ANGLIA RUSKIN UNIVERSITY

FACULTY OF SCIENCE AND ENGINEERING

RE-IMAGINING BUILT ENVIRONMENT EDUCATION:
INVESTIGATING THE PRACADEMIC THROUGH AUTOETHNOGRAPHY

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A thesis in partial fulfilment of the requirements of Anglia Ruskin University
for the degree of Professional Doctorate (Built Environment)

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Acknowledgements

Undertaking this doctoral journey at times has felt like a solitary process, but in moments when you are alone you appreciate those that are there in the background quietly willing you on. It has been an incredible journey, bringing twists and surprises as I deviate from the well-worn path. I may play a central part in my thesis, but it has developed through a plethora of shared experiences with so many unseen characters.

First, I would like to thank my wife, Claire, who has allowed me to escape this world and disappear into my own over the last four years, reminding me that occasionally I must come out of it; and who with all my children provided the daily inspiration to push and be more. I extend this to my parents and all my family who have been with me from the year dot to now, and those that are no longer with me but very much part of who I am today.

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I would also like to thank friends who I have shared experiences with, and that have brought me to this point in my life. At times I wonder how I have made this far, thankfully being focused on my experiences of built environment education some of the colourful moments and shenanigans are still ours alone. I extend my thanks also to colleagues from both industry and academia, of which there are too many to mention individually.

Thank you all.

Let's begin.

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ANGLIA RUSKIN UNIVERSITY

Abstract

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PROFESSIONAL DOCTORATE (BUILT ENVIRONMENT)

RE-IMAGINING BUILT ENVIRONMENT EDUCATION:
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LEON MATTHEW CRASCALL

April 2021

Purpose
This research seeks to mobilise the researchers own vocational, academic and professional experiences of built environment education, creatively challenging a personal belief it needs to be re-imagined. Through critique of historical and current practices, personal insights are offered from multiple perspectives that could benefit a range of influential stakeholders; whilst questioning their collective impact on the learning experience at different levels.

Research design
Autoethnography is underpinned by a range of scientific fields, particularly design science to explore artefacts relating to built environment education. Design of this qualitative inquiry emerges from the unfolding story, showcasing the flexibility autoethnography offers. Both qualitative and quantitative data are utilised through, personal memory, self-observational/ reflective and external data interchangeably to re-tell a story covering a 30-year period to deliver meaningful personal insights.

Findings
Analysis of comparable undergraduate built environment courses challenges the merits of sectorwide benchmarking, modularisation reflects siloed and fragmented practices; all impinge on the realisation of learning gain. In turn this raises questions of assessment practices in evaluating the success of both students and programmes; that academic education and professional training offers a confused learning environment at many levels currently. Anaylsis of experiential models raises questions regarding the relationship between theory and practice, that embedded knowledge reveals gaps between theoretical thinking and experiential reality.

Conclusion
This research challenges stakeholders at all levels, raises questions of current practices and their impact. Through using autoethnography, an authentic account extends knowledge and professional practice in this area of educational research. Pragmatic recommendations are offered for all stakeholders influencing built environment education, informed by critique of existing humanist experiential models and other artefacts to offer a new lifelong learning model and consider re-imagination of current practices.

Key words: Autoethnography, built environment education, professional doctorate, educational research, humanism, experiential learning, design science.

Table of Contents

List of Figures

List of Tables

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Chapter 1 – Introducing the Investigation

A brief introduction outlines my career and learning experiences. The title of this thesis is broken down and the seeds of need informs the key research aim, research question and objectives to help direct this investigation. The structure of this thesis is outlined, which along with introducing the characters help to visualise the autoethnographic journey through my built environment education.

A brief introduction

"Leon has worked with an enthusiasm that has not lasted. I hope that with maturity he will acquire the ability to concentrate." (English)

"Leon has worked steadily. He does need 'help' to keep his mind on his work and must try to develop more self-discipline next year." (Maths)

"Leon's mapwork is usually very good but he does not seem to be able to settle to written work for sufficiently long enough to produce equally good results and too much of it lacks thought and care!" (Geography)

"Leon's attitude is too inconsistent, ranging from the diligent to the inattentive. He is keen to do well but this does not happen without hard work and application. He must realise this". (History)

"Leon is too easily distracted by what is going on around him to produce anything like the work of which I feel he is capable of. This is unfortunate as I think he has a lot of artistic ability which he is at present wasting." (Art/ Craft)

"A somewhat disappointing set of reports. Leon's performance is spoiled by his immaturity." (Year Group Head comments)

"Leon's natural cheerfulness is much appreciated" (Headmaster comments)

A typical school report, if only life was headteachers' comments, eh! I will not dwell on it; I was 11 years old; it makes for good banter as family and friends laugh at my expense now and then. Anyway, 34 years later I have my *'enthusiasm'* still, I have *'matured'* and have more *'self-discipline'*. Taking my time to develop my *'artistic ability'* I now have the *'ability to concentrate'* and *'settle into writing'* this thesis. Leaving school with few qualifications I scraped through college, working as a tradesman for 10 or so years. I moved into a technical role, returning to college to do an HNC which I enjoyed. From school to HNC my attitude to learning changed, why and how did this happen? Moving into construction management, came my first-degree experience, totally different to my HNC, I dropped out; why were the outcomes from these experiences like chalk and cheese? Leading up to 2013 and becoming increasingly frustrated with the construction industry, I tapped into my *'artistic ability'* and returned to university full-time to study architectural technology, graduating in 2015; from an HNC and over 13 years another transformation, but again why and how did this happen? However, my biggest transformation was yet to come.

Immediately after graduating, I became a senior lecturer working in higher education, from 2013 my learning curve has been steep. I find myself in a privileged position from which to reflexively explore my unorthodox journey through built environment education. As a mature student studying with younger students, my interest developed in built environment education. As a *'pracademic'* I have developed a greater awareness of how my own beliefs, actions and behaviours can impact others. By exploring my own experiences, 30 years' worth of personal journals, coursework, certificates, and other data, I want to explore what drives my belief that how we educate built environment students currently needs to change. To better realise my own *'learning gain'*, I want to bring congruence to how I think and learn in the process; provide insights that make a small but significant contribution to knowledge and practice.

Fulton et al (2013, p.8) suggest PhD's are for those training for academic careers, an option to me. Boud and Lee (2009, p.172) highlight how professional doctorates are generally more practitioner-focused, *"built around the individual professional profile of the practitioner themselves"*: a more natural fit for my story. Preliminary research early in my doctoral journey focused on curriculum design but I grew sceptical of curriculum itself, that it was potentially the problem. Exploration into educational theory informs a belief that the design and use of curriculum confuses built environment education, but the question became about how do I explore this? Appraising a range of paradigms and methodological approaches, autoethnography was initially dismissed. Early in my doctoral journey I felt conflicted, in trying to meet learning outcomes I lacked clarity where my focus was. Due to health reasons came a re-think, nearly a year passed between my preliminary research and submitting my research proposal. Supported by my supervisors we re-visited autoethnography, a method that has naturally risen to the surface; in my view only a DProf would have led me to what you read now.

