not geographically co-located, it was through the act of making thoughts and ideas visible in word documents - which could be commented on, edited, deleted and developed - that insights were shared, agreed and developed into what is presented in this paper.

Returning to this paper, Table II provides exemplars from the matrix illustrating key elements of articles which supported interpretation regarding philosophical assumptions and in the following section, insights related to these assumptions are presented.

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Insert Table II here – Philosophical Assumptions Interpreted in EE's Invisible College

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Findings – Assumptions in EE's Invisible College

EE's Invisible College was described by Loi *et al.* (2016), in terms of its 'polycentric' theoretical foundations, that is: five core themes revolving around introspection, entrepreneurial intentions, pedagogy, entrepreneurial learning and evaluation (Loi *et al.*, 2016, p. 962). However, to repeat, the ultimate interest lies *not* in the content and results of research, but in how making the very *pre-suppositions* (Alvesson and Sandberg, 2013) of research problematic, new thinking may be opened up and new conversations started. Therefore, the purpose of problematisation is not to find an answer to the question 'What are the philosophical foundations of EE's Invisible College?' but rather to ask 'What critical insight can we gain from exploring philosophical assumptions in EE's Invisible College?'

Whilst there is some diversity in methodology within the 44 articles – quantitative, qualitative, conceptual, empirical – the more *paradigmatic* assumptions are surprisingly similar and summarised in Table III. In terms of ontological assumptions (assumptions about the nature of reality), in EE's Invisible College, the use of scientific language and approach signpost an assumption that the social world can be treated as the natural world. Experimental approaches, systematic reviews and meta-analyses suggest that EE is a treatment which can be given to subjects and its effects accurately measured.

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Quantitative studies impress upon the reader how the use of control groups and the careful analysis of data will mean that results are unbiased and robust. This ethos dominates EE's Invisible College: experiments and quasi-experiments test hypotheses; predictions are proposed; characteristics are measured; control groups ensure validity; effects are calculated and analysis is undertaken in systematic and rigorous ways. Such language speaks to the idea that the social world is 'hard, real and external to the individual' (Burrell and Morgan, 1979, p. 2).

In terms of epistemological assumptions, about the nature of knowledge, research products in EE's Invisible College are inclined towards embodying objective epistemological assumptions, where knowledge is something pre-existing that can be extracted, through testing and deducing, as in the natural sciences. The articles are characterised through the pursuit of models, methods and measures and an assumption towards theory testing through a structured process of deductive methods with a view to establishing generalisable findings. Research products portray a stance where the researcher is an "independent observer, theorizer and predictor of behaviour", *absent in the text* (Cunliffe, 2011, p. 660), and research accounts are abstract and academic, often dealing with humans as objects (students, pupils, nascent entrepreneurs, graduates). The majority of articles imply that knowledge can be objectively accessed, and the default research posture is that personified by Merton (1938), when he characterised an ethos of science involving disinterested and sceptical scientific researchers searching for universal truths.

******Insert Table III - Summary of philosophical assumptions – around here.******

In comparing the articles, it was possible to find a small number of research products which offered some variation on this approach. Cope's (2003), qualitative study of the 'lived

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experience' of six practicing entrepreneurs, acknowledges the active role of the researcher in *co-constructing* knowledge and meaning. Cope (2011), also offers another alternative to natural science, with an interpretative phenomenological analysis involving 8 entrepreneurs reflecting on failure and illustrating how tightly bound the experience and understanding of the entrepreneurs was with the people around them (relatives, employees, spouses), and the pivotal role of the researcher in drawing out this experience. Such accounts illuminate the living conversations between researcher and the researched, and how relationships between people provide insights into how we relate to each other. Rae (2006), too offers an alternative approach, and out of the 44 articles, commits the most space to discussing assumptions underpinning the research. Rae uses a 'social constructionist methodology, making use of narrative and discourse analysis' and argues that this 'alternative and equally valid perspective to the entitative ontology' (Rae, 2006, p. 39). In exploring the 'lifeworld' of the entrepreneur Rae considers that: 'the 'voice of the entrepreneur, together with the interpretation of the researcher, are vital aspects of understanding the entrepreneurial experience' (Rae, 2006, p. 42). Like Cope, Rae, acknowledges the active role of the researcher as a crucial element in the co-construction of knowledge. They both create names and personas for the people in their studies and this position distinguishes their work from most other articles, though, Ravasi and Turati (2005), also humanise the participants in their comparative case study. It is interesting to note that the papers with more interpretative leanings, are about *entrepreneurial learning* rather than entrepreneurship education, making them outliers in EE's Invisible College. Remove them and the body of work becomes more philosophically consistent. Returning to this larger body of work, when considering the sociological assumptions that the underlying ontologies and epistemologies point to, EE's Invisible College is largely functionalist, where scientific method is used to quantify and analyse the existing social order but *does not* attempt to change it. This is the sociology of regulation, which presumes a status quo and considers

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human needs within the context of these existing social systems (Burrell and Morgan, 1979).

An alternative to this functionalist inclination is the sociology of radical change, where the system is not seen as satisfying needs, but as eroding possibilities for human fulfilment. It is concerned with conflict, change, contradiction and emancipation, ultimately, it is concerned with potentiality, not actuality – it seeks alternatives to the status quo. Whilst one paper explored social enterprise (Tracey and Phillips, 2007), a potentially radical subject matter, the research product is illustrative and analytical, as opposed to radical in the sense that it dealt with issues of power and domination. It has been noted that the appearance of seemingly unconventional voices can reproduce the status quo (Alvesson and Sandberg, 2013), if they give the appearance of progress whilst under the surface and deeper assumptions go unexamined.

It must be said, considering and comparing ontological assumptions in these interpretative (using participants viewpoints for understanding shared versions of reality), papers is challenging. In Rae's paper for example, a social constructionist methodological orientation might influence one towards interpreting that these epistemological assumptions are incompatible with ontological realism (which assumes mind independent social reality). Here, the complexities elaborated by Cunliffe (2011), about how ontologies are embodied in research products through linguistic and methodological choices become important in aiding comparisons. She explains that meta-theoretical assumptions blur and overlap, and when considering assumptions in research products the key is not to ask 'are these the right categories?' or 'who fits in each', but rather, 'which differences make a difference?' (Cunliffe, 2011, p. 20). In the case of Rae's paper, this prompted a delve into the work of social constuctionist Gergen (2001), who discusses that social construction is not just as way of viewing knowledge construction (between people), but, *ontologically* speaking, asks an entirely new set of questions relating to political, ideological and ethical aims. In addition, the

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work of Elder-Vass (2012), about realist social construction, was important in considering how social construction and realism are compatible. Thus, when comparing ontological assumptions, one is searching for signposts about the deep concerns and assumptions, *not just* about how knowledge is constructed.

Suffice to say, problematisation is an exercise in interpretation, its goal is to try to surface and question assumptions embodied in literature. It should be acknowledged that this is a subjective, sometimes complex activity, for which different authors with different experiences and a different research process may generate different insights. The process differs from, say, interviewing authors about the philosophical assumptions they were trying to embody and presenting unproblematic summaries of their views or intentions. It is important to acknowledge therefore, that an author might hold a different interpretation about their own assumptions than what is being articulated here, or indeed a reader of this paper might have a different view, based on their own interpretations of meta-theories, or particular perspectives they know, or even elements within that perspective that speak to them. Discussions about philosophical assumptions can get extremely detailed and nuanced, the purpose here is simply to *open up* these more paradigmatic assumptions for consideration by members of the EE research community.

