



## Rethinking reflective practice: John Boyd's OODA loop as an alternative to Kolb

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### ABSTRACT

The world is changing and business schools are struggling to keep up. Theories of reflective practice developed by the likes of Schon (1983), Gibbs (1988), Driscoll (1994, 2007) and Kolb (1984, 2015) are outdated and unfit for current purposes. Problems include the chronology of events, the orientation of the observer, the impact of external inputs, and the fact that neither education nor the workplace follow a structured, linear path.

In response to these challenges, we propose a new 'solution': John Boyd's OODA loop. We argue that OODA loops offer the chance to reshape reflective practice and work-based learning for a world in which individuals must cope with 'an unfolding evolving reality that is uncertain, ever changing and unpredictable' (Boyd, 1995, slide 1). By embracing the philosophy of John Boyd and his OODA loop theory, business schools can develop greater resilience and employability in graduates, preparing them to embrace change while also embedding the concept of life-long learning to make them better equipped to face the uncertainty that the modern world brings.

The concept of 'reflective practice' has been in common use for almost a century, with Dewey (1933) among the first to identify reflection as a specific way of thinking about the world – a way of thinking in and of itself. While Dewey's concept was a marked departure from previous ways of thinking about learning, it wasn't until the 1980s that the concept really started to gather momentum, with the works of Schon (1983) and Kolb (1984) among the two most prominent theories to arise in this period. These theories were followed by Gibbs (1988), and later the likes of Driscoll (1994, 2007), Raelin (2008) and Jasper (2013) who each conceptualised their own ways of understanding reflection in learning. Other notable works include Burgoyne and Reynolds (1997), Reynolds (1998) and Reynolds and Vince (2004, 2007).

However, while there are certainly a broad range of theories on reflective practice, no single dominant theory has emerged. While we strive for our theories to be as effective, applicable and generalisable as possible, few are ever perfect. Even Kolb's Experiential Learning Cycle – the 'most famous manifestation' of experiential learning (Tomkins & Ulus, 2016, p. 160) – is beset with problems that limit its applications, both in the workplace, and in an educational setting. These problems include the chronology of events, the orientation of the observer, and the fact that any or all stages in a cycle could occur at the same time. Adaptations have been proposed to Kolb's model, such as the scaffolding applied to the model by Wright et al. (2018) in an attempt to address the shadow side of reflective practice, but these have not been adopted widely. There are also several challenges posed by Kolb's more recent re-framing of the cycle as a 'spiral' (2015, p. 104), which he likens to a shell (p. 107). This shell comparison suggests that both learning and reflection follow a structured, linear path through time and space, in which recursive intent ultimately leads to continuous repetition of

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ineffective learning practices.

This poses a major challenge for management education. This is because the modern world does not work in linear, structured pattern and Kolb's model simply does not allow for continuous external inputs which *should* lead to a change of direction, but often don't. A more authentic management learning experience should therefore seek to foreground the uncertainties that permeate every aspect of management practice and indeed, daily life (Bureau & Komporozos-Athanasidou, 2017).

Kolb's misapprehension is part of a much bigger problem, one highlighted by the UK Government Office for Science, which notes how the pedagogies underpinning work-based and management learning are dominated by the 'acquisition' model of skill formation (Felstead & Unwin, 2016). While the acquisition model readily captures skills acquired through formal education pathways and training programmes, it also suggests that the formal qualification is the endpoint in learning, and the most important aspect.

One of the main issues with the acquisition model is that it fails to capture the 'soft skills' and experiences that are critical to success in any workplace. Yet despite these obvious weaknesses, the acquisition model of learning is widely adopted within universities and other educational settings. By embracing this model, there is a distinct danger that we are failing to equip users with the sort of mindset to adapt to a rapidly changing workplace – a workplace that in the twenty-first century often has no clear progression pathway, no formalised structure, and no defined endpoint. This is a particular challenge in light of the fourth industrial revolution, where disruptive technologies and trends are challenging formal modes of learning and changing the way we all live and work. We therefore agree with scholars who have suggested that business and management education must transform itself (Graduate Management Admission Council, 2013; Perusso & Baaken, 2020; Tourish, 2019, 2020).

In response to these challenges, we propose an overlooked approach in management learning – John Boyd's OODA loop. We argue that OODA loops offer the chance to reshape reflective practice and management learning for a world in which both individuals and organisations must cope with ever-increasing uncertainty and change. In so doing, we build on the foundational works of Schon et al. alongside more recent developments around the role of collective learning in reflective practice (Déa Roglio & Light, 2009; Yeo, 2013), and modern pedagogies proposed by the likes of Biggs and Tang (2011), Laurillard (2012) and Ashwin (2020). As such, this paper proposes a new pedagogical approach for higher education using OODA loops as an approach for developing critical self-reflection, resilience and ultimately, employability in graduates, equipping them to embrace change while also embedding the concept of life-long learning to make them better equipped to face the uncertainty that the modern world brings.

## 1. Re-thinking reflective practice

While Dewey (1933) is often regarded as one of the founding fathers of reflective practice, our modern understanding of the concept has its roots with Donald Schon's *The Reflective Practitioner: How Professionals Think in Action* (1983). This work responds to the crisis of 'professionalism' following the Vietnam War (p. 13), and the lack of public confidence in so-called experts. In response to this crisis, Schon attempts to re-establish the credentials of the technical expert through a model of reflection-in-action: a process of appreciation, action and reappraisal (p. 156), in which professionals build up a bank of 'examples, images, understandings, and actions' (p. 163) on which to build their expertise. The crux of Schon's argument is the need to 'see unfamiliar situations as familiar ones, and to do in the former as we have done in the latter' (p. 165) – or in other words, to apply lessons from the past to experiences of the present. Of course, this reflection-in-action concept is not without its critics, including the likes of Eraut (2004) and Boud and Walker (1998). Most relevant perhaps is that of Greenwood (1993), who notes the important role of reflection-*before*-action – an unspoken element in any process of reflection which Schon's original work seems to ignore.

While there are clearly some issues with Schon's approach, his work served to lay the groundwork for many of the theories that have followed. Not least because it played a critical role in raising the profile of reflective practice and putting it on the 'professional agenda' as something practitioners should engage in to get better at what they do. In this way, Schon's work is an important antecedent for the work of David Kolb, whose four-stage Experiential Learning Cycle (1984, 2015) is among the most influential approaches to learning, and is a staple of business school teaching on reflective practice.