This thesis comes with a graphical health warning, not typical in autoethnography; hopefully, as you take this journey with me you will appreciate my motivation to conduct my DProf in this way. A central aim of this research is mobilising my experiences of built environment education, to reflexively explore different periods. Having operated on many different levels professionally I want this investigation to be '*congruent with my life's journey'* (Etherington, 2004, p.138), for this to happen you need to appreciate that I am not looking to *'externalise and intellectualize everything'* (Etherington, 2004, p.138). As a *'pracademic'* I am opening up my *'black box'*, my doctoral journey has been an enlightening experience, one of growth and evolution. One that brings insights from a unique position, insights I hope you find useful, and it provides food for thought.

Breaking down the thesis title to define the scope of this research

Before moving forward, I feel it useful to break down the title of this thesis (Fig. 1.1), to outline what the keywords mean for this investigation. Defining these keywords provides some context and offers insight into how I intend to imaginatively explore the topic, whilst providing a clearer path as we move forward. A google search is sufficient initially to explore these questions unless stated otherwise.
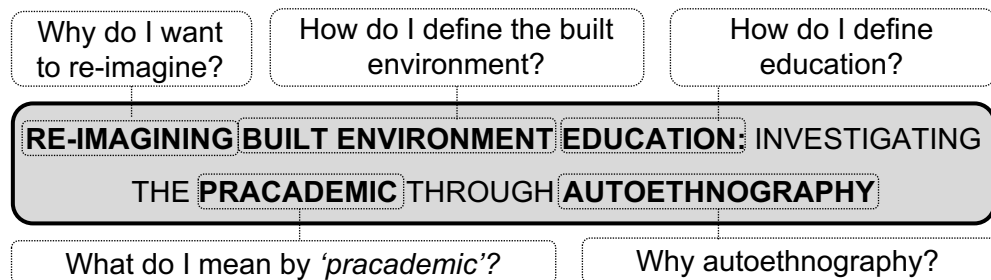
Figure 1.1 – Outlining and defining what the keywords in the thesis title mean for this research. (By Author).

Why do I want to re-imagine?

Merriam-Webster (2019) define reimagine as *"to imagine again or anew, especially: to form a new conception of: RE-CREATE"*. Collins (2019) define reimagine *as "to imagine again or in a different way"*, my preferred definition; it states in a *'different way'* not *'anew'* like Merriam-Webster. I am not looking to add or offer something new, based on my experience I feel all the tools and artefacts are already available; they just need to be explored in a *'different way'* to help better connect-the-dots in my experiences*.

Merriam-Webster and Collins define reimagine without hyphenating the *'re'*: Grammarbook (2019) in discussing *'reimagine or re-imagine'* provide a rule for the use of hyphens:

> *"Use the hyphen with the prefix re only when re means 'again' AND omitting the hyphen would cause confusion with another word".*

So, I am seeking to *'re-imagine'* built environment education, because I will be re-visiting my experiences *'again'* to develop insights contributing to knowledge and practice; with recommendations informing opportunities for future research. I am *'reflecting-on-action', 'again',* whilst *'reflecting-in-action'* (Schon, 1983) on my experience. I did consider alternatives to re-imagine, such as *'re-create'* but I do not want to regurgitate. I could *'re-think'*, but I have not carried out this research before, so do not know how to change or improve built environment education at this point. I could be radical and state I want to *'re-invent'* but what needs re-inventing exactly? And I do not want to get ahead of myself. So *'re-imagine'* in the title of my thesis allows me to explore built environment education delicately and sensitively through autoethnography, even if this only results in a re-imagination of my own beliefs.

How do I define the built environment?

Designing Buildings Wiki (2019) state:

> *"The term 'built environment' refers to aspects of our surroundings that are built by humans, that is, distinguished from the natural environment. It includes not only buildings, but the human-made spaces between buildings, such as parks, and the infrastructure that supports human activity such as transportation networks, utilities networks, flood defences, telecommunications, and so on".*

A comprehensive definition, but it offers limited connection to education. Collins dictionary (2019) simply defines built environment as *"the buildings and all other things constructed by human beings"*; a dream definition for an autoethnographer? McClure and Bartuska (2007, p.5) describe the built environment as *'pervasive'*; *'more comprehensive'* and *'far-reaching than most of us realise'.* Acknowledging this is not helpful Bartuska breaks his definition down to *'four interrelated characteristics'*.

> *"First, it is extensive; it is everywhere; it provides the context for all human endeavours. More specifically, it is everything humanly created, modified, or constructed, humanly made, arranged, or maintained.*
>
> *Second, it is the creation of human minds and the result of human purposes; it is intended to serve human needs, wants, and values.*
>
> *Third, much of it is created to help us deal with, and to protect us from, the overall environment, to mediate or change this environment for our comfort and well-being.*
>
> *Last, an obvious but often forgotten characteristic is that every component of the built environment is defined and shaped by context; each and all of the individual elements contribute positively or negatively to the overall quality of environments both built and natural and to human-environment relationships".*

'Comprehensive', it develops upon the Collins definition: but basically, the built environment is anything the human *'I'* can imagine and construct to suit my needs, values, wellbeing, and context (Fig. 1.2).

The Built Environment

The built environment is everything humanly made, arranged, or maintained;

to fulfill human purposes (needs, wants, and values);

to mediate the overall environment;

with results that affect the environmental context.
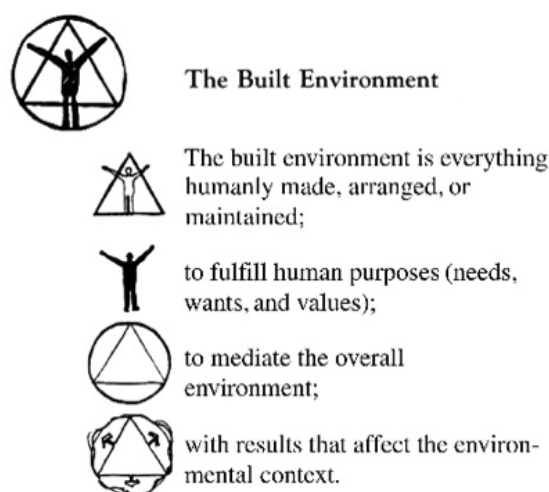
Figure 1.2 – Definition of the built environment and its four related characteristics. (McClure and Bartuska, 2007, p.5).