Now meta-theoretical assumptions in EE's Invisible College have been compared, and challenges in relation to this process discussed, further intellectual resources offered by problematisation - (re)conceptualisation and making a reversal - are used to enable a reconsideration of this body of work.

(Re)conceptualisation – from Invisible College to Epistemic Bubble

A central ambition of problematisation is to generate re-conceptualisations of existing thinking that trigger new ideas and ways of thinking about existing phenomena (Alvesson and Sandberg,

2020). The (re)conceptualisation of subject matter is a useful step which can point towards a direction for further study but without prescribing a fixed outcome (Alvesson and Sandberg, 2013, p. 64). It involves suggesting an alternative way of thinking about a phenomenon which prompts people to reconsider what *they thought* they knew, for example that college dating is not about relationships and intimacy but about bragging rights and status (Abbott, 2004, p. 123).

The idea that the body of work identified by Loi *et al*. was said to represent EE's *Invisible College* is particularly thought provoking. An invisible college has been characterised as a scientific in-group (De Solla Price and Beaver,1966), a social structure of influence and communication (Crane, 1977), and a global collaborative network and knowledge 'market' which emerges from the choices of hundreds of individuals seeking to maximize their own welfare (Wagner, 2009). In an invisible college research results are discussed and colleagues play a role in constructing an 'international forum' by referring in their own work to earlier work of other scientists (Van Raan, 2005). In a reconsideration of co-citation analysis, Lievrouw (1989), points out that co-citations are made *by people*, but co-citation analysis often focusses on the end product (a map of connections between articles) rather than the *people* and *social processes* which might influence citing behaviour. Thus, a (re)conceptualisation might mean moving from a framing of EE's *Invisible College* as benign and ingenuous and as unproblematically revealing the traditions and collective logic of the field towards something more akin to an echo chamber or epistemic bubble, which encompasses the role of people and social processes. An echo chamber is a term derived from an acoustic chamber where sound reverberates. This analogy has been developed to describe the situation where the beliefs of a group of people (in real life or on-line), are strengthened through repetition (Sunstein, 2001). The impact of echo chambers has become a greater focus of research, because of their potential to effectively inure participants to the views of

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outsiders (Sunstein, 2001; Sunstein, 2018). Indeed, a quality of an echo chamber is that ones'

views are amplified and returned, and thus, they have the tendency to increase the strength of

one's *initial* view. An epistemic bubble (Nguyen, 2018), is a passive structure of omission

where a group doesn't have contact with other views and isn't exposed to alternative

arguments. A distinction between these two concepts is the relationship between insiders and

outsiders. In an echo chamber insiders are systematically brought to distrust outsiders and

there is an active structure of exclusion through discrediting; in an epistemic bubble the group

is caught in a poor information flow which filters out information and narrows focus along

institutional lines (Nguyen, 2018). Whether the philosophical assumptions discernible in EE's

Invisible College are more akin to an echo chamber or an epistemic bubble is a topic for

further exploration beyond the scope of this paper, but the spirt of either alternative analogy

is simply to draw attention to the idea that sameness can be re-conceptualised as active or

passive exclusion or omission by people and social processes, rather than esteemed tradition

and collective logic found in articles. This dynamic is implicit in the sub-title of the paper

which was the inspiration for this problematisation: 'The theoretical foundations of

entrepreneurship education: *How co-citations are shaping the field'* (Loi et al, 2016, p. 948,

emphasis added), which may prompt us to think through, as Lievrouw (1989), suggests we

should, that scientific development is made *by people*, who are influenced by the behaviour

of others to the extent that certain assumptions become seen as natural and alternative world

views may be either actively or passively omitted. Having (re)conceptualised EE's Invisible

College, in the following section, the 'making a reversal' heuristic is deployed.

Making a reversal – the philosophical homogeneity of heterogenous research

Making a reversal involves taking an opposite view of something that is perceived as

established fact, for example, claiming 'terrorism is good' because it unites people against

external threats and leads to extra funding sought by the military and police (Alvesson and

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Sandberg, 2013, p. 64). This 'reversal heuristic' (Abbott, 2004), is intended to open up new zones of investigation and possibilities of interpretation.

EE research has been described as highly fragmented because it lacks the strong theoretical trends and cumulative knowledge (Fayolle, 2013), and is fragmented conceptually and methodologically (Blenker *et al*., 2014). At the *surface* level of EE programmes and courses, there are numerous definitions, different objectives and purposes, different audiences from school children to practicing entrepreneurs, different content and teaching methods, different approaches to assess and evaluate. Whilst EE research might appear heterogenous at this surface level, diversity is less apparent when considering the philosophical assumptions underpinning EE's most co-cited literature. Indeed, at a *deeper*, philosophical level, the body of work studied was remarkably similar. With some notable expectations, EE's Invisible College is a place where ideas about an external social reality accessible to the dispassionate researcher are accepted, where assumptions about the possibility of objective knowledge and the superiority of scientific methodology dominate and where functionalist research products reproduce the social status quo. At a deep level, EE's Invisible College is, philosophically speaking, rather more homogeneous than heterogeneous.

Does this particular case of homogeneity matter? Does it matter if the social world is treated as the natural world and objective knowledge assumed as possible? Aren't these the values of high science to which the most esteemed literature in the field should aspire in order to be rigorous? To consider these questions, we put this pattern of objective paradigmatic assumptions 'into conversation' (Alvesson and Sandberg, 2013), with theorising which recognises the practical significance 'hidden systems of ideas' have on social action (Midgely, 1992).

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In a metaphor which aims to articulate its highly practical nature, philosophy was likened to plumbing by the philosopher Mary Midgely (1992): "Plumbing and philosophy are both activities that arise because elaborate cultures like ours have, beneath their surface, a fairly complex system which is usually unnoticed, but which sometimes goes wrong. In both cases, this can have serious consequences." (Midgely, 1992, p. 139).

Midgely described that when *the ideas* we live by function badly 'they do not usually drip through the ceiling audibly and swamp the kitchen floor' but are more like a *bad smell* or a *sense of cold* that creeps in gradually which will 'quietly distort and obstruct our thinking' (Midgely, 1992, p. 139). Midgely observed that 'We may indeed complain that life is going badly…' but that it can be hard to see why as it is 'notoriously difficult' to turn attention to what might be wrong with our ideas, and the very structure of our thought: 'Attention naturally flows outwards to what is wrong in the world around us' whereas, what is needed to 'bend thought round so that it looks critically at itself' (Midgely, 1992, p. 140).

We do not need to go too far in EE to hear colleagues articulating some cold creeping in. Concerns being expressed range from a lack of legitimacy and a lack of criticality in research to a taken-for-grantedness, and an exclusionary, environmentally and socially unsustainable potential in practice (Fayolle, 2013; Fayolle et al, 2016; Berglund and Verduijn, 2018, Hytti, 2018, Loi *et al.*, 2021). If these are the troubles and complaints observed at the surface level, Midgely would ask us to think about the 'hidden system of ideas' which underlies what we can see, that is: what problems there might be with the 'philosophical plumbing.' The objective, functionalist assumptions which underpins EE's Invisible College is such a hidden system of ideas. Thus, in the next section, we consider this particular case of philosophical plumbing and its implications.

Implications for research and research practice

Just as it has been argued that pedagogical practice is adopted more or less unconsciously by teachers, limiting what practice is possible (Fayolle et al, 2016), this logic also stands for how research is enacted and the assumptions that are seen as natural. Patterns underlying our thought are 'more powerful, more intricate and more dangerous than we usually notice' and need constant attention, for they have a strong grasp on our imagination (Midgely, 1992, p. 146). So, what are the implications of the homogenous objective and functionalist philosophical plumbing in EE's Invisible College? What's the problem with the idea that there is one, hard, external reality, accessible to a dispassionate researcher?