In its modern form, Kolb's Experiential Learning Cycle comprises four elements: Concrete Experience, Reflective Observation, Abstract Conceptualisation and Active Experimentation (2015, p. 93). Or, more simply: something happens; we reflect on our observations; form an abstract concept around what happened; and experiment with our concept in the real world. While the cycle certainly seems to make some intuitive sense in terms of how we deal with an experience, it is arguably far too simplistic to represent the complexities of the modern world. It also fails to capture the importance of observation, and the ability (or not) of the participant to actively shape the world they inhabit. There is also then some question around the relationship between each individual cycle and each new lived experience. How does one cycle feed into another? How does 'Active Experimentation' work in practice? What does it mean for the other three elements of the cycle?

While Kolb's theory has gained significant traction in management circles – in part thanks to its simplicity and ease of use – its simplicity is also its biggest weakness as arguably the cycle only works in abstract isolation. This has led critics such as Seaman (2008) to propose that cyclic models such as Kolb's might be better viewed for their historical contribution to the field of reflective practice, rather than active (and we must assume, 'relevant') theories of learning. Meanwhile, adaptations to Kolb's model have been proposed to make it fit contemporary experience more effectively (Wright et al., 2018), though even these adaptations do not solve all of the fundamental problems inherent in the cycle itself. In short, Kolb's cycles gives us a way of thinking about reflection, but doesn't tell us what we should do – in this way it is not an 'active' theory as such, and does not equip practitioners with a mindset to adapt and change to the modern world of work.

### 1.1. The problem with spirals

In the second edition of *Experiential Learning* (2015), Kolb uses the concept of the spiral to respond to some of the criticisms that followed the publication of the first edition (1984). In a much-expanded section on the learning cycle, he says ‘The learning cycle, of course, is not a circle but a spiral where, as T.S. Eliot reminds us, we return again to the experience and know it anew in a continuous recursive spiral of learning’ (2015, p. 104).

However, one of the key issues with Kolb’s spiral concept is that it implies a self-referential journey of symmetry that follows a naturally derived mathematical pattern. This may well have been the case many decades ago, pre-internet and pre-globalisation, but paths through careers simply do not follow a linear trajectory and our reflections must constantly change through time. As such, we do not necessarily stay on the same spiral, and as we grow ourselves, so the way we interpret the spiral will also change; our reflection over time does not follow a linear path through time and space.

To ground his revised concept in the real world Kolb suggests readers think of the spiral in a similar way to a shell, which he claims reflects an organism’s learning and development – ‘The Life Spiral of a Shell’ (Kolb, 2015, p. 106). In this way at least, Kolb has a point: shells *do* reflect the life course of an organism – but only for those creatures that grow their own shells. Of course, what Kolb neglects in his analysis is the fact that shells get bigger over time. Thus, as we develop, so our reflective cycle *gets bigger* over time (not smaller), and therefore becomes *more difficult to manage*, not less. In part, the difficulty of managing a reflective cycle is explored through recent work on the ‘shadow’ side of experiential learning (Edelson et al., 2019; Wright et al., 2018) where ways of improving pedagogy and increasing the systems-thinking skills of learners are grappled with in light of existing models of reflective practice. However, a more radical rethink is required to facilitate the management of ever-increasing inputs into the reflective learning process.

Another issue with the shell concept is that it implies we will only have a single shell throughout the course of our lives, and that our lives (our shells) will grow and develop in a linear way. It is quite pertinent then to note that many snails will inevitably *die* should they ever be torn away from the shells to which they are attached. This observation is quite apt if we come to think about the world of work and the changing circumstances engendered by the fourth industrial revolution. In this day and age, most workers are not fortunate enough to have a job for life, and so sticking to a single shell will inevitably lead to ‘career death’ in much the same way as the humble snail will die should its shell ever be destroyed.<sup>1</sup>

Clearly, Kolb’s Experiential Learning Cycle is not ideally suited to the modern world, and neither the author’s later additions, nor the adjustments of other authors solve its fundamental flaws. At its heart, the Experiential Learning Cycle is far too simplistic a model and is not sufficient for a world full of disruptive technologies, new ways of working, and new ways of thinking about ourselves and the way we are oriented with the world. What is needed then is a model that has adaptability at its very core – a model that grows with the practitioner and the changing world alike – a model that never ends and is applicable both on tactical day-to-day level, and at a strategic level; that can be applied equally well to individuals, and the organisations that they work in.

Quite simply, we need to tear up the rulebook and start again.

### 1.2. Other models of reflective practice

Following the seminal publications by Schon and Kolb in the 1980s, there have been several further developments in our understanding of reflective learning. While this paper is not intended as a history of reflective learning cycles, some of the key developments in more recent years include Gibbs (1988), Driscoll (1994), Raelin (2008), Rolfe et al. (2011), and Jasper (2013). While some of these, such as Raelin (2008), offer a generalised approach to reflective practice and work-based learning, others, such as Rolfe et al. (2011) and Jasper (2013), focus specifically on applications in healthcare, a field where reflective practice is perhaps most readily and most often applied.

In *Learning by Doing* (1988), Gibbs proposes a reflective learning cycle that poses questions of the practitioner to help them reflect *after* the event (not during). This process encompasses six stages: Description, Feelings, Evaluation, Analysis, Conclusion, and Action Plan. While the cycle is quite useful for the fact it encourages reflection at each stage of the process, it arguably promotes description and doesn’t consider context. The Action Plan element is also designed with the notion that another similar event might occur again in the future. It therefore doesn’t encourage critical applications beyond the scope of the event; nor does it build reflection into the process of ‘doing’ itself.

A more useful model perhaps is Driscoll’s ‘What? Model of Structured Reflection’ (1994), based loosely (and apparently unknowingly: see Driscoll, 2007, pp. 43–44) on Borton’s (1970) three stage approach of ‘What?’, ‘So what?’ and ‘Now what?’. Driscoll’s slightly more detailed take on Borton’s concept certainly offers a much more useful way to think about reflection, and while it may superficially at least appear similar to Gibbs’s cycle, is crucially different in the way that it shows how learning from one experience can feed into many other different experiences in the future, highlighting the importance of synthesis.