The Oxford dictionary (Lexico, 2019) defines education as *'the process of receiving or giving systematic instruction, especially at school or university',* a particularly limited and linear definition; what if like me you have received some of your education outside a school or university? A significant amount of my built environment education certainly has. Dictionary (2019) offers a few options to consider:

1. *'The act or process of imparting or acquiring general knowledge, developing powers of reasoning and judgment, and generally of preparing oneself or others intellectually for mature life.'*

2. *'The act or process of imparting or acquiring particular knowledge or skills, as for a profession.'*

3. *'A degree, level, or kind of schooling: a university education'.*

4. *'The result produced by instruction, training, or study: to show one's education'.*

5. *'The science or art of teaching; pedagogics'.*

Good to have options, the 1st, 2^{nd,} and 4th provide sufficient scope at this point to provide a definition of education which will guide us through this thesis:

"The act or process of imparting or acquiring general or particular knowledge or skills, developing powers of reasoning and judgement, and generally preparing oneself or others intellectually through instruction, training, or study".

I thought should I include *'profession'*, but personally, I feel it would be limiting; especially within the disciplinary *'siloes'* of built environment education. What if you wish to educate yourself with no profession in mind? Considering what the built environment offers, learning for a *'profession'* seems backward in the 21st century; particularly so with *'higher'* education, it should mean more than what it has currently been reduced to. Autoethnography is criticised for being *'self-indulgent'* (Denzin, 2014, p.69) enough, including *'profession'* would mean continuing to be an artefact *(professional)* within an already siloed and fragmented culture, where many built environment professionals currently operate. Much of my built environment education has been orientated through disciplinary training; my mindset is not naturally orientated this way.

'Instruction, training, or study' with *'pedagogics' (above)* are areas I will explore, particularly the use of pedagogy, andragogy and heutagogy; to consider how they may impact the delivery of built environment education. Likewise, I will pick up on types of knowledge and reasoning as we progress, which I will look to contextualise through better understanding artefacts associated with my own experiences, and through exploring the literature in chapter 4.

What do I mean by *'pracademic'*?

The word *'pracademic'* came to my attention at an academic conference in 2017. Initially, I thought of the term as bit of a gimmick, but it has come back into focus as I have progressed through my doctoral journey. Walker (2010) states:

> *"a pracademic is someone who spans both the somewhat ethereal world of academia as a scholar and the pragmatic world of practice".*

'Pracademic' is a cap that fits, I am a career learner; someone whose been immersed in both academia and practice within the construction industry for 30 years. Wilson (2015) states: *"Pracademia celebrates certainty of self over conformity",* as a non-conformist this if anything brings uncertainty. Posner (2009) states:

> *"Pracademics can switch across the boundaries in both directions",* seeing *"the synergy between theory and practice,"* …….

……. playing an important part in the *"nexus between academics and practitioners".*

But before I truly think of myself as a *'pracademic'* I have questions to explore, because of my own experiences of built environment education. I question the relationship between theory and practice, there is a need to better understand the role theory plays and how it influences practice; this research will aim to rigorously explore this relationship as I meander through my own experiences.

Why autoethnography?

The early part of my doctoral journey focused more on scientific approaches to explore curriculum design, but this brought scepticism, questions of curriculum itself. I will begin to unpack this further autoethnographically in chapter 3, in which I will creatively tease out this scepticism through different characters to showcase the multiple perspectives I bring to this investigation. As much as autoethnography may have risen naturally to the surface, I can now challenge myself in a totally different way; develop new skills whilst exploring what my experience already offers, as myself and the narrative evolve naturally within this thesis.

Autoethnography is a form of narrative research, either fully or partially used in professional doctorates (Fulton et al, 2013, p.61). It allows you to study personal experiences *(auto),* to better understand self in the cultural experience *(ethno),* to systematically analyse *(graphy)* and describe your research findings (Ellis, Adams and Bochner, 2011). It is "*both a method and a text"* (Etherington, 2004, p.139), *'a scientific method of writing'* (O'Hara, 2018). Reed-Danahay (1997, p.6) states autoethnography is *"a form of self-narrative that places the self within a social context",* which *"critiques the situatedness of self and others in social context"* (Spry, 2001, p.710)*.*

Adams, Holman-Jones and Ellis (2015, p.1) states autoethnography:

- *Uses a researcher's personal experience to describe and critique cultural beliefs, practices and experiences.*
- *Acknowledges and values a researcher's relationships with others.*
- *Uses deep and careful self-reflection – typically referred to as "reflexivity" – to name and interrogate the intersections between self and society, the particular and the general, the personal and the political.*
- *Shows people in the process of figuring out what to do, how to live, and the meaning of their struggles.*
- *Balances intellectual and methodological rigour, emotion and creativity.*
- *Strives for social justice and to make life better.*

This investigation showcases me in the *'process of figuring things out'*, to find a focus. Reed-Danahay (2009) highlights that in doing autoethnography it is to confront *"the tension between insider and outsider perspectives, between social practice and social constraint"*, I will let the tension build for the coming chapters.

As an autoethnographer Ellis (2016, p.13) states:

> *"I am both the author and focus of the story, the one who tells and the one who experiences, the observer and the observed, the creator and the created. I am the person at the intersection of the personal and the cultural, thinking and observing as an ethnographer and writing and describing as a storyteller."*

So far it feels like a good fit, I want to escape the *'well-worn'* path of quoting every author associated with autoethnography itself, but I am still '*in the process of figuring out what to do'* exactly. I need to come up with a writing strategy and get my head around how I best use it, but I imagine this is the *'tension between the insider and outsider self'* building up; I will come back to this in chapter 2.

Adams, Holman-Jones and Ellis (2015, p.25) outline *'core ideals'* to consider for designing autoethnographic projects.

- *Recognizing the limits of scientific knowledge (what can be known or explained), particularly regarding identities, lives, and relationships, creating nuanced, complex and specific accounts of personal/cultural experience.*
- *Connecting personal (insider) experience, insights, and knowledge to larger (relational, cultural, political) conversations, context, and conventions.*
- *Answering the call to narrative and storytelling and placing equal importance on intellect/ knowledge and aesthetics/artistic craft.*
- *Attending to the ethical implications of their work for themselves, their participants, and their readers/audiences.*

McKernan (1991, p.193) suggests *"it's no longer feasible to employ single method research designs"*, but autoethnography offers simplicity using multiple '*tools'* to antagonise the *'lived experience of self'*; a tool to connect my *'scientific knowledge'* and *'artistic craft'*, to explore the wider culture of built environment education.

Seeds of need

Construction and education contribute significantly to the UK economy, the Department for Business Innovation and Skills (DBIS, 2013) states *"construction contributes almost £90 billion to the UK economy (6.7%)"*. The UK education sector generates almost £20bn in exports overseas alone for the UK economy (GOV.UK, 2019); higher education has become a marketised system with controversial *'excellence frameworks'* to benchmark research, teaching and knowledge exchange (Wyness, 2013). Greater expectations are placed on universities to seek the *'holy grail'* of *'learning gain'* (SEDA, 2019), to demonstrate how they impact and contribute to graduate success.