First, this rational and objective world view has been dismantled by different theoretical frameworks which signpost the importance of cultural, historical and social context, to the extent that it has been argued that findings (even those from natural science) are themselves social constructions and human interpretations (La Tour and Woolgar, 1979; Crotty, 1998; Johnson and Duberley, 1998; Fielding, 2009).

In addition, scientific approaches, philosophically focussed as they are on the measurable have been said to encourage under-theorization and emaciated explanation (Fleetwood, 2007). This can be seen in EE evaluation studies, such as a meta-analysis, where a statistical relationship is found between entrepreneurship education and training and the development of human capital, but authors say so little is known about the courses, course content or teaching methods that it is not possible to provide insight into what influences outcomes to happen (Martin *et al.*, 2013, p. 222). What is more, measurement focussed impact studies acknowledge that it is difficult to control for initial and unobservable differences between students (Peterman and Kennedy, 2003; Oosterbeek *et al.*, 2010), and that self-selection bias is an issue (Athayde, 2009).

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Such differences between students and their social circumstances are exactly the kind of contextual issues that might help researchers better *explain* EE and its effects for individuals and society, with appeals for the study of context appearing in research conference calls (RENT, 2021; 3e 2022). For, whilst empirical science focused only on the observable and measurable see context as a limitation, something to be minimised and statistically controlled, ontologically deep philosophies (Bhaskar, 1974; Pawson, 2013; Jagosh, 2019), see context as something which can be explored and learned from, used to open up what we know.

Furthermore, EE practice has been acknowledged as highly dynamic, where one is trying to understand the interplay of multiple social interactions, navigate complex environments, and revise strategies about how to turn ideas into action (Fayolle and Toutain, 2013). The relational and temporal elements of EE are crucial (Jones and Matlay, 2011), where learning and development is created *in events* and *between people* (Van de Ven, 2007). This social environment in which EE exists is one which holds rich, in-depth knowledge requiring researchers to adopt divergent ontological and epistemological positions and modes of inquiry which embrace the complexity of human practice (Easterby-Smith *et al.*, 2008; Gephart, 2004).

A final point: scientific truth claims are constructed around the idea that research holds a mirror up to a single, external reality (Rorty, 1979). But, given the functionalist inclinations of EE's Invisible College, what if the picture it reflects is a reality that many won't recognise? A picture where power, inequality and disadvantage - as illustrated by such authors as Foucault (1980), Habermas (1987) and Bourdieu (1989), and in relation to entrepreneurship (Blackburn and Ram, 2007; Martinez Dy, 2020) and entrepreneurship education itself (Brentnall *et al.*, 2018) - are rendered invisible. EE's legitimacy could be strengthened by more ethical and conscious (Fayolle *et al.*, 2016), and critical (Berglund and Verduijn, 2018), research, and a willingness to explore EE's dark side (Bandera *et al.*, 2020). New methods and out of the box thinking is

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needed to illuminate what is happening in EE practice (Fayolle, 2019), and to work 'with' context to support research development (Thomassen *et al.*, 2019).

As identified by Fayolle *et al.* (2016), it is through *sociological* works, that we explore how the normalisation of autonomy makes individuals more vulnerable, how important solidarity and cooperation are and about the stress induced consequences of excessive economic competition (Fayolle et *al*., 2016). Sociological studies have a pre-occupation for the role, function and impact of education for society (Béchard and Grégoire, 2005), and are thus crucial in understanding of the impact of EE on its ultimate client (society), which is necessary to strengthen the field's legitimacy (Fayolle, 2013). Thus, specifically adopting under-represented sociological paradigms may generate both new knowledge, as well as an alternative research stance which aims to interrupt ideological constraints and catalyse social change (Burrell and Morgan, 1979).

Such research goals align with ambitions for more inclusive, transformational, environmentally and socially sustainable EE (Hytti, 2018; Ratten and Jones, 2018; Neergard *et al*., 2020; Loi *et al*., 2021), indeed, it is difficult to envision how changes at the surface level, the practice level, are likely or possible without attending to the assumptions which underpin them in research. Without paying attention to the philosophical plumbing (Midgely, 1992), is it more likely to imagine a situation where we continue to notice the creeping cold, but we do not attend to the hidden system of ideas that keeps things the way they are. These issues demonstrate, as Midgely argued, that philosophy is not just grand and abstract, but practical and with serious consequences, particularly in the construction of knowledge, which is highly valued in society and where inherited values, ideas and conceptual schemes *seep in* to everyday thinking and common sense (Midgely, 1992).

We reflect that this dynamic – inherited values and ideas seeping into everyday thinking – can be identified in the process of developing this paper. Consider for a moment the research matrix presented in the Appendix and which provided the stimulus for the shared problematisation. It offers a lesson in how philosophies are unconsciously inherited and enacted. The initial collation and review of the articles was underpinned by a deep belief about what is acceptable research in EE. First, a lurking assumption about the superiority of quantifying a phenomenon may be discerned from choosing an approach to *count* philosophies. Second, the construction of a table, the selection and (re)presentation of certain information contributes to the *appearance* of systematisation, but in fact, it was a human, with all their personal inclinations and cognitive filters, who constructed it. Finally, concern regarding the likelihood of research being accepted at a conference or for publication, means that the expectations and style of ones' academic community and professional circumstances are omnipresent in the scholarly process. Not straying too far from inherited traditions and styles is considered pragmatically and in relation to professional and personal risk and opportunity.

Despite, or perhaps *because* of these tensions, and because the ultimate goal of problematisation is to construct new avenues for thinking and action (Alvesson and Sandberg, 2013), we conclude by posing three questions in relation to the implications of assumptions which underpin research practice. First, in relation to *the type of research* that is pursued and legitimised in the field of EE, we ask: how can alternative modes of inquiry be nurtured which exemplify diverse ways of doing research and better capture and reflect the complexity of EE practice? Connected to this, and in relation to *the socialisation of researchers* in the field, we ask: how could intentionally prioritising overlooked sociological issues prompt scholars to pursue research which might change the status quo, instead of analysing it? Finally, in relation to *the strengthening of criticality*, we ask: how can adopting alternative, ontologically deep

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philosophies open up, challenge and transform what we think we know about EE and its wider impact? Such questions illustrate that, far from philosophical assumptions being an abstract or unimportant concern, they have the power to constrain or empower social action and the impact of research.

Conclusion

The aim of this paper has been to energise discussion around the importance of philosophical assumptions in EE research and unsettle thinking about what assumptions appear normal and natural in research products. A paradigmatic body of work - EE's Invisible College - was the target for problematisation, because of its connected and influential quality, and articles being frequently cited together and still referenced today. These historically important and currently relevant articles were previously studied from a theoretical viewpoint, but this paper undertook to explore the body of work from a philosophical perspective. Pursuing this task from a problematising mode of inquiry offered the opportunity to think critically about the importance of philosophical assumptions, the patterns of assumptions that are inherited and the implications of these assumptions, particularly in relation to ambitions for EE to be more socially impactful. In developing this argument, EE's Invisible College was reconceptualised from a benign and ingenuous collective logic to an echo chamber or epistemic bubble to draw attention to the role of people and social processes in the co-citations and the construction of knowledge. In addition, the notion of fragmentation and heterogeneity in EE was reversed by drawing attention to the homogenous – objective and functionalist - philosophical assumptions in the majority of the research products compared. Within considering the implications of these assumptions, a connection was made between problems that are observed at surface level - from lack of legitimacy, criticality and the exclusionary, socially and environmentally problematic potential of EE - to the *hidden system of ideas* which lies beneath.