This is a concept that Raelin draws upon in *Work-Based Learning: Bridging Knowledge and Action in the Workplace* (2008). While the work itself is quite theoretical and somewhat abstract in nature, Raelin makes a strong case for dividing modes of learning between theory and practice, and then dividing forms of knowledge between the explicit and the tacit. In so doing, he proposes two separate models for individual-level and collective-level learning (pp. 70–77), before proposing what he describes as a ‘Comprehensive Model of

<sup>1</sup> In this case, a *hermit crab* is a much better metaphor for the world of work than the Life Spiral of a Shell that Kolb suggests – even if the shell metaphor itself is far from ideal. A hermit crab will go through many different shells in a lifetime, and while it may not grow shells itself, will be ready and willing to exchange shells at a moment’s notice should the right opportunity present itself.

Work-based Learning' that merges the two tables together into a pyramid-like structure that seeks to integrate different styles of learning and reflection that cannot be rigidly classified (p. 79). Although the model itself was first proposed by Raelin in a paper for *Organisation Science* in 1997, writing more than a decade later Raelin (2008) insists on the continued applicability of the model. While Raelin's model certainly offers a useful way to think about *learning*, and the way we categorise what we learn and how we do it, the model doesn't offer the practitioner an easy way to think about the *process* of learning and reflection. Rather, Raelin's model offers an abstract conception of learning at a strategic, meta level, without the necessary grounding in the day-to-day.

As one might expect then, a more practical approach can be found in the healthcare sector – perhaps the most common setting in which reflective practice theories are regularly applied. Moving on from Raelin, Rolfe et al. (2011) propose a return to the 'What' based model initially put forward by Borton, with the three stages of 'What', 'So what ...' and 'Now what ...' to represent descriptive-level reflection, theory-and-knowledge-building reflection, and action-oriented reflection respectively. Each stage is supported with an extensive list of prompts used to encourage practitioners to think critically about each vital 'what'. One of the most important developments in this model is the shift away from reflective practice to *reflexive* practice: a framework in which action leads to changing circumstance, where the practitioner plays an active role in shaping their own world – a concept far removed from the early works of Schon and Kolb. However, an issue with Rolfe et al.'s model is that it doesn't completely move away from the pre-established norms of the healthcare setting. Writing before Rolfe et al.'s publication, Sweet (2010) observes that there is a lot of dogma when it comes to reflective practice in healthcare, with the implication that 'reflective practice is an individual activity carried out alone' (2010, p. 182). This criticism certainly still applies to Rolfe et al., whose model is very much focused on the 'I' rather than the collective group – as demonstrated by the range of question prompts focused on the self, rather than the self-plus-world.

There is also an implied assumption in Rolfe et al.'s model that the ability to change one's world can only go so far, and can only ever really be limited to the tactical level. After all, healthcare organisations are by their very nature, complex, bureaucratic organisations, and so it can certainly be argued that their model reflects the limitations of the working environment in which practitioners operate. It is certainly not a model that can be easily applied elsewhere or for a broader purpose.

**Table 1**  
Popular theories of reflective practice.

Theory	Summary	Drawbacks
Schon (1983)	<ul style="list-style-type: none"> <li>Reflection-in-action: appreciation, action and reappreciation (p. 156).</li> <li>Focus on applying lessons of the past to experiences of the present.</li> </ul>	<ul style="list-style-type: none"> <li>Doesn't address the role of reflection-<i>before</i>-action (Greenwood, 1993).</li> </ul>
Kolb (1984, 2015)	<ul style="list-style-type: none"> <li>Four-stage 'Experiential Learning Cycle': Concrete Experience, Reflective Observation, Abstract Conceptualisation, Active Experimentation (2015, p. 93).</li> <li>Among the most widely used and influential theories on learning used today.</li> </ul>	<ul style="list-style-type: none"> <li>Arguably too simplistic.</li> <li>Fails to capture the importance of observation.</li> <li>Question around the relationship between each individual cycle and each new lived experience.</li> <li>Cycle only really works in abstract isolation.</li> <li>Many issues with Kolb's re-framing of his theory in terms of spirals (see Section 1.1).</li> </ul>
Gibbs (1988)	<ul style="list-style-type: none"> <li>Six-stage cycle: Description, Feelings, Evaluation, Analysis, Conclusion, Action Plan</li> </ul>	<ul style="list-style-type: none"> <li>Too descriptive in approach.</li> <li>Doesn't effectively consider context.</li> <li>Emphasis on reflection <i>after</i> the event.</li> <li>Doesn't look beyond the scope of the event itself; only prepares practitioners for when they might encounter a <i>similar</i> event in the future.</li> </ul>
Driscoll (1994, 2007)	<ul style="list-style-type: none"> <li>Three-stage model of reflection: 'What?', 'So what?' and 'Now what?'</li> </ul>	<ul style="list-style-type: none"> <li>Drawbacks similar to Gibbs though does highlight the importance of synthesis and applying learning to many <i>different</i> experiences in the future.</li> </ul>
Raelin (1997, 2008)	<ul style="list-style-type: none"> <li>Proposes several related models of learning for the individual and the collective.</li> <li>Distinguishes between learning as theory and practice.</li> <li>Also contrasts explicit and tacit knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>Theory is overly abstract in nature.</li> <li>Doesn't offer an easy way to think about the <i>process</i> of learning.</li> <li>Not enough grounding in the day-to-day.</li> </ul>
Rolfe et al. (2011)	<ul style="list-style-type: none"> <li>Return to 'What?' model of reflection, focusing on practical applications by giving healthcare practitioners an extensive list of prompts.</li> <li>Shift away from reflective practice to <i>reflexive</i> practice where the practitioner plays an active role in shaping their own world.</li> </ul>	<ul style="list-style-type: none"> <li>Arguably too prescriptive; doesn't encourage reflection beyond the prompts provided.</li> <li>Focuses very much on the 'I' rather than the collective group.</li> <li>Limited applicability in fields outside of healthcare.</li> </ul>
Jasper (2013)	<ul style="list-style-type: none"> <li>Three-stage ERA cycle: Experience, Reflection, Action.</li> </ul>	<ul style="list-style-type: none"> <li>Overly simplistic.</li> <li>Some question around how Action feeds into the chain of linked cycles; arguably turns the practitioner into passive observer rather than active agent.</li> <li>More widely applicable than Rolfe et al. (2011), though still very much focused on healthcare.</li> </ul>

Finally then, we come to Jasper’s ERA cycle (2013). Jasper herself was a co-author on the Rolfe et al. paper, and so her cycle feels very much like a natural progression. The cycle itself is simple: Experience, Reflection, Action (p. 3), with a focus on the fact that ERA is a cycle that never stops, with one new perspective feeding into the new experience, subsequent reflection and so on. It is interesting then that the Action part of the (individual) ERA cycle does not feature in Jasper’s combined ‘Cycles of reflective learning’ (p. 4), which shows a series of linked cycles where experience leads to reflection, which leads to new perspective and then new experience. While the concept of linking cycles in itself makes some pragmatic sense, the way Jasper maps this process is somewhat problematic as it appears to turn the practitioner into a passive observer rather than active agent, and as mentioned above, may be a product of the way healthcare systems operate around the world. While Jasper’s cycle is certainly useful and reflects a nice simple model that is easy to digest and share, again, healthcare-based models seem to fall-down when it comes to the relationship between the practitioner and the ‘real-world’.