The Open University (2019) states *"The UK skills shortage is costing organisations £6.3 billion a year"*; Science, Technology, Engineering and Maths (STEM), digital literacy skills and numeracy identified as areas lagging. The UK Government's (BEIS, 2017) *'Industrial Strategy'* attempts to re-energise the UK population, *'developing skills'* one of *'10 Pillars'*; focused on, '*building a new system of technical education to benefit the half of young people who do not go to university*' (BEIS, 2017, p.11), and *"establish a technical education system that rivals the best in the world to stand alongside our world-class higher education system"*. Michael Heseltine (BBC, 2016) states:

> *"If I could design an industrial strategy it would start in the primary schools, about a quarter of children leaving primary schools are "illiterate and innumerate" by modern employment standards".*

This would require a significant cultural shift and change to government policy, but children are becoming more globally aware of issues and have greater access to information and knowledge. Sir Ken Robinson (TED, 2010) suggests that we need to change the paradigms of 21st-century education, that *"we are trying to meet the future by doing what we did in the past"*; stuck in an Industrial Age model.

'Changing the paradigm' within built environment education means escaping the siloed and fragmented practices of construction and education, deviating from usual channels to disrupt both industries. It sits within both technical and higher education, which can present sterile and passive simulations of professional practice. Implicit processes gained through experience, informs explicit knowledge (Eraut, 1994), it can be difficult when explicit comes first; both for staff to communicate and for students who lack experience to grasp its concepts, learning environments matter. But students can also be limited by folk knowledge, by the beliefs and practices of staff comfort zones and their experiences in practice. But in turn, the staff experience has been impacted by *'student as consumers'* (OfS, 2019) who at times *'want to do less with more'*, chase a default *'1st or 2:1'* grade with minimal effort; at the expense of learning.

A perceived skills gap in the building industry is longstanding, Lonberg-Holm and Larsen (1940) state it is an industry *"slow to change"* with an increasing emphasis on *"specialization of activities"*. The Edge (2015) suggests *"resetting the DNA of chartered professionals"*. Susskind and Susskind (2017, p.37) feel a change of mindset is required with professions, that technology will impact the future of *'experts';* the 21st century seeing rapid technology advancement, but technology always disrupts. Whether living in a *'Digital Age'* or a *'Industrial Age hangover'*, *"transformation is about people"* (CIO, 2018).

Tett (2015, p.16) feels we live in something of a paradox *"that while the world is increasingly interlinked in a system, our lives remain fragmented"*. Crease and Goldhaber (2015, p.87) state *"sometimes we insist on being treated the same way as everyone else, while at other times we insist on being recognized as special and unique"*. Some such as Westover (2018) are in a '*special and unique'* position taking us on a journey through their experiences, in doing so allow us to reflect on our own lives, and to discover more about the cultures and communities that shape us. In the paradox of built environment education, we have the capability and knowledge to better cater for the individual, yet we persist in delivering to everyone in the same way. Students can be viewed as *'not being independent learners'*, but who may just be students that have difficulty being taught *'what others want to teach us'* (Sharples, 2019).

In his address to Stanford University graduates Steve Jobs (Stanford News, 2005), ironically a college dropout, provides three life stories, the first is *'connecting-the-dots'* and finishes:

> *"You can't connect the dots looking forward; you can only connect them looking backwards. So, you have to trust that the dots will somehow connect in your future. You have to trust in something; your gut, destiny, life, karma, whatever. Believing that the dots will connect down the road will give you the confidence to follow your heart, even when it leads you off the well-worn path, and that will make all the difference".*

By leaving the *'well-worn path'* and exploring experiences our lives present us with, we can better *'connect-the-dots'*; part of my journey comes within a global coronavirus pandemic, a seismic paradigmatic shift. As *'experts'* or not, we are living in unprecedented times; educational models are quickly changing. Individually, we need to operate with a greater awareness of how we impact ourselves and others, because in my view mainstream education on all levels in the 21st century is too engrossed in measuring learning gain at the expense of helping realise it. This thesis takes a personal inquiry approach through autoethnography to explore built environment education through different periods, it does so by antagonising the *'lived experience'* from different viewpoints of *'self'*. My investigation arises from a *'vague feeling that something is out of place'* (Sharples, 2019, p.26), a *'felt difficulty'* (Dewey, 1910), it comes with a desire to bring congruence between theory and my experiential reality.

To help *'connect-the-dots'* I will refer to graduate attributes continually, use them as a tool to guide the unfolding story; I do so because this is where I see a gap in knowledge and practice within built environment education. AdvanceHE (2020) states:

> *"Graduate attributes are defined differently from one HE provider to another but generally include components which relate to the mastery of subject-specific knowledge, study skills, digital literacies and other 21st century skills."*

Across professional and academic stakeholders' graduate attributes are referred to and '*defined differently'*, Biggs and Tang (2011, p.10) refer to *'graduate outcomes'* to state:

> *"Graduate outcomes are conceived in mainly two different ways: as generic, comprising of context-free qualities or attributes of individuals, as if graduates would be 'creative' whatever they do; or as embedded, that is, as abilities or ways only intended to apply in the graduates content area."*

Graduate or not, as a learner I am naturally *'creative'* but generic statements *'reifies the attributes'*, it makes concrete those particular skills, attributes and behaviours offered, implying others possibly are not of equal value; it is a waste of institutional energy if not embraced and valued collectively. The immediacy of my transition from graduate to senior lecturer has magnified an apparent gap; as a student, I was not fully aware of the merits of graduate attributes; as an educator, I see how they are undervalued by staff, that institutions do not fully appreciate their value in realising *'learning gain'*. So, I will look to *'embed'* the principle of graduate attributes into this thesis to direct the narrative, to showcase their value to any level of study; this makes autoethnography an important *'tool'* for bringing multiple perspectives together.

As a graduate reflecting after graduation, I felt academically educated but not necessarily competent going into architectural practice; considering built environment education is predominately professional training, I question how we assess the ability of students, the design of programmes and the impact they have on any perceived skills gaps. In my experience and observing current practices at undergraduate level, by design, programmes increase in complexity and subject matter but are not sufficiently convergent to truly measure the ability and competence of learners in my view; realisation of my own learning gain came after the period of study itself. From this, I have questioned my own competence, and the value of what it costs to study. As a professional I have at times questioned what purpose my formal education has served, and how it relates to practice. Coming into academia, immersing myself within its culture, I have much admiration for those I work with and have studied under. However, I believe we can do better; in exploring *'why'*, I can then be better placed to answer *'how'*. By *'connecting-the-dots'* in my experience and providing meaningful personal insights, I will aim to make a small but authentic contribution to knowledge and current practice.

Research aim

The aim of this investigation is to mobilise my own vocational, academic, and professional experiences of built environment education, to provide meaningful personal insights able to benefit a range of stakeholders influencing current practice, and to inform recommendations for re-imagining the built environment learning experience.

First, I have to explore why I believe built environment education needs to be re-imagined.

Research question

Why do my own experiences of built environment education drive the belief it needs to be re-imagined, and how can my experience provide insights to inform current practices?