Having highlighted the potential problems of the deeper assumptions, questions were posed, and practical implications identified, in relation to pursuing alternative modes of inquiry, prompting interest in overlooked sociological issues and purposefully adopting ontologically deep philosophies open up, challenge and transform what we think we know about EE and its wider impact.

By putting philosophical assumptions into conversation with theorising which appreciates the *practical* importance of philosophy, new thinking is opened up regarding the significance of the ideas that seep into and influence everyday thinking and action. Midgely reminds us that when things go wrong at the surface we must dig into the 'the assumptions that we have inherited and have been brought up with' and 'we must restate those existing assumptions…so as the get our fingers on the source of the trouble' (Midgely, 1992, p. 140). This paper is a contribution to thinking through existing assumptions by paying attention to the philosophical plumbing that might, in EE, help reveal a source of the creeping cold noticed by authors who write about legitimacy and criticality, the taken-for-grantedness of the field and the necessity to ensure its positive social usefulness.

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Bibliography

Alvarez, S. A. and Barney, J. B. (2010), "Entrepreneurship and epistemology: The philosophical underpinnings of the study of entrepreneurial opportunities", *Academy of Management annals*, *4*(1), 557-583.

Alvesson, M. and Sandberg, J. (2013), *Constructing research questions: Doing interesting research*. London: Sage.

Alvesson, M., & Sandberg, J. (2020), "The problematizing review: A counterpoint to Elsbach and Van Knippenberg's argument for integrative reviews", *Journal of Management Studies*, *57*(6), 1290-1304.

Amit, R., Glosten, L., and Muller, E. (1993), "Challenges to theory development in entrepreneurship research", *Journal of Management studies*, *30*(5), 815-834.

Athayde, R. (2009), "Measuring enterprise potential in young people", *Entrepreneurship Theory and Practice* 33(2): 481-500.

Bakker, J. I. (2007), "Scientific networks and invisible colleges", *The Blackwell encyclopedia of sociology*.

Baron, R. A. (2006), "Opportunity recognition as pattern recognition: How entrepreneurs "connect the dots" to identify new business opportunities", *The Academy of Management Perspectives* 20(1): 104-119.

Béchard, J. P. and Grégoire, D. (2005), "Entrepreneurship education research revisited: The case of higher education", *Academy of Management Learning & Education* 4(1), 22-43.

Berglund, K., Hytti, U., and Verduijn, K. (2020), "Unsettling Entrepreneurship Education", *Entrepreneurship Education and Pedagogy*, *3*(3), 208–213.

Berglund, K. and Verduyn, K. (2018), *Revitalizing Entrepreneurship Education: Adopting a critical approach in the classroom*. Rethinking Entrepreneurship Research. Routledge.

Bhatia, A. K. and Levina, N. (2020), "Diverse Rationalities of Entrepreneurship Education: An Epistemic Stance Perspective", *Academy of Management Learning & Education*, *19*(3), 323-344.

Bingham, A. J., and Witkowsky, P. (2022), "Deductive and inductive approaches to qualitative data analysis", C. Vanover, P. Mihas, & J. Saldaña (Eds.), *Analyzing and interpreting qualitative data: After the interview*: SAGE.

Blenker, P., Trolle Elmholdt, S., Hedeboe Frederiksen, S., Korsgaard, S. and Wagner, K. (2014), "Methods in entrepreneurship education research: a review and integrative framework", *Education+ Training* 56(8/9): 697-715.

Bourdieu, P. (1989), "Social space and symbolic power", *Sociological Theory* 7(1): 14-25.

Brentnall, C., Rodríguez, I. D. and Culkin, N. (2018), "The contribution of realist evaluation to critical analysis of the effectiveness of entrepreneurship education competitions", *Industry and Higher Education*, *32*(6), 405-417.

Brush, C.G., Duhaime, I.M., Gartner, W.B., Stewart, A., Katz, J.A., Hitt, M.A., Alvarez, S.A., Meyer, G.D. and Venkataraman, S. (2003), "Doctoral education in the field of entrepreneurship", *Journal of Management* 29(3): 309-331.

Bruyat, C. and Julien, P. A. (2001), "Defining the field of research in entrepreneurship", *Journal of Business Venturing* 16(2): 165-180.

Burrell, G. and Morgan, G. (1979), *Sociological Paradigms and Organisational Analysis*, London: Heinemann. 21-37.

Chen, C. C., Greene, P. G. and Crick, A. (1998), "Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?", *Journal of Business Venturing* 13(4): 295-316.

Cope, J. (2003), "Entrepreneurial learning and critical reflection: Discontinuous events as triggers for 'higher-level' learning", *Management Learning* 34(4): 429-450.

Cope, J. (2005), "Toward a dynamic learning perspective of entrepreneurship", *Entrepreneurship Theory and Practice* 29(4): 373-397.

Cope, J. (2011), "Entrepreneurial learning from failure: An interpretative phenomenological analysis", *Journal of Business Venturing* 26(6): 604-623.

Crane, D. (1977), "Social structure in a group of scientists: a test of the "invisible college" hypothesis", In *Social networks* (pp. 161-178). Academic Press.

Crant, J. M. (1996), "The proactive personality scale as a predictor of entrepreneurial intentions", *Journal of Small Business Management* 34(3): 42-49.

Crotty, M. (1998), *The foundations of social research: Meaning and perspective in the research process*, London: Sage.

Cunliffe, A. L. (2011), "Crafting qualitative research: Morgan and Smircich 30 years on.", *Organizational Research Methods* 14(4): 647-673.

29

DeTienne, D. R. and Chandler, G. N. (2004), "Opportunity identification and its role in the entrepreneurial classroom: A pedagogical approach and empirical test", *Academy of Management Learning & Education* 3(3): 242-257.

De Solla Price, D. J. and Beaver, D. (1966), "Collaboration in an invisible college", *American Psychologist* 21(11): 1011-1018.

De Solla Price, D. J. (1963), *Little Science, Big Science*. New York Chichester, West Sussex: Columbia University Press, 1963.

Easterby-Smith, M., Golden-Biddle, K. and Locke, K. (2008), "Working with pluralism: Determining quality in qualitative research", *Organizational Research Methods* 11(3): 419-429.

Edelman, L. F., Manolova, T. S. and Brush, C. G. (2008), "Entrepreneurship education: Correspondence between practices of nascent entrepreneurs and textbook prescriptions for success", *Academy of Management Learning & Education* 7(1): 56-70.

Elder-Vass, D. (2012). *The reality of social construction*. Cambridge University Press.

Fayolle, A. (2013), "Personal views on the future of entrepreneurship education", *Entrepreneurship & Regional Development* 25(7-8): 692-701.

Fayolle, A. and Loi, M. (2018), "Enhancing entrepreneurship education and practice: Challenging taken for granted assumptions and dominant perspectives", *Journal of Management Inquiry* Developmental Conference and Dialogue Call for Papers, available at https://www.researchgate.net/publication/326624287_Journal_of_Management_Inquiry_Dev elopmental_Conference_and_Dialogue_Call_For_Papers_Enhancing_entrepreneurship_educ ation_research_and_practice_Challenging_taken-for-granted_assumptions_and_dominant_pe

Fayolle, A. and Toutain, O. (2013), "Four educational principles to rethink ethically entrepreneurship education", *Revista de Economía Mundial* [*Journal of World Economy*], 35: 165-176.

Fayolle, A., Verzat, C., and Wapshott, R. (2016), „In quest of legitimacy: The theoretical and methodological foundations of entrepreneurship education research", *International Small Business Journal* 34(7): 895-904.