Just as with Schon and Kolb, each of these developments in reflective practice leave a lot to be desired, and never quite produce a model that successfully balances theory and practice, the individual and the world (see Table 1). Furthermore, none of the models described above can be applied at different scales. Either they depict a passive observer, an active agent with limited scope for change, or they are so abstract that they don’t offer practical solutions either at an individual or organisational level. As with the case of Schon and Kolb, the answer here is not to simply keep re-iterating the same worn tropes, but rather to throw away the rulebook and start again.

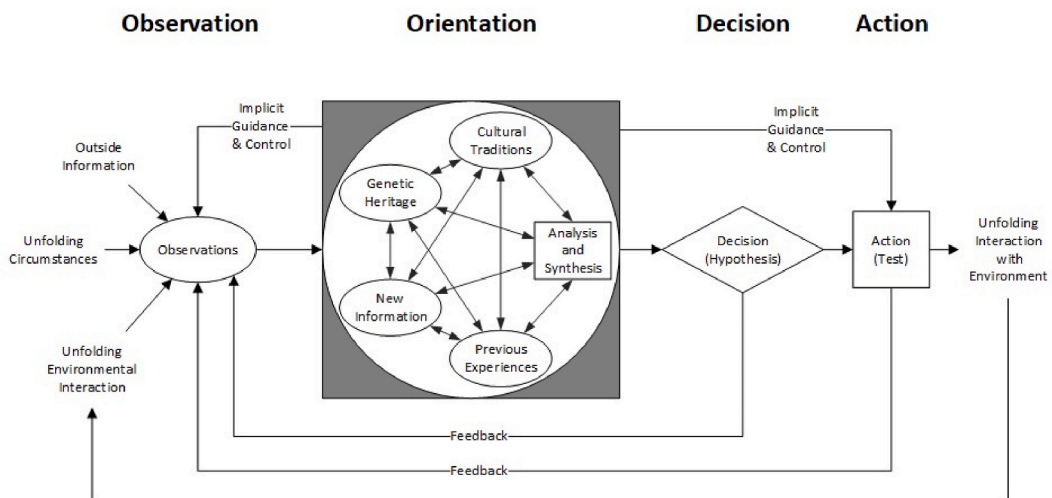
**2. Introducing John Boyd**

Many readers will not have heard of Colonel John Boyd (1927–1997), and yet he has been described as one of the most important military strategists of the twentieth century, likened even to the great Sun Tzu (Osinga, 2007, p. 3). His most important theory, the OODA loop (Boyd, 1995, slide 3), is a means of understanding the world and the process of information feedback. While the theory was initially devised as a means to explain the decision-making process of fighter pilots engaged in aerial combat, it can be applied far more broadly, and as we argue in this paper, can be used as an alternative to Kolb et al. as a way to think about teaching, learning and reflective practice. As Olsen (2016) observes:

Although Boyd did not focus on business per se, he showed an interest in management theory, especially in themes such as competition, organizational survival, and adaptability. He wanted to prove that his Big Idea had universal applicability (p. 8)

In this case, we argue that the OODA loop offers a far more nuanced view of learning than the experiential learning cycles discussed in this paper. Indeed, the OODA loop concept is also easily scalable, and can be applied both to the individual and to the organisation in which they work. This gives practitioners a far more practical and useful tool by which to think about learning and how one can respond to change and adapt to the needs of a dynamic workplace.

At its most simplistic level, the OODA loop represents four stages: Observe, Orient, Decide, Act. However, a closer reading reveals several key feedback processes built into the system that shape our worldly observations and the way we respond. At the heart of the theory is the stage of Orientation (Maccuish, 2011), a point at which traditions, experience, new information and ‘genetic heritage’ act upon observations and exert implicit guidance and control over these same observations. The outcome is a decision or hypothesis, which then leads to an action, and unfolding events in the real world. All of which feedback into both what we observe, and how we orient ourselves relative to the world itself. Indeed, it is the use of multiple feedback elements within the loop that sets it apart from



**Fig. 1.** John Boyd’s OODA loop. Based on Boyd’s sketch in ‘The Essence of Winning and Losing’, a briefing made to members of the military in 1995 and 1996. The layout used here mirrors that used in Bousquet’s *The Scientific Way of War* (2009, pp. 187–188).



many other models of reflective practice, in particular, the way that Orientation exerts implicit guidance and control over not just our actions, but the way we perceive the world in the first place (see Fig. 1).

Despite the clear links between the OODA loop and learning behaviours, Boyd's work has had relatively little impact outside of military circles. Those few papers that have been published on Boyd are in fields as diverse as healthcare management (Enck, 2012), policing (Walsh & Henry, 2008), disaster management (Von Lubitz et al., 2008), fire engineering (Alden, 2022), risk management (Punia et al., 2014), team sport (Jeffreys, 2016) and emergency response (Huang, 2015). The OODA loop has also been suggested as a means to enhance the process of education administration (Rogers, 2010), as well as goal setting in higher education (Mahmood, 2018) – though neither author explores the concept from a teaching and learning perspective. Most significantly perhaps, Boyd's work inspired Colonel Chet Richards' *Certain to Win: The Strategy of John Boyd, Applied to Business* (2004), and a short feature article in *Harvard Business Review*: 'Decision Making, Top Gun Style' (Boncheck and Fussell, 2013).