Research objectives

Through four objectives this investigation aims to answer the research question:

1. Review transdisciplinary literature within a thematic framework, exploring synergies across vocational, academic and professional environments to better understand my own personal experiences of built environment education.

2. Identify through autoethnography how my own actions, beliefs and convictions impact my practices, exploring how my own pre-conceptions have developed as a result of my vocational, academic and professional experiences of built environment education.

3. Produce meaningful personal insights developed from my experiences demonstrating an original contribution to knowledge and current practice, potentially benefitting a range of stakeholders influencing built environment education.

4. Offer recommendations for re-imagining built environment education based on my own experiences, informed by personal insights developed through this research.

These objectives could be considered broad, only capturing the general intentions of the research focus, but a preference for objectives is for two reasons. Firstly, this research asks many questions to guide this exploration through my *'lived experience'*, they provide stepping stones to guide me and are explicitly used autoethnographically. These objectives offer flexibility, as part of my research proposal they helped to conceptualise this research initially; a tool to work with as I weave backwards and forwards through this research. Secondly, this research and recommendations may interest a wider audience and benefit a range of stakeholders, an audience operating primarily in built environment education, who already may be unfamiliar with autoethnography itself.

The structure of this thesis

This project deviates from a conventional thesis structure, chapters re-positioned to where you may typically expect them; chapter titles are contextualised to suit this research, but largely reflects what you would expect within those respective chapters. This structure in my view best supports my story as it unfolds; as a scholarly piece of work, this thesis has been through continual iteration, constantly working to simplify the structure to showcase the narrative. As an artefact I feel it reflects my own evolution, it captures the essence of my journey. It wrestles with trying to break out of the structure in which it is presented, showcasing the highs and lows as it meanders back and forth through my experiences of built environment education; it requires patience from you as the reader because the *'lived experience'* is complex and messy, but it showcases why autoethnography has become the *'tool'* to conduct this research.

This chapter with chapter 2 set the scene, with knowing autoethnography will be used from the outset, a greater emphasis is on how to orientate it. I am briefly introduced with the early part of my doctoral journey outlined; the thesis title is broken down and defined; the seeds of need offers some context, outlining a perceived gap in knowledge around graduate attributes; the aim, research question and objectives have been outlined; the characters will be introduced shortly. Chapter 2 positions me, explores autoethnography methodologically, my philosophical assumptions and ethical considerations are discussed, with a focus on evaluating the method.

Chapter 3 is an autoethnographic account, inductively exploring my personal experiences of built environment education, presented through characters; a better understanding of the issues is outlined, leading to a thematic framework to guide the literature in chapter 4. A transdisciplinary review of literature within chapter 4 provides a greater focus for the following two autoethnographic chapters. Chapter 5 is informed by the inductive analysis within chapter 3 and draws on a *'conversational framework'* developed from the review of literature in chapter 4. Chapter 6 develops the story from chapters 3 and 5, it uses multiple characters to reflexively challenge my *'lived experiences'* across different periods of built environment education.

Chapter 7 outlines how my research aim and research question have been met through the research objectives, evaluating the contribution this research makes to knowledge through autoethnography, it is considered against established criteria outlined in chapter 2. Chapter 8 offers recommendations, based on the story that unfolds. This provides my contribution to practice and leads to the realisation of research objective 4, which itself directs this investigation to achieve its goal.

Characters within this investigation

"I keep six honest serving-men they taught me all I knew;
Their names are What and Why and When and How and Where and Who".

Personal Journal entry from DProf workshop (April 2017) –
extract from Kipling's The Elephant's Child 1902.

When I began my professional doctorate and attended my first workshop this quote and presentation stuck with me, connecting me quickly to my working practices. It has stayed with me throughout my doctoral journey, my *'six honest serving-men'* have become characters within this research (Fig. 1.3). Some of the characters are more explicitly used and re-introduced within autoethnographic chapters, some are not so visible; I will discuss characters further in chapter 2.

PRACADEMIC
Has worked in higher education for over 5 years, his teaching covers multiple disciplines relating to built environment education. He has extensive industry experience and continues to work in practice. He is a doctoral researcher and is both the narrator and a participant within autoethnographic chapters.

STUDENT
Graduated from university with a 1st class honours in architectural technology, one year has passed since graduation. He's a mature student who returned to study full time, has an HNC in construction and has worked in the construction industry; currently works in architectural practice.

TRADESMAN
Left school with no qualifications of noticeable grade, did an apprenticeship in carpentry and joinery getting both City & Guilds and NVQ's qualifications. Been a tradesman for over 30 years, worked on various jobs and been self-employed working on projects in both public and private sector.

ACADEMIC
Worked in academia for 2 years and is being mentored by the pracademic, now starting his doctoral journey and is few months into it. Worked in industry prior to coming to work in academia, worked in various technical and management roles; has HNC/D and a degree.

DESIGNER
Mainly is a participant observer working in the background supporting the pracademic to deliver this investigation. Some of the visual elements in this investigation comes through in the conversation other characters are having at various stages in this investigation, particularly in autoethnographic chapters.

SCIENTIST
With the designer is mainly a participant observer also supporting the pracademic in conducting this investigation. In playing largely an invisible role many insights from him are delivered through other characters, particularly in autoethnographic chapters.

Figure 1.3 – Introducing the characters (by author).

Chapter reflections and insights

From the brief introduction of me at 11 years old there is an appreciation that my journey through built environment education has followed an unorthodox path. From school report and apprenticeship to HNC, different degree experiences to this doctoral journey entwined with my *'on-the-job'* experiences comes the opportunity to reflexively delve into it. As we progress with this project it will become more apparent why, as a *'researching professional'*, the professional doctorate is the more *'natural fit'* for me and this thesis; aiding the fruition of meaningful insights within a story reflecting my *'lived experience'*. By breaking down the title of this thesis it gives some indication of scope, this research may be limited being a personal inquiry, but it will not be limited by imagination.

Autoethnography has its critics, but it offers freedom to roam which I will explore more so in chapter 2; by mobilising my experiences, going beyond my disciplinary boundaries I can explore them differently. At this stage it is difficult to suggest wholesale re-imagination is needed, making the research question, and supporting research objectives important; they provide a flexible framework to support my use of autoethnography and challenge my belief re-imagining built environment education is required.

Built environment education is influenced by two main sectors: construction and education, but they touch many more. As professionals we build the worlds and experiences of others, doing so in a world of uncertainty; with a climate emergency to address: a coronavirus pandemic ravaging lives and economies globally, with misinformation and fake news manipulating minds; paradigms are changing fast, but will the educational models? They have to, and for built environment education it is *'environment'* that is the keyword in my view; of what type of education, of whether we have the attitude to change. It appears that there is an appetite for change, reflected in government strategy, but will it bring meaningful change or lead to regurgitation of current practice? Once through the filtering process of professional bodies, institutions, and educational providers, through educators with their experience challenged; will students be given an education that will equip them with facing the challenges the 21st-century faces?