Fielding, N. G. (2009), "Going out on a limb: Postmodernism and multiple method research", *Current Sociology* 57(3): 427-447.

Fiet, J. O. (2001) "The theoretical side of teaching entrepreneurship", *Journal of Business Venturing* 16(1): 1-24.

Foucault, M. (1980), *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*, trans. and ed. by Colin Gordon et al., (London, 1980).

Garud, R., Gehman, J., and Giuliani, A. P. (2018), "Why not take a performative approach to entrepreneurship?", *Journal of Business Venturing Insights*, *9*, 60-64.

Gartner, W. B., and Vesper, K. H. (1994), "Experiments in entrepreneurship education: successes and failures", *Journal of Business Venturing* 9(3): 179-187.

30

Gephart, R. P., Jr. (2004), "Qualitative Research and the Academy of Management Journal," *Academy of Management Journal* 47(4): 454-462.

Gergen, K. J. (2001), *Social construction in context*, Sage.

Gibb, A. (2002), "In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge", *International Journal of Management Reviews* 4(3): 233-269.

Habermas, J. (1987), *The Theory of Communicative Action: Lifeworld and Systems, a Critique of Functionalist Reason, Volume 2* (Vol. 2), Beacon Press.

Hannon, P. D. (2005), "Philosophies of enterprise and entrepreneurship education and challenges for higher education in the UK," *The International Journal of Entrepreneurship and Innovation* 6(2): 105-114.

Hanson, J., Hooley, T. and Cox, A. (2017), *Business games and enterprise competitions. What works?* London: The Careers & Enterprise Company.

Harrison, R. T., and Leitch, C. M. (2005), "Entrepreneurial learning: Researching the interface between learning and the entrepreneurial context", *Entrepreneurship Theory and Practice*, 29(4): 351-371.

Hmieleski, K. M., and Corbett, A. C. (2006), "Proclivity for improvisation as a predictor of entrepreneurial intentions", *Journal of Small Business Management* 44(1): 45-63.

Holcomb, T. R., Ireland, R. D., Holmes Jr, R. M., and Hitt, M. A. (2009), "Architecture of entrepreneurial learning: Exploring the link among heuristics, knowledge, and action", *Entrepreneurship Theory and Practice* 33(1): 167-192.

Honig, B. (2004), "Entrepreneurship education: Toward a model of contingency-based business planning", *Academy of Management Learning & Education*, 3(3), 258-273.

Hood, J. N., and Young, J. E. (1993), "Entrepreneurship's requisite areas of development: A survey of top executives in successful entrepreneurial firms", *Journal of Business Venturing* 8(2): 115-135.

Hughes, D., Mann, A., Barnes, S. A., Baldauf, B., and McKeown, R. (2016), *Careers education: International literature review.* Warwick Institute for Employer Research and Education and Employers Research, Warwick.

Hytti, U. (2018). Epilogue: Critical entrepreneurship education: a form of resistance to McEducation?. In *Revitalizing Entrepreneurship Education* (pp. 228-234). Routledge.

Jagosh, J. (2020), "Retroductive theorizing in Pawson and Tilley's applied scientific realism", *Journal of Critical Realism*, *19*(2), 121-130.

Johnson, P. and Duberley, J. (2000), *Understanding management research: An introduction to epistemology*. London: Sage.

Jones, C. and Matlay, H. (2011), "Understanding the heterogeneity of entrepreneurship education: going beyond Gartner", *Education+ Training* 53(8/9): 692-703.

Katz, J. A. (2003), "The chronology and intellectual trajectory of American entrepreneurship education: 1876–1999", *Journal of Business Venturing* 18(2): 283-300.

Katz, J. A. (2008), "Fully mature but not fully legitimate: A different perspective on the state of entrepreneurship education", *Journal of Small Business Management* 46(4): 550-566.

Keen, S. (2011), *Debunking economics: the naked emperor dethroned?*. Zed Books Ltd..

Kourilsky, M. L. and Walstad, W. B. (1998), "Entrepreneurship and female youth: Knowledge, attitudes, gender differences, and educational practices", *Journal of Business Venturing* 13(1):77-88.

Krueger, N. F., Reilly, M. D. and Carsrud, A. L. (2000), "Competing models of entrepreneurial intentions", Journal of Business Venturing 15(5): 411-432.

Kuratko, D. F. (2005), "The emergence of entrepreneurship education: Development, trends, and challenges", *Entrepreneurship Theory and Practice* 29(5): 577-598.

Latour, B. and Woolgar, S. (1986), *Laboratory Life: The Construction of Scientific Facts* (Vol. 80), Princeton University Press.

Lievrouw, L. A. (1989), "The invisible college reconsidered: Bibliometrics and the development of scientific communication theory", *Communication research*, *16*(5), 615-628.

Liñán, F., Rodríguez-Cohard, J. C. and Rueda-Cantuche, J. M. (2011), "Factors affecting entrepreneurial intention levels: a role for education", *International Entrepreneurship and Management Journal* 7(2): 195-218.

Loi, M., Castriotta, M. and Di Guardo, M. C. (2016), "The theoretical foundations of entrepreneurship education: How co-citations are shaping the field" *International Small Business Journal* 34(7): 948-971.

Lomas, R. (2009), *The Invisible College*. Random House.

Lybeck, J. A. (2011), *A global history of the financial crash of 2007–10*, Cambridge University Press.

Martin, B. C., McNally, J. J. and Kay, M. J. (2013), "Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes", *Journal of Business Venturing* 28(2): 211-224.

Martinez Dy, A. (2020), "Not all entrepreneurship is created equal: Theorising entrepreneurial disadvantage through social positionality", *European Management Review*, *17*(3), 687-699.

McGee, J. E., Peterson, M., Mueller, S. L. and Sequeira, J. M. (2009), "Entrepreneurial self-efficacy: refining the measure", *Entrepreneurship Theory and Practice* 33(4): 965-988.

Menary, R. (2007), "Writing as thinking", *Language sciences*, *29*(5), 621-632.

Merton, R. K. (1938), "Science and the social order", *Philosophy of Science* 5(3): 321-337.

Midgley, M. (1992), "Philosophical plumbing", *Royal Institute of Philosophy Supplements*, *33*, 139-151.

32

Neck, H. M. and Greene, P. G. (2011), "Entrepreneurship education: known worlds and new frontiers", *Journal of Small Business Management* 49(1): 55-70.

Neergard, H., Gartner, W. B., Hytti, U., Politis, D., and Rae, D. (2020), "Filling in the blanks:" black boxes" in enterprise/entrepreneurship education", *International Journal of Entrepreneurial Behaviour & Research*, *26*(5), 817-828.

Nguyen, C. (2018), "*Echo Chambers and Epistemic Bubbles*", Episteme, 1-21, Cambridge University Press.

Oosterbeek, H., Van Praag, M. and Ijsselstein, A. (2010), "The impact of entrepreneurship education on entrepreneurship skills and motivation", *European Economic Review* 54(3): 442-454.

Packard, M. D. (2017), "Where did interpretivism go in the theory of entrepreneurship?", *Journal of Business Venturing*, *32*(5), 536-549.

Parker, S. C. (2006), "Learning about the unknown: How fast do entrepreneurs adjust their beliefs?", *Journal of Business Venturing* 21(1): 1-26.

Peterman, N. E. and Kennedy, J. (2003), "Enterprise education: Influencing students' perceptions of entrepreneurship", *Entrepreneurship Theory and Practice* 28(2): 129-144.

Pittaway, L. (2005), "Philosophies in entrepreneurship: a focus on economic theories", *International Journal of Entrepreneurial Behavior & Research* 11(3): 201-221.