And yet despite this small progress, Boyd's theory is still underrepresented. While some commentators (and indeed, military strategists) have misunderstood the OODA loop and attributed success to merely 'completing the loop faster', the real value of Boyd's theory is in its approach to thinking and understanding one's orientation with respect to the wider world. As Frans P.B. Osinga claims, the OODA loop is 'much less a model of decision-making than a model of individual and organisational learning and adaptation' (2007, p. 235) – a tool which Osinga himself links to the process of self-reflection within individuals and organisations (p. 80). In this way, Boyd's work remains highly relevant, and offers fascinating insight into the process of decision-making and reflective practice.

As such, the rest of this paper will examine Boyd's theory in more detail, and attempt to apply Boyd's thinking to theories of teaching and learning, as well as management practice, evaluating new opportunities for individuals to become reflective, proactive, *adaptable* practitioners that are more resilient and better equipped to deal with the uncertainties that the fourth industrial revolution brings.

### 3. Observe, Orient, Decide, Act

The OODA loop describes the four stages of decision making in a changing world: Observe, Orient, Decide, Act. However, as Fig. 1 shows, the theory is somewhat more complicated than the acronym suggests. This is because the loop places significant emphasis on orientation as a guiding force shaping how we gather observations, which themselves feed into orientation and the way we understand our place in the world. As Antoine Bousquet observes in *The Scientific Way of War* (2009), 'Boyd lists several elements which come into play in determining new frameworks [ ... ] but these are less important than the very principle that such frameworks can and must change' (p. 189). This applies not just to strategy on the field of battle, but also to the way we understand learning more broadly. As Bousquet notes: '[Boyd] explicitly rejects the possibility of such a final and total understanding of war and points to the irreducibly incomplete and evanescent character of any theoretical framework seeking to encapsulate reality' (p. 189). While Bousquet is writing here about war, this same principle can be applied to any system be it the way we think about management learning, or the way organisations themselves grow and learn.

To fully appreciate the OODA loop, first we must accept the role of change as a fundamental driver of the system. Boyd's theory emphasises the fact that all systems – no matter what form they take – are subject to change, as without change they will soon fall into stagnation and decline. Often, this change can occur in sudden or unexpected ways. This is something that existing theories of reflective practice simply do not consider. For the most part, they tend to imply a fixed system in which the practitioner is the one who changes in response to a pre-existing (and therefore, pre-determined) world. What they don't then show is that the practitioner themselves is a part of the world in which they are reflecting upon; nor do they sufficiently reflect the practitioner's ability to change the world of which they are a part.

Given the rigid, formalised structure of the reflective models discussed in this paper, it is significant that for Boyd, no framework can ever or will ever encapsulate reality – there is no final answer, and we can never gain complete understanding of any given situation. To think that a single model could encapsulate reality would be to misunderstand the way the world works, and would therefore limit one's thinking and potential for future growth.

With these concepts in mind, it would be a mistake to assume that 'success' with the OODA loop can merely be achieved by completing the loop more quickly. Indeed, Boyd's theory is far more subtle than that. In 'The Strategic Game of ? and ?' (1987), Boyd spends several slides talking about the link between speed and success. To open this discussion, Boyd argues that 'One cannot determine the character or nature of a system within itself. Moreover, attempts to do so lead to confusion and disorder' (slide 41). He then goes on to talk about the USAF Lightweight Fighter programme of the 1960s, in which he and his fellow researchers discovered that 'The ability to shift or transition from one maneuver to another more rapidly than an adversary enables one to win in air-to-air combat' (slide 42). It is *not* the case of simply making decisions more quickly, but rather having the ability to process each stage more quickly within the context of unfolding circumstances.

In a learning context, we might think of this as both reflection-for-action, and also reflection-in-action where a student's ongoing reflections and position in relation to knowledge might (and indeed, should) change and adapt as a session unfolds and new information changes the student's orientation. It is not about there being a 'right' or 'wrong' approach, but rather, students should be prepared to adapt their position based on new information that enters the system.

So far, this theory seems to make sense. Having a better understanding of one's situation and an ability to operate at a faster tempo gives one a clear advantage in a competitive environment – especially when we move beyond formal education and apply learning to the real world. However, the advantage here is not so much in the speed of operation, but the ability to *effectively* process all factors, and attain an intuitive understanding of the situation. In this case, to Observe the situation from as many angles as possible; to Orient oneself to the information; to Decide the best course of action based on current known information; and to Act based on all of the above

– while also being prepared to change again as the situation develops. It's not about sticking to a rigid computational formula that can be completed faster and faster as a means for achieving success, but rather making faster *informed* action, while understanding where that information comes from, and the impact that one's actions may have.

A good example might be the student who memorises a long list of management theories and develops excellent speed of recall. While this may be a useful skill to pass an exam, what the student doesn't gain is the intuitive ability to process factors and apply them to a given situation. This requires a far deeper level of understanding than a textbook or list of management theories can provide. Much rather, it requires knowledge and understanding beyond the formal realms of any given subject: it requires speed of contextual processing, rather than speed of recall.

This is why Boyd's theory is so useful. For Boyd, the focus should be on developing a way of thinking that moves beyond rigid formal structures, and that draws upon a wide range of theories and experiences. Boyd puts it best in the following slide:

We can't just look at our own personal experiences or use the same mental recipes over and over again; we've got to look at other disciplines and activities and relate or connect them to what we know from our experiences and the strategic world we live in [line break] If we can do this [line break] We will be able to surface new repertoires and (hopefully) develop a fingerspitzengefühl [finger-tip feeling] for folding our adversaries back inside themselves, morally-mentally-physically—so that they can neither appreciate nor cope with what's happening—without suffering the same fate ourselves (Boyd, 1987, slide 45)

For Boyd, it is this 'fingerspitzengefühl', or 'finger-tip feeling' that is at the heart of the theory. It is not a rigid set of rules or processes, but rather a way of thinking – a culture of learning and change that can be applied to any situation, and not just the dogfights of aerial combat.

#### 4. Adopting an agile mindset

While several scholars have considered the applications of Boyd to process scenarios such as policing, disaster management and emergency response (see above), none to date have used Boyd as a framework through which to consider reflective practice and learning more broadly in whatever setting it may take place – be it at home, a formal education setting, or the workplace (work-based learning).