I now need to begin *'connecting-the-dots'* to consider what re-imagination means to this research, better understand autoethnography to know how best to orientate it, which I will do shortly in chapter 2. I will begin to better outline the issues of *'why'* within chapter 3, which informs the literature to explore in chapter 4; of *'how'* I move forward into the second half of this research. Doing so will help me creatively critique my personal experiences of built environment education and offer insights to challenge the status quo more so going into chapters 5 and 6.

Chapter 2 – Imagining this Investigation

This chapter provides the methodological framework; it outlines my position from the outset, leading to a deeper exploration of autoethnography to orientate my use of the method in different ways, to suit the skillset my experience brings. My philosophical position develops from my orientation of the method, which informs the strategies and methods that will be used to showcase the unfolding story moving beyond this chapter.

Ethical considerations are given particular attention to assess the risks to myself, and others that this research may impact; it outlines ways to evaluate and legitimise autoethnography itself. This chapter informs the autoethnographic stories to unfold in chapters 3, 5 and 6; it provides the foundation to safely, yet imaginatively support the story to come through the characters that were outlined in chapter 1.

Positioning myself in this investigation

As a *'researching professional'* I am not bound by the typical conventions associated in writing this thesis. Chapter placement is congruent with my doctoral journey, inclusion of an autobiographical account (chapter 3) re-positions chapters to where you traditionally expect them to be. This is for two reasons: firstly, to demonstrate my evolution in this investigation; secondly, chapter 3 inductively provides an account of my doctoral journey before research proposal approval, it guides my exploration of the literature in chapter 4 to focus the stories within chapters 5 and 6.

But I need to clarify my position before we proceed because the story of this research needs space to emerge, which I need you to appreciate. I am equipped with skills to reflexively explore and critique the culture of built environment education both as an *'insider and outsider'* (Hayano, 1979), yet within this research I am positioned firmly as an *'insider exploring my own experience'* (Fig. 2.1).
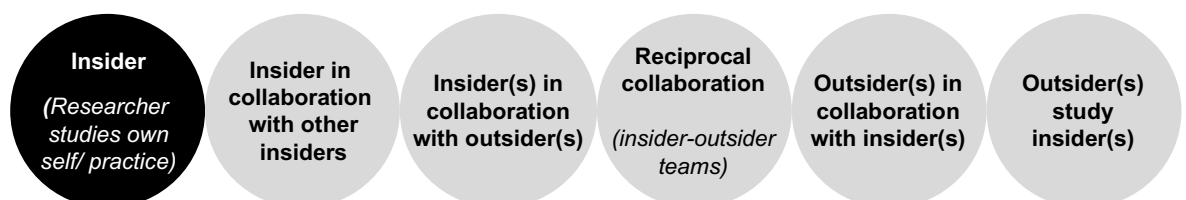
Figure 2.1 – Positionality continuum (by author, informed by Herr and Anderson, 2015, p.40)

As an insider researcher (Fig. 2.1), I cannot be separated from this research, making both context and my use of autoethnography important; it brings me into conflict with myself and others ethically. I am also an outsider observing the culture that I am in as part of my own praxis; to help me pay attention to the characters my experience offers.

In reading about writing autoethnography comes the issue of *'I'*, which can be considered *'inappropriate'* or *'wrong'* in academic writing (Adams, Holman-Jones and Ellis 2015, p.100). A *'professional'* doctorate requires reflexivity to evaluate *'self'*, my *'individual professional practice'* (QAA, 2014), central to how I am to be assessed. My knowledge is situated and contested, so there is no point in pretending I am not present.

My focus is not so much on *'I'* itself, it is on how the *'subjectivities'* (Gannon, 2016, p.228), how the characters deliver the story of this research. Goodall (2000, p.136) suggests our character is a *'rhetorical figure'*, one which is *"responsible for the narrative and accountable to readers for what the narrative says and does to them"*. Denzin (2014, p.70) states *"the goal is to write performance texts in a way that moves others to ethical action"*, not pretend that one's own voice and biases is not present as many research projects do. Being explicit about my presence, making effective use of *'I'* aids the characters to interchangably bring their own voice and support my primary narrator role; multiple characters interacting with each other through a mix of 1st, 2nd and 3rd person narration.

As a *'pracademic'* I am more attuned to scientific research approaches, but as an educator I need to reflexively challenge my experience. Simon (1996) suggests the world is more artificial than natural: *'man-made'*; for which I am creating an *'artificial'* impression of my *'lived experience'* through autoethnography, an impression *"produced by art rather than nature"* (Simon, 1996, p.4). I will look to fuse more scientific methods with autoethnography, to help evaluate *'artificial man-made artefacts'* associated with my experiences of built environment education; to help connect scholarship and my *'lived experience'* to challenge the paradigm.

Paradigms typically are applied to research (Creswell and Poth, 2018, p.18), but can bring ambiguity; Kuhn (1996) who himself is largely responsible for introducing the concept, refers to them in many ways. Guba (1990, p.17) simply refers to a paradigm as *"a basic set of beliefs that guides action"*. Discussing Kuhn and paradigms, Hayano (1979) states *"autoethnography has not produced or followed one common paradigm or one distinct theoretical framework"*; because among autoethnographers there is a *'diverse community that offer many ways of reporting and analysing information'* (Hayano, 1979), which has continued to grow over 40 years since. Autoethnography helps connect scholarship to *'lived experience'*, as a method it expands the paradigm of what ethnography is (Anderson and Glass-Coffin, 2016, p.58). Like Bochner (2016, p.52), something would be missing from my academic life if all I did was *'nourish the paradigm and stabilise the disciplinary matrix as a worker bee'*. So, to ensure I bring some authenticity and do myself and the method justice, I will explore how to use it a little further.