Pittaway, L., and Cope, J. (2007a), "Entrepreneurship education: a systematic review of the evidence", *International Small Business Journal* 25(5): 479-510.

Pittaway, L., and Cope, J. (2007b), "Simulating entrepreneurial learning: Integrating experiential and collaborative approaches to learning", *Management Learning*, 38(2): 211-233.

Pittaway, L. and Tunstall, R. (2015), "Is there still a heffalump in the room? Examining paradigms in historical entrepreneurship research", *Challenging Entrepreneurship Research (Routledge Rethinking Entrepreneurship Research),* Landstrom, H., Parhankangas, A., Fayolle, A. and Riot, P., Routledge, 173-209.

Politis, D. (2005), "The process of entrepreneurial learning: A conceptual framework", *Entrepreneurship Theory and Practice* 29(4): 399-424.

Quattrone, P., & Hopper, T. (2001), "What does organizational change mean? Speculations on a taken for granted category", *Management accounting research*, *12*(4), 403-435.

Rae, D. (2006), "Entrepreneurial learning: A conceptual framework for technology-based enterprise", *Technology Analysis & Strategic Management* 18(1): 39-56.

Rae, D. (2010), "Universities and enterprise education: responding to the challenges of the new era," *Journal of Small Business and Enterprise Development* 17(4): 591-606.

Rasmussen, E. A. and Sørheim, R. (2006), "Action-based entrepreneurship education", *Technovation*, 26(2): 185-194.

Ravasi, D. and Turati, C. (2005), "Exploring entrepreneurial learning: a comparative study of technology development projects", *Journal of Business Venturing* 20(1): 137-164.

Refai, D., Higgins, D. and Fayolle, A. (2017), Promoting Values through Sustainable Entrepreneurial Education – An Axiological perspective, paper presented at the Institute of Small Business and Entrepreneurship Conference (ISBE), 8th-9th November 2017, Belfast.

Ramoglou, S. and Tsang, E. W. (2017), "Accepting the unknowables of entrepreneurship and overcoming philosophical obstacles to scientific progress", *Journal of Business Venturing Insights*, *8*, 71-77.

Robinson, P. B. and Sexton, E. A. (1994), "The effect of education and experience on self-employment success", *Journal of Business Venturing* 9(2): 141-156.

Rorty, R. (1979), *Philosophy and the Mirror of Nature,* Princeton University Press.

Savage, M., (2015), *Social class in the 21st century,* (London, Penguin).

Shepherd, D. A. (2004), "Educating entrepreneurship students about emotion and learning from failure", *Academy of Management Learning & Education* 3(3): 274-287.

Souitaris, V., Zerbinati, S. and Al-Laham, A. (2007) "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources", *Journal of Business Venturing* 22(4): 566-591.

Sunstein, C. R. (2001), *Echo chambers: Bush v. Gore, impeachment, and beyond,* Princeton, NJ: Princeton University Press.

Sunstein, C. R. (2018) , *#Republic: Divided democracy in the age of social media*, Princeton University Press.

Tavory, I., & Timmermans, S. (2014), *Abductive analysis: Theorizing qualitative research*, University of Chicago Press.

Thrane, C. and Blenker, P. (2018), ""Who is an entrepreneur?" - the orphan in entrepreneurship education", paper presented at 3E ECSB Entrepreneurship Education Conference, 16th – 18th May 2018, Enschede, The Netherlands..

Thrane, C., Blenker, P., Korsgaard, S., and Neergaard, H. (2016) "The promise of entrepreneurship education: Reconceptualizing the individual–opportunity nexus as a conceptual framework for entrepreneurship education", *International Small Business Journal*, *34*(7), 905-924.

Tracey, P. and Phillips, N. (2007), "The distinctive challenge of educating social entrepreneurs: A postscript and rejoinder to the special issue on entrepreneurship education", *Academy of Management Learning & Education* 6(2): 264-271.

Tsang, E. W. (2021), "That's Interesting! A Flawed Article Has Influenced Generations of Management Researchers", *Journal of Management Inquiry*, 10564926211048708.

Van de Ven, A. H. (2007), *Engaged scholarship: A guide for organizational and social research*, Oxford University Press on Demand.

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van Raan, A. F. (2005), "Measurement of central aspects of scientific research: performance, interdisciplinarity, structure", *Measurement: Interdisciplinary Research and Perspectives* 3(1): 1-19.

Verduijn, K., and Berglund, K. (2019), "Pedagogical invention in entrepreneurship education: adopting a critical approach in the classroom," *International Journal of Entrepreneurial Behavior & Research*.

Vesper, K. H. and Gartner, W. B. (1997), "Measuring progress in entrepreneurship education", *Journal of Business Venturing* 12(5): 403-421.

Von Graevenitz, G., Harhoff, D. and Weber, R. (2010), "The effects of entrepreneurship education", *Journal of Economic Behavior & Organization* 76(1): 90-112.

Wagner, C. S. (2009), *The new invisible college: Science for development*, Brookings Institution Press.

Wilson, F., Kickul, J. and Marlino, D. (2007), "Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education", *Entrepreneurship Theory and Practice* 31(3): 387-406.

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Appendix – Philosophical Assumptions Interpreted in EE's Invisible College

Paper	Author (year of publication). Year of last citation/google scholar citations since 2017.	Research approach	Summary of article	Typical language	Ontological assumption	Knowledge Problematic	Paradigm
1	Kreuger *et al* (2000) Last cited 2021. / 3530.	Quantitative	A 'competing models approach' is utilised to compare two intentions based models using regression analysis on data from a sample of student subjects.	Predict - Robust - Generalizable - Validity - Testable - Model.	Realism	Objective	Functionalism
2	Chen *at al* (1998) Last cited 2021. / 1690.	Quantitative	Two studies (one with students, one with small business executives) were conducted to assess Entrepreneurial Self Efficacy scores.	Construct - Predict - Control - Variables - Model - Assess.	Realism	Objective	Functionalism
3	Katz (2003) Last cited 2021	Qualitative	A detailed chronology of entrepreneurship	Review - Discuss - Historical - Primary Sources -	Realism	Objective	Functionalism

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	/ 678		education in the United States.	Secondary Sources - Interviews			
4	Kuratko (2005) Last cited 2021 / 1580	Qualitative	Data from articles, courses and text is synthesised to present 'trends and challenges' in entrepreneurship education.	Sources - Commonalities - Perspective - Analysis - Trends - Findings	Realism	Objective	Functionalism
5	Peterman and Kennedy (2003) Last cited 2021 / 1140	Quantitative	Pre-test/post test control group design to test the effects of a Young Achievement programme on 117 students.	Effect - Empirical - Measure - Hypothesis - Control Group	Realism	Objective	Functionalism
6	Politis (2005) Last cited 2021 / 1680	Qualitative	A review and synthesis of available research to explain entrepreneurial learning as an experiential process.	Theoretical - Logic - Reasoning - Review - Synthesize - Proposition	Realism	Objective	Functionalism
7	Baron (2006) Last cited 2021 / 831	Qualitative	The paper argues that pattern recognition is a useful model for re-appraising	Framework - Evidence - Research - Models -	Realism	Objective	Functionalism