One of the most important aspects of Boyd's philosophy is his theory on agility – the need to be flexible within a given system, and to keep one's orientation matched to the real world. On this subject, Boyd's former colleague Colonel Chet Richards proposes a simple thought experiment: a game of chess against the best player in the world. While the chess master may be better at chess and better equipped than us for a single game, it would be incredibly easy to win if we were to take two moves for every one of theirs. This thought experiment goes to show how agility can be used to overcome large, seemingly insurmountable disadvantages (Richards, 2004, p. 89).

Indeed, even the challenges posed by the fourth industrial revolution can be overcome by an agile mindset such as Boyd extols. From a Kolbian perspective, the automation of work would simply happen at a given time and the practitioner would have to stop and decide what to do next based on prior experience and abstract conceptualisation. However, a Boyidian approach would be far more proactive as the practitioner would anticipate changes based on unfolding events, and would be prepared to adapt and change to confront the problems before they become too great to surmount.

A good example of this would be when an organisation goes through a process of change. This may be a departmental restructure, or a situation where employees are asked to take on new or different responsibilities to what they have done in the past. In these situations it is the employees who are best able to adapt their 'working identity' to meet the requirements of a new role that will be most successful, and will cope best in the new working environment. An agile mindset then is absolutely critical to a dynamic working environment, as career trajectories are not linear like they once were. Indeed, in the new world order it is those best able to embrace change and adapt to unfolding circumstances that will be in the best position to seize opportunities that come their way.

This concept is encapsulated by Richards who notes that 'The essence of agility [ ... ] is to keep one's orientation well matched to the real world during times of ambiguity, confusion, and rapid change, when the natural tendency is to become disoriented' (Richards, 2004, p. 30). For Boyd, agility is fundamentally tied to orientation – itself a form of reflective practice – and our ability to both understand our own position in the world, and our position relative to the competition, be they large scale organisations or even rivals in a competitive jobs market.

This ties in very much with work by Gunawan et al. (2019, 2020), who propose a scale for measuring how young adults *perceive* their own employability. According to the authors, 'For young adults, perceived future employability is the representation of their occupational self after they have completed their study and/or training' (Gunawan et al., 2019, p. 612). In this case, personal identity is very much tied with one's perception of how employable one perceives oneself to be, both now, and into the future. By adopting a Boyidian approach to employment rather than a Kolbian one, we propose measures of perceived employability should improve, as individuals conceive of themselves in a more proactive, adaptable way, embracing change as an empowering part of working life, rather than disempowering as a Kolbian approach can often feel.

Indeed, it is most telling that none of the reflective learning cycles discussed in the first part of this paper give sufficient space to orientation and the self-awareness to recognise one's orientation as a factor influencing one's perception of an event as well as one's ability to adapt and respond to opportunities that present themselves. This is a major shift from old models of reflection such as Gibbs (1988), which invite a *description of feelings*, rather than an evaluation of experience. Orientation here is far more to do with placing oneself into the wider context of socio-cultural experience, rather than merely being a passive *descriptive* observer. In a similar way, Kolb's (1984, 2015) 'abstract conceptualisation' doesn't position the individual in relation to the outside world. The key element here is that the conceptualisation is itself *abstract* and isn't shaped by outside factors either before, during or after the process of

conceptualising a particular event. And yet clearly, this doesn't make any practical sense. The outside world is absolutely fundamental to everything we do – from what we observe to how to understand what we observe, and how we decide to act.

This is a topic that has become increasingly relevant in education. As Paul Ashwin observes, a large portion of student learning now takes place outside of the control of the teacher; it is an unstructured journey (2020, p. 165). Even more so in a post-Covid world of blended learning and the flipped classroom, which is becoming an ever more popular style of teaching (Fisher et al., 2018; Goedhart et al., 2019; Müller & Wulf, 2021). This means that the teacher's role is more important than ever, not just for articulating knowledge, but rather 'scaffolding the way students think' (Laurillard, 2012, p. 4). While some colleagues have proposed adopting a 'scaffolding' approach to overcome some of the issues with Kolb's model of experiential learning (Wright et al., 2018), we contend there are far greater benefits from adopting Boyd's OODA loop theory as an alternative model to guide reflective practice.

Indeed, given the increasingly unstructured world in which students learn, Boyd's theory is now more important than ever, with the stages of Observation and Orientation the two most vital elements of the OODA loop concept. This is because both elements shape unfolding interactions with the environment and are fundamental in any form of self-directed learning. Furthermore, given the often social nature of learning (Ashwin, 2020), participants should also seek to understand the orientation not just of *themselves* as learners, but of their cohort, and of the formal knowledge structures imparted upon them by their tutors – they should strive to understand the 'big picture' and where their own learning fits in context. Only with suitable orientation – a flexible mindset coupled with an understanding of self – will observations become more perceptive, and the learning process become more effective in turn. Learning can then be applied to the orientation stage to further impart greater understanding upon observations as the cycle continues ad infinitum.

This is a particularly useful way of thinking about teaching and learning, as many traditional, formalised modes of learning don't tend to give students the option to think about a topic in a different way to the established norm. Such a mindset is likely to stifle progress in the long run if students (and practitioners more broadly) are not encouraged to 'think outside of the box' and appreciate that there's more than one way to observe and orient oneself in relation to any given piece of knowledge. This is something Brookfield (2017) observes in his work on reflective teaching, citing the danger of repeating the same mistakes over and over again if one is not open to critical self-reflection. This same point has also been raised by Sadler-Smith and Cojuharenco (2021) who claim that 'Pedagogies that discourage critical self-reflection may contribute to the inculcation of habits that favour hubris' (2021, p. 274). If management schools are to avoid the pitfalls of hubris – and training the managers of the future who themselves are full of hubris – then critical self-reflection should be at the very heart of what we do both as educators and working practitioners in the field.

Were we to adjust Boyd's OODA loop for an educator's perspective then, we might simply change 'Unfolding Circumstances' on the left-hand side of the diagram and replace it with 'Delivered Teaching' in a lecture or seminar setting (see Fig. 2). In this case, 'Outside Information' may well come from associated reading and learning activities, as well as interaction with teachers and peers. Of course, this would also fall under 'Unfolding Interaction' as actions lead to discussion and reflection, which (in an active learning environment) leads to further discussion and ongoing reflection outside the classroom.

Given this nuanced approach to reflection, relative to other less detailed models discussed in this paper, we might well describe Boyd's OODA loop theory as a 'deep' approach to reflection, much in the way that Biggs and Tang describe the benefits of deep learning versus surface learning in education (2011). According to Biggs and Tang (2011), level one of teaching and learning is all about the transmission of information – it's about what the student is (p. 17). Meanwhile, level two is about transmitting concepts and understandings (p. 18), while level three moves towards a student-centred model where the purpose of teaching is to support learning (p. 20).