Having considered and outlined what autoethnography is in chapter 1, I need to start delving deeper. Chang (2008, p.47) provides a dizzying array of labels linked with autoethnography, courtesy of Ellis and Bochner (2000). It is with some *'berrypicking'* (Bates, 1989) but Fig. 2.2 brings these *'labels'* together, an overwhelming number of options available. In *'situating the method'* as Denzin (2014, p.7) suggests, labels I can relate to are placed centrally within Fig. 2.2. It would be naïve to pick a label, but I need options that aid *'reflexivity and identity negotiation'* (Berry, 2016).
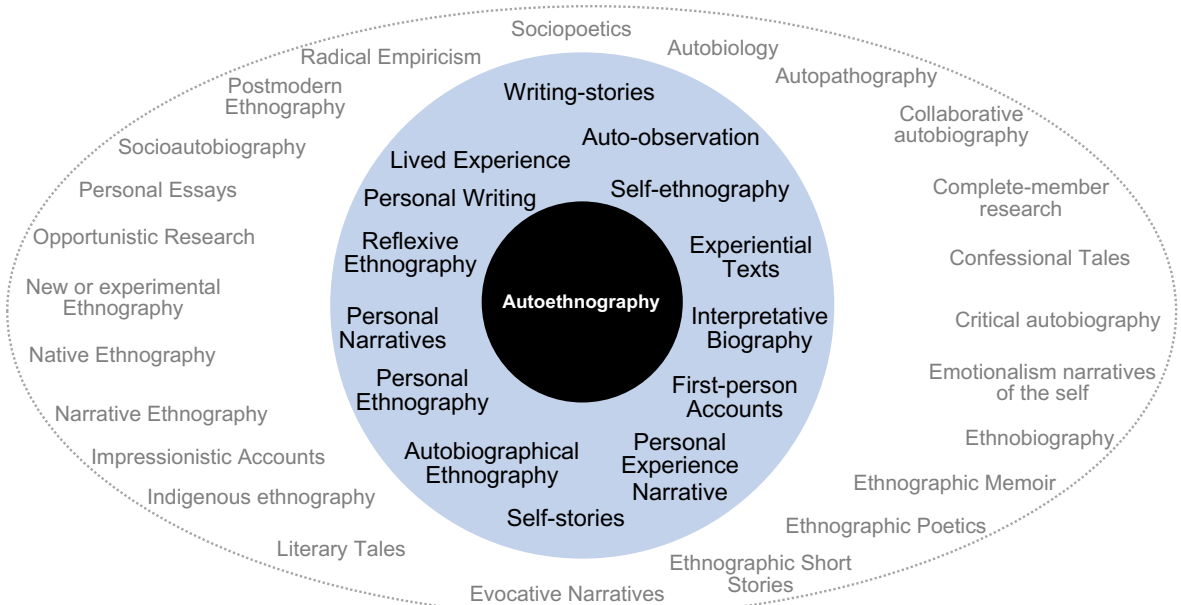
Figure 2.2 – Overwhelming number of labels associated with autoethnography.
(By author, informed by Chang, 2008, p.47: Ellis and Bochner, 2000).

Chang (2008, p.48) suggests labels within Fig. 2.2 reflects a *'diverging evolution of the genre'*, looking at autoethnography with fresh eyes I question the necessity for so many; I am looking to use it as a *'tool'*, not be hindered by overlapping *'labels'*. Autoethnography is autobiographical by nature, but I want to ensure sufficient emphasis is placed on the *'ethno'* (culture), whilst distilling down the presence of *'auto'* (self).

Van Maanen (2011) offers three *'tales'*: *'realist', 'impressionist'* and *'confessional';* ways to represent fieldwork experiences, cultures, us and others. Confessional*, or 'expressionist'* tales Adams, Holman-Jones, and Ellis (2015, p.84) call it, focus more on first-person narration and the researcher, with less or little emphasis on culture; *'Realist tales'* focus more on culture, less so on the researcher; *'Impressionist tales'* merges confessional and realist tales placing equal focus on both the researcher themselves and culture. At this stage I am leaning more towards a *'impressionist tale'* but with a *'realist'* bias to explore *'auto'* and *'ethno'* to showcase my *'lived experience'*.

I will re-visit Van Maanen's *'tales'* but want to focus on *'situating the method'*; Denzin (2014, p.7) makes an important point that despite writing about personal experiences it comes with consideration of others (Tolich, 2010). Gergen and Gergen (2002) suggest by using myself I am *'free of the traditional conventions of writing'*. Denzin (2014, p.7) offers conventions of writing an autoethnography, something to inform the *'berrypicked'* labels in Fig. 2.3; writing with others in mind; that sometimes what we write is grounded in family trauma; inclusive, but explicit about biases; it is from an assumed position of knowing we can write about self; objective and subjective markers reflect key critical points in our lives.
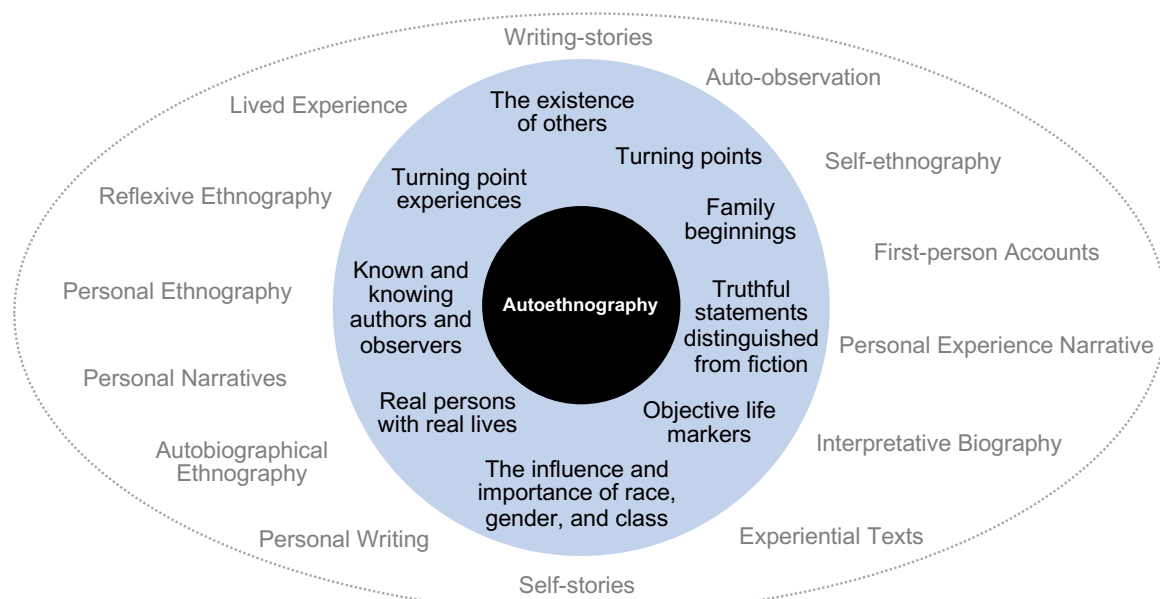
Figure 2.3 – Situating the method and considering writing conventions to express narratives about life experiences. (By author, informed by Denzin, 2014, p.7 and Fig. 2.2, p.17).

Thoughts are with *'the existence of others'*, of being a *'knowing author'* Denzin (2014, p.9). Clandinin and Connelly (2000, p.176) highlight ownership; although I am the storyteller, do I solely own what I write? I may have some freedom in what I write but must consider ownership and impact to others; I need to be critical of the culture within built environment education, whilst being respectful to others in the account of my own personal experience.

What Clandinin and Connelly (2000, p.177) highlight importantly is not so much ownership of the story, but my responsibility in telling it, relational ethics; a *'reciprocal relationship of mutual responsibility and care'* (Adams, Holman-Jones and Ellis, 2015, p.35), one shared with family, friends, students, colleagues, and others we may impact. As a *'knowing author'*, I am inclined at this stage to lean towards a *'label'* that reduces the impact to others, that still sufficiently connects myself to the culture within built environment education and the characters; a leaning more towards *'Autobiographical Ethnography'*, but possibly more so *'Lived Experience'* (Fig. 2.3).