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			opportunity recognition.	Propositions - Perspective			
8	Souitaris *et al* (2007) Last cited 2021 / 1510	Quantitative	Pre-test and post-test quasi experimental design measuring the entrepreneurial attitudes and intentions of 250 students.	Test - Measure - Effect - Validity - Reliability - Variables	Realism	Objective	Functionalism
9	Cope (2005) Last cited 2021 / 658	Qualitative	Conceptual article which reviews and synthesises extant literature to develop a new framework on entrepreneurial learning.	Perspective - Theoretical - Conceptual - Empirical - Synthesize - Framework	Realism	Objective	Functionalism
10	Robinson and Sexton (1994) Last cited 2021 / 381	Quantitative	An empirical study using US census data on self employment to assess the effect of education and experience on self-employment success.	Hypothesis - Empirical - Effect - Regression - Causation	Realism	Objective	Functionalism

11	Wilson *et al* (2007) Last cited 2021 / 1350	Quantitative	An analysis of the relationships between gender, entrepreneurial self-efficacy, and entrepreneurial intention, using a sample of students from 7 graduate programmes in the US.	Data - Test - Hypothesis - Effect - Measure – Scale	Realism	Objective	Functionalism
12	Cope (2003) Last cited 2021 / 348	Qualitative	Qualitative case study research into the 'lived experience' of six practising entrepreneurs using interviews and story logs.	Technique - Personal Representation - Sense Making - Meaning - Case	Realism	Intersubjective	Interpretative
13	Honig (2004) Last cited 2021 / 533	Qualitative	A conceptual piece discussing the historical and theoretical underpinnings of business plan competitions and comparing three pedagogical models.	Paradigm - Evaluating - Systematically - Impact - Model – Finding	Realism	Objective	Functionalism

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14	Crant (1996) Last cited 2021 / 710	Quantitative	A study investigating the relationship between pro-active personality and entrepreneurial intentions.	Scale - Measure - Variables - Correlations - Variance - Empirical	Realism	Objective	Functionalism
15	DeTienne and Chandler (2004) Last cited 2021 / 358	Quantitative	An empirical test of a pedagogical approach to develop opportunity identification.	Empirical - Test - Experiment - Inventory - Hypothesis - Effects	Realism	Objective	Functionalism
16	Vesper and Gartner (1997) Last cited in 2021 / 282	Quantitative and Qualitative	A mail survey of 311 Deans of Business Schools to rank entrepreneurship programmes and surface evaluation criteria dilemmas.	Survey - Measure - Rank - Criteria - Evaluators - Comparison	Realism	Objective	Functionalism
17	Shepherd (2004) Last cited in 2021 / 229	Qualitative	The author describes pedagogical changes which aim to help students learn from failure. The challenges of measuring impact of such changes is discussed and a 'pre,	Theories - Pedagogies - Measuring - Testing - Competency - Scale	Realism	Objective	Functionalism

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			post and then' test described.				
18	Gibb (2002) Last cited in 2021 / 542	Qualitative	The author argues for a new approach to the study of entrepreneurship and a new paradigm as a basis for entrepreneurship education.	Review - Synthesize - Conceptual - Framework - Ontological - Epistemological	Realism	Objective	Functionalism
19	Kourilsky and Walstead (1998) Last cited in 2021 / 298	Quantitative	The study investigates Gallup poll data from 1000 14-19 year olds to explore gender similarities and differences in relation to attitudes to entrepreneurship.	Survey - Statistical - Reliability - Validity - Logistic Regression Analysis - Random Sample - Significant	Realism	Objective	Functionalism
20	Harrison and Leitch (2005) Last cited in 2021 /190	Qualitative	The authors review the development of the field of entrepreneurship as a context for the emergence of	Review - Summarize - Theoretical - Conceptual -	Realism	Objective	Functionalism

			learning as an area of scholarly attention.	Systematic - Conclude			
21	Pittaway and Cope (2007a) Last cited 2021 / 1010	Quantitative and Qualitative	A systematic literature review was undertaken, drawing form a range of disciplines via detailed search criteria. Nine themes are identified and discussed.	Systematic - Review - Empirical - Evidence Based Policy - Results - Conclude	Realism	Objective	Functionalism
22	McGee et al (2009) Last cited 2021 / 925	Quantitative	The article describes, within a new venture creation process framework, the development and testing of a multi-dimensional Entrepreneurial Self Efficacy instrument.	Model - Framework - Instrument - Standardization - Variable - Reliability	Realism	Objective	Functionalism
23	Ravasi and Turati (2005) Last cited 2021 / 122	Qualitative	A qualitative comparative case study method is used to analyse two development processes, in the same	Comparative - Model - Theory - Evidence - Actors - Variable - Interpretative	Realism	Objective	Interpretative

				organisation, at the same time.			
24	Brush *et al* (2003) Last cited 2021 / 104	Quantitative and Qualitative	A task force team draws on survey data from business school deans and entrepreneurship scholars to understand perspectives and attitudes towards entrepreneurship and doctoral education.	Survey - Philosophy - Observations - Process - Questions - Recommendations	Realism	Objective	Functionalism
25	Oosterbeek *et al* (2010) Last cited 2021 / 1080	Quantitative	The paper analyses the impact of a leading entrepreneurship programme on students skills and motivation using an instrumental variability approach in a difference in difference framework.	Impact - Evaluation - Treated - Untreated - Variables - Control - Measure – Unbiased	Realism	Objective	Functionalism

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26	Tracey and Phillips (2007) Last cited 2021 / 276	Qualitative	The article discusses social entrepreneurs and outlines the distinct challenges and issues involving in teaching and developing entrepreneurs who combine social and commercial objectives.	Consider - Outline - Rejoinder - Illustrate - Examples - Analysis	Realism	Objective	Functionalism
27	Rasmussen and Sorheim (2006) Last cited 2021 / 477	Qualitative	The article presents a number of action based activities at five Swedish Universities, captured via 1 day visits and semi structured interviews with managers, faculty staff, coordinators etc.	Present - Explore - Analyse - Empirical - Cases	Realism	Objective	Functionalism
28	Holcomb *et al* (2009) Last cited in 2021 / 216	Qualitative	The paper extends existing theories of entrepreneurial learning by explaining links between heuristics,	Theories - Conceptual - Consider - Model - Knowledge – Proposition	Realism	Objective	Functionalism

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			knowledge and action.				
29	Fiet (2001) Last cited in 2021 / 323	Qualitative	The article reviews the results of a survey of the entrepreneurship courses taught by participants at an entrepreneurship retreat. Suggestions on how scholars can develop and teach cumulative theory are offered	Debate - Assumptions - Theoretical - Pedagogical - Analysis - Cumulative Theory	Realism	Objective	Functionalism
30	Hood and Young (1993) Last cited in 2021 / 84	Quantitative and Qualitative	A survey of 100 leading entrepreneurs and CEOs is used to develop a theoretical framework suggesting four primary areas in which successful entrepreneurs must be developed.	Survey - Study - Systematically - Analyse - Theoretical – Results	Realism	Objective	Functionalism
31	Hmieleski and Corbett (2006) Last cited in 2021	Quantitative	The study investigates examines the relationship between	Study - Instrument - Dependent Measure -	Realism	Objective	Functionalism