To align Boyd's OODA loop with Biggs and Tang's levels of teaching, we might suggest that level three of teaching and learning is at a point where the student begins to recognise their own role in the loop. They are no longer a passive observer, but recognise their

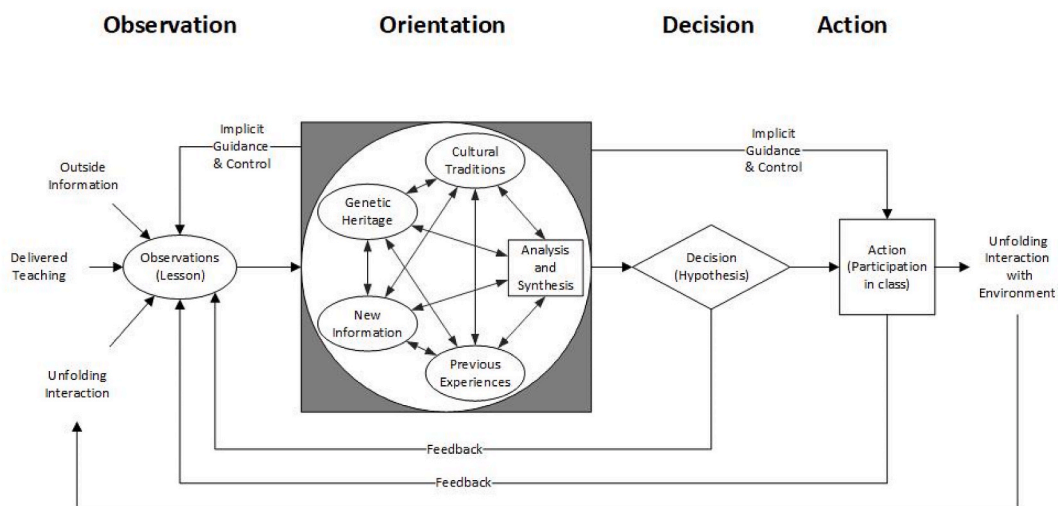


Fig. 2. Teaching and learning as an OODA loop.



ability to shape their own (learning) environment, and the way their personal orientation shapes their observations and subsequent actions. But of course, each OODA loop does not exist in isolation; one student's OODA loop will quite naturally flow differently to another's. This takes the OODA loop concept far beyond the likes of Kolb et al., whose theories require people fit their different experiences into a static model. These models may work reasonably well in settings where inputs follow predictable patterns, however, they do not work nearly so well in unpredictable situations where change in the norm. In contrast, the OODA loop is a far more dynamic model that embraces uncertainty, in which the loops of all students and teachers (in education), and all co-workers (in the workplace) are interrelated and reflections may take many different forms. Thus, in a classroom setting our OODA loops as teachers will interact with those of students' at the point at which actions lead to unfolding interactions with the environment and then subsequently, further unfolding interactions whether they be with other students or members of staff. These interactions then lead back into new observations and so on.

In this way, when deployed at a macro scale, such as in this example, the OODA loop can arguably be described as a new fourth level of Biggs and Tang's levels of teaching and learning: a new, further level of understanding where the student appreciates their place not just as a learner, but as part of a much larger system – as a series of interlocking, interrelated interactions between learners and teachers at a meta-educational level.

## 5. Practical applications

One of the most useful aspects of Boyd's thinking is the way he emphasises the role of implicit knowledge and skills in forming a successful strategy. In what is perhaps the most important slide in all of Boyd's work, he argues that: 'Without our genetic heritage, cultural traditions, and previous experiences, we do not possess an implicit repertoire of psychophysical skills shaped by environments and changes that have been previously experienced' (1995, slide 1).

In this case, it is not the 'endpoint' as such that counts, be it a certificate or other qualification, but rather the skills gained along the way. The important point for Boyd then, is that we learn to recognise all of our many varied skills for what they are, and how they can benefit us in our day-to-day interactions. This may include drawing out many of the 'soft skills' that are so invisible in the acquisition model of education, so that we learn to think about our skills in different ways. Of course, the next stage is to then recognise how skills shape our orientation. This may then impact upon our ability to carry out actions, in whatever domain they may be.

One possible use of the OODA loop here in a group exercise to assess students' individual and group orientations towards learning and the world of work. It is current practice at our institution to encourage students to reflect on how their own past experiences feed into the experiences that they have on their work placements. However, this reflection is usually fairly superficial as students lack sufficient past experiences and don't yet have the critical tools with which to analyse the workplace situations that they find themselves in. A part of the problem here is that the reflective cycles suggested by Kolb et al., rely heavily on past experiences, and don't take account of how events are encountered and perceived in the first place. In Boyd's approach, first one must understand one's own position before one even begins to reflect on experiences.

In a task relating to this concept of 'Orientation-in-action', students could be asked to build a map of all of the various elements that make them see the world in the way that they do. They should start with the likes of heritage, family history and educational background, and then extend their thinking to include their personal belief systems, their politics and their religion. When engaging in this activity they should be encouraged to think as broadly as possible, and include all of their many external influences from family and friends to sports teams and celebrities they follow on social media. They might also then consider their path through education and the many experiences they have had at school and/or college. Are they a 'natural' student? If not, why not? What experiences to date have led them to behave this way? How does their past experience in education impact on how they study and learn within higher education?

Once they have built a personal map for themselves, they can develop further nuance in their understanding by sharing their maps with fellow students to gain an understanding of how others perceive their own orientation and how their maps compare. By building up a stronger sense of how orientation shapes observation, students can therefore better situate themselves relative to unfolding events, and will have a better sense of how their own orientation can impact upon both how they perceive events, and then how they process them (much as it also shapes learning in a similar way). If one can first understand one's own personal orientation, one can then appreciate how it impacts on observation and action; and one can also take steps to adjust one's orientation based on critical self-reflection. This is an important element for personal development, for without reflection, as humans, we cannot grow.