The '*objective and subjective markers*' that Denzin (2014, p.9) outlines, draws me to Chang (2008, p.46) highlighting '*opposing camps*' in how to do autoethnography. These '*opposing camps*' relate to how autoethnography should be conducted between '*analytical, theoretical and objective*', and '*evocative and subjective*'. Chang (2008, p.46) refers to Denzin and Ellis as sitting in the "*evocative*", subjective camp of how to conduct autoethnography '*tug-of-war*'; with Anderson (2006) sitting in the more objective '*camp*' with a more theoretical and analytic approach. Snyder (2015, p.93) questions the benefits of thinking of it as a debate, preferring Ellis and Bochner's (2000, p.740) '*triadic continuum*' of auto *(self)*, ethno *(culture)* and graphy *(process)* and the visual mental image it creates; I feel it unnecessary to enter this debate now or to reside in one particular '*camp*', the '*triadic*' discussion offers more immediate interest (Fig. 2.4).
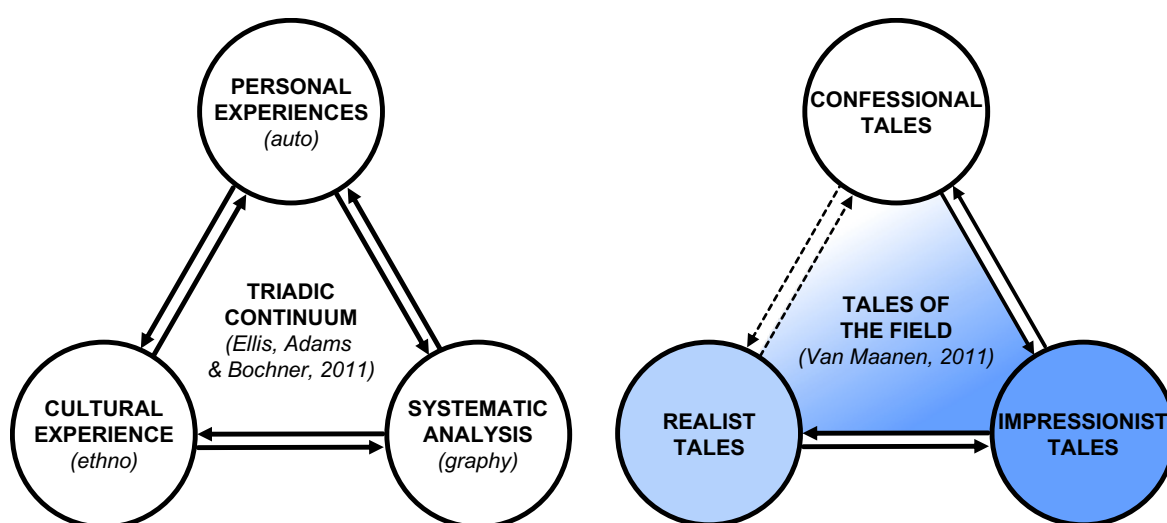
Figure 2.4 – Comparisons between "triadic continuum and 'Tales of the Field'.
(Graphically represented by author).

Fig. 2.4 presents Ellis, Adams and Bochner's (2011) '*triadic continuum*' and Van Maanen's (2011) '*tales*' graphically. Chang (2008, p.48) refers to Ellis and Bochner (2000, p.740) to highlights the complexities of autoethnographic variety, that autoethnographers do place different emphasis on the '*three axes of the triadic continuum*' (Fig. 2.4). I think what Ellis, Adams and Bochner (2011) provide is useful, but comparison with Van Maanen's (2011) '*tales*' (Fig. 2.4) makes the '*triadic continuum*' more useful for me.

An '*impressionist tale*' (Fig. 2.4) allows me to shift the emphasis from '*auto*' and '*ethno*', to focus more on the '*graphy*' (process). '*Confessional*' and '*realist tales*' more so are integral to delivering '*personal insights*' to critique built environment education; an '*impressionist tale*' is a priority, creating an '*impression*' of my experience. Rather than debate in which '*camp*' to reside, it is through '*systematic analysis*', that my own '*impressionist tale*' can begin to unfold and bear fruit potentially.

Van Maanen (2011, p.102) states an *'impressionist's tale'* is a *"representational means of cracking open the culture and the fieldworker's way of knowing it so that both can be jointly examined"*, a means of exploring *'self'* within the culture of my *"own people"* (Hayano, 1979). Hayano (1979) states *"the problems of autoethnography are the problems of ethnography compounded by the researcher's involvement and intimacy with his subjects"*, a key strategy of ethnography is participant observation.

By using autoethnography I am totally immersed, a full participant as well as an observer. With *'impressionism'* I can '*create an impression of an experience, rather than true and certain reproduction of it'* (Adams, Holman-Jones and Ellis, 2015, p.84), this is important because I did not start my DProf journey intending to research *'self'* and the culture I am immersed in. My personal experiences bring a unique perspective, but professionally I am uncomfortable with write in a solely *'confessional'* or *'realist'* way: *"We do not speak from nowhere"* (Gannon, 2016), it is near impossible to disguise others (Trahar, 2013).

Committing to a more *'impressionist'* approach I am importantly still sitting within the *'labels'* I have outlined, offering plenty of scope to be creative with this investigation. Van Maanen (2011, p.105) suggests characters in impressionist tales *"must be given names, faces, motives, and things to do if a story is to be told about them"*. However, as outlined in chapter 1 generic terms are deliberately used for characters, my reasoning primarily is considering the audience; how my story resonates with you. A focus moving into autoethnographic chapters is on mixing up the different perspectives and experiences of the characters; a chronology of events does not need to be arranged sequentially when you control multiple voices of *'self'*. So, with an *'impressionist tale'* there is scope for the characters; however, I only want them to reflect different time periods and to help me unlock insights from the range of data I have.

Adams, Holman-Jones and Ellis (2015, p.88) also outline another *'form'* of representing autoethnography: *'conceptualism'*, a means to *"re-imagine the role of the artist in culture"*; *"innovators who create new and often unexpected ideas, perspectives, and experiences"*. Van Maanen's (2011, p.105) point about characters makes me reflect on the possibilities, *'conceptualism'* appeals; characters are integral *'cogs'* but should remain largely faceless in my view. A conceptualist approach offers a blank canvas; an opportunity to go beyond my own disciplinary world (Chang, 2016, p.120) and not be limited as a *'pracademic'*. Chang (2008, p.48) argues the *'triadic balance'* of autoethnography should be ethnographic methodologically; interpretative culturally; and autobiographical in content. Through a conceptualist approach I can sit on this *'methodological fence'* between two *'camps'* and take in the view (Anderson, 2006).

There is a perception the objective and analytic, *'dark side of the force'* of autoethnography, is dominated by the *'evocative'* side (Anderson, 2006; Kennedy et al, 2019). Anderson (