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	/ 283		improvisation and entrepreneurial intentions using a sample of 430 college students.	Variable - Difference – Findings			
32	Gartner and Vesper (1994) Last cited 2021 / 144	Quantitative and Qualitative	The article uses information volunteered by teachers about pedagogical experiments to identify issues identified as important by the authors.	Survey - Analyses - Descriptions - Evaluation - Discusses - Findings	Realism	Objective	Functionalism
33	Neck and Greene (2011) Last cited 2021 / 889	Qualitative	The article introduces a 'new frontier' in entrepreneurship education: teaching entrepreneurship as a method.	Introduce - Explore - Discuss - Present - Advance - Overarching Framework – Advocate	Realism	Objective	Functionalism
34	Von Graevenitz (2010) Last cited 2021 / 610	Quantitative	The article describes a study where 196 students on a compulsory business planning course completed surveys to	Effects - Test - Hypothesis - Variables - Standard Deviation – Robust	Realism	Objective	Functionalism

				measure their entrepreneurial intentions before and after the intervention.				
	35	Katz (2008) Last cited 2021 / 117	Qualitative	The article uses 'benchmarks in the development of a field' to argue that entrepreneurship/small business can be characterized as a fully mature, but partially legitimate field.	Demonstrate - Support - Evidence - Analyse - Data - Consequences	Realism	Objective	Functionalism
	36	Edelman *et al* (2008) Last cited 2021 / 167	Qualitative	The article compares start up activities of entrepreneurs with data collected from entrepreneurship text books to identify overlap and differences between recommended and practiced activities.	Examine - Explore - Compare - Systematically - Content Perspective – Implications	Realism	Objective	Functionalism

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37	Parker (2006) Last cited 2021 / 106	Quantitative	The paper seeks to measure the extent to which entrepreneurs adjust their beliefs in light of new information. A sample of 700 self employed Britons was used to build a model.	Measure - Model - Linear Utility Function - Observable Characteristics - Theoretical Robustness	Realism	Objective	Functionalism
38	Bechard and Gregoire (2005) Last cited 2021 / 282	Quantitative and Qualitative	The article describes a content analysis of 103 peer reviewed entrepreneurship education articles through the prism of Bertrand's (1995) Contemporary Theories and Practice.	Empirical - Analytical - Systematically - Typologies - Classification - Peer Reviewed	Realism	Objective	Functionalism
39	Rae (2006) Last cited 2021 / 116	Qualitative	The paper explores a qualitative study on how entrepreneurial behaviours are learned and develops a conceptual framework.	Social constructionist - Discourse Analysis - Sense Making - Meaning – Ontology	Realism	Intersubjective	Interpretative

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40	Pittaway and Cope (2007b) Last cited 2021 / 338	Quantitative and Qualitative	The article describes research which explored 64 students reflections on 15 group venture planning projects.	Theorising - Argument - Conceptual - Framework - Narrative Coding – Evaluated	Realism	Objective	Interpretative
41	Cope (2011) Last cited 2021 / 726	Qualitative	The article describes a novel interpretative phenomenological analysis of the process and content dimensions of learning from failure.	Phenomenological - Meaning - Situated Insights - Rich Details - Thick Descriptions - Sense Making	Realism	Intersubjective	Interpretative
42	Athayde (2009) Last cited 2021 / 310	Quantitative	A research instrument was designed to measure enterprise potential in young people. A control group cross sectional design was used to investigate the impact of participation in a YE Company Programme.	Instrument - Measure - Impact - Control Group - Reliability – Validity	Realism	Objective	Functionalism
43	Linan et al (2010) Last cited 2021 / 801	Quantitative	The paper describes a study to investigate the influence of different factors	Empirical - Instrument - Statistical -	Realism	Objective	Functionalism

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				effecting entrepreneurial intention.	Factor Regression – Results		
44	Martin *et al* (2013) Last cited 2021 / 1030	Quantitative	A meta analysis of entrepreneurship education literature is conducted to examine outcomes in relation to human capital assets.	Quantitative Review - Hypothesis - Moderator - Correlations - Methodological - Calculated	Realism	Objective	Functionalism

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Assumption	Key elements of meta-theoretical stance used to (re)consider philosophical assumptions	Language
Ontological assumptions about nature of social reality (Johnson and Duberley, 2000).	Ontological assumptions (beliefs about the nature of social reality) are presented as on opposing ends of an objectivist/subjectivist continuum where the objectivist view is that social reality exists independent of human consciousness and cognitions (**Realism**) and the subjectivist view is that reality is simply a product of our minds with no independent status (**Nominalism**).	What assumptions are indicated by the deployment of language? How does the language that authors use to construct their research accounts reveal certain ontological and epistemological assumptions? (Cunliffe, 2011, pp. 659 – 665).
Epistemological assumptions about the nature of knowledge (Cunliffe, 2011).	Epistemological assumptions are presented as being on a fluid and dynamic continuum which includes subjective, objective and inter-subjective 'knowledge problematics' (as opposed to neat categories). **Subjectivism** – Common sense knowledge – naturally occurring actions, interactions, conversations. Non-replicable knowledge, situated validity. Macro and micro level focus. Researcher embedded in the world, shaped by (and shapes) experiences and accounts, mediates meanings of actors. Experience in the world. Researcher as outsider or insider. **Objectivism** – Replicable or shareable knowledge leading to the accumulation of knowledge. Knowledge and researcher are separate from the world. Researcher observes, discovers facts and develops predictive theories. Often Macro level focus. **Intersubjectivism** – In-situ, knowing-from-within. Transitory understandings and 'withness' thinking. Micro level focus. Research as embedded and embodied, as a dialectical interplay between research participants. Focusses on experiences between people. Embodied and embedded researcher.	
Sociological assumptions about the nature of society (Burrell and Morgan, 1979).	Four paradigms describe different orientations towards research: **Functionalism** - aim is to use scientific method to analyse society and its institutions and contribute to an ordered status quo. **Interpretative** – aim is to use participants viewpoints used to understand shared versions of reality. **Radical Humanism** – aim is to release people from socially constructed realities and ideological constraints by developing alternatives. **Radical Structuralism** – aim is to analyse dominating and exploitative organisations and processes.	

Table I – Meta-theories used to surface philosophical assumptions

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Author (year of publication).	Last citation/ cites since 2017.	Research approach	Summary of article	Signposting Language	Ontological assumption	Knowledge Problematic	Paradigm
Kreuger *et al* (2000)	Last cited 2021. / 3530.	Quantitative	A 'competing models approach' is utilised to compare two intentions based models using regression analysis on data from a sample of student subjects.	Predict Robust Generalizable Validity Testable Model	Realism	Objective	Functionalism
Katz (2003)	Last cited 2021 / 678	Qualitative	A detailed chronology of entrepreneurship education in the United States.	Review Historical Primary Sources Secondary Sources Interviews	Realism	Objective	Functionalism
Peterman and Kennedy (2003)	Last cited 2021 / 1140	Quantitative	Pre-test/post test control group design to test the effects of a Young Achievement programme on 117 students.	Effect Empirical Measure Hypothesis Control Group	Realism	Objective	Functionalism
Cope (2003)	Last cited 2021 / 348	Qualitative	Qualitative case study research into the 'lived experience' of six practising entrepreneurs using interviews and story logs.	Personal Representation Sense Making Meaning Stories Case	Realism	Intersubjective	Interpretative
Rae (2006)	Last cited 2021 / 116	Qualitative	The paper explores a qualitative study on how entrepreneurial behaviours are learned and develops a conceptual framework.	Social constructionist Discourse Analysis Sense Making Meaning Ontology	Realism	Intersubjective	Interpretative
Martin *et al* (2013)	Last cited 2021 / 1030	Quantitative	A meta-analysis of entrepreneurship education literature is conducted to examine outcomes in relation to human capital assets.	Quantitative Review Hypothesis Moderator Correlations Calculated	Realism	Objective	Functionalism

Table II - Philosophical Assumptions Interpreted in EE's Invisible College

Philosophical Dimension	Assumptions Interpreted
Ontology	Realism – 44 Nominalism - 0
Knowledge Problematic	Objective – 41 Subjective – 0 Intersubjective - 3
Sociological Paradigm	Functionalism – 39 Interpretative – 5 Radical Humanism – 0 Radical Structuralism - 0

Table III – Summary of philosophical assumptions