If we are to think about Boyd's teaching in terms of reflective practice in the workplace, there are several key lessons that all students, educators and practitioners should take on board. Firstly, and most importantly: *all* locations are learning environments, be they home, school, college, university or workplace. Furthermore, *all* skills are worthwhile, no matter where they have been obtained. Certificates in and of themselves mean very little, as highlighted in the UK Government report by Felstead & Unwin (2016). Much rather, it is the *application* of learning (Orientation) to any given event that is important – something the academy needs to recognise if it is to produce graduates that are sufficiently well prepared for an uncertain and ever-changing workplace. With this in mind, we should seek to move away from old and outmoded concepts of reflection as a discrete 'thing' that is done in response to a single particular event – be it reflection-in-learning or reflection in the workplace. After all, no event occurs in isolation; and no OODA loop occurs in isolation either as they are all interlinked. Thus, we should encourage students learn from *all* events, not just those that are obviously similar or related. And not even just those that happen to themselves.

With this in mind, we propose teaching practice in work-based learning modules focus far more on *shared* stories from time in the workplace, such that students can share and learn from each other, and think about how lessons from other students' experiences can give them new insight into their own position. This can be done via small-group activities, or even through reflective diaries or blogs

that students can read and respond to outside of class. ‘Critical incidents’ are a particularly useful topic to focus on in this regard, as more often than not, students will encounter difficulties or challenges in the workplace that they can learn from through reflection, and which often give insight into one’s own position as active learner within the work environment.

As students engage with this task, they should be encouraged to reflect on their peers’ reflections through the lens of their own experience – and also think about how they might have approached the same situation differently. Drawing on the OODA loop theory, they might even consider how their peers’ orientation may have impacted on how they perceived the event, and how their orientation might be adapted to respond better to other challenges in the future.

To adopt an employment mindset here, we might then consider the role of orientation in the jobs market itself. According to Boyd acolyte Chet Richards: ‘you want to be the one who defines and continues to define what “new and desirable” means’ (2004, p. 165). This means adopting a proactive approach to the shifting jobs market, rather than a reactive one that many of the other reflective practice models mentioned in this paper tend to do. To help students engage with this concept, we propose sessions where students might be presented with a series of job adverts and person specifications, and asked to assess their own ability to meet the criteria outlined, and so create a narrative around their career that would help them answer difficult questions such as: ‘why did you apply for this job?’ and ‘how/why are you a good fit for this role?’

To encourage creative and critical thinking here, we suggest teachers start with more humorous examples that students can use to test their ingenuity (we recommend starting with jobs such as ‘chocolate taster’). Once the principles of reflective orientation have been established, and students have become more comfortable with the process the class can then look at more readily applicable roles the students may be interested in applying for (e.g. account manager, production assistant, communications officer etc.)

The aim here is not to suggest that every student should apply for every job; but rather to encourage students to adopt a more agile mindset that considers their orientation as job hunters, and how they can apply the various skills that they have acquired at university (both hard skills *and* soft skills), and apply them in a critical job setting – to adapt to the changing market, and get ahead of the competition. As Richards suggests: ‘Since business is a competition, you don’t have to be perfect, only better than everyone else’ (p. 165).

## 6. Conclusion

John Boyd’s OODA loop is one of the most useful and important tools available to us as reflective practitioners and has implications far beyond the scope of this paper. At its heart, the OODA loop is a mindset – a way of thinking about the world and our place in it. What really sets it apart is the way that it can be applied in any setting, both at an individual and organisational level, and the way that it embraces change as a fundamental driver of any system. This is an absolutely vital concept as any fixed model of the world is always destined to experience entropic decay (Bousquet, 2009, p. 221) – something that existing models of reflective practice simply fail to take into account. On the whole, models such as Kolb, Schon, Gibbs et al. are either too simplistic, too abstract, or too rooted in dogma to be applicable in rapidly changing world. Indeed, Boyd himself insists that regular overhauls of any framework are both ‘necessary and unavoidable’ (Bousquet, 2009, p. 189). The world is changing, and therefore frameworks need to change too. The fact most models do not account for the changing world goes to show that they were never fit for purpose in the first place.

This is why the OODA loop is such a useful concept – one that offers much potential for the field of management learning and reflective practice. It also offers a means by which business schools might make their curriculums more appropriate to the modern world of work, to give them an advantage against their competitors in the realm of education. As Thomas & Ambrosini argue: if business schools are to remain relevant, and are to continue to add value for their many diverse stakeholders, then ‘[they] need to break away from outdated models and challenge the assumptions underlying their current activities’ (2021, p. 251). Crucially, they note: ‘This implies more than just a change in curriculum’ (Thomas & Ambrosini, 2021, p. 251) – a view shared by Perusso and Baaken (2020) who argue for a change in business education. Given our rapidly evolving business context, developing reflexivity and critical reasoning skills is critical, and is ‘a far more subtle, complex, disorderly and emotional process than is currently implied’ (Dyer & Hurd, 2016, p. 288).

The ‘solution’ we propose then, is John Boyd’s OODA loop. At a fundamental level, the OODA loop places significant emphasis on the role of orientation and how it shapes both the way we perceive events and how we respond. With this in mind, business schools should seek to focus far more on reflective activities right from the start of their programmes – giving students the opportunity to reflect upon where they have come from, where they are going, and how they hope to get there. In this case, reflection should not be left to the final year.

As they engage in this process, students should also be prepared to face uncertainty and change. For Boyd, the OODA loop is not so much a rigid structure or template for thinking, but rather it is a way of thinking that embraces change at its very core – a theory that directly engages with the uncertainties that exist at the core of management practice (Bureau & Komporozos-Athanasidou, 2017). This may be done with the use of more ‘problem based learning’ (PBL) type activities, or designing activities around limited, ill-defined problems to test students’ abilities to problem-solve in an uncertain work environment. By embracing this change in its curriculum design and framing change as empowering, rather than disempowering, business schools can help shape graduates who are far more adaptable, proactive and forward thinking than many of those they will be competing against for jobs.

As Boyd shows us, without a proactive mindset for change, all systems are destined to decay as the world changes without them – just as careers are destined to decay if workers cannot adopt a mindset of rapid reorientation in the face of job uncertainty. To quote Boyd himself: ‘Without OODA loops [ ... ] we will find it impossible to comprehend, shape, adapt to and in turn be shaped by an unfolding evolving reality that is uncertain, everchanging, and unpredictable’ (1995, slide 1). This is the ‘solution’ we pose to the crisis in management posed by the likes of Tourish (2019, 2020) et al. It is, we hope, but the first step in many towards a new way of thinking

about business and management education.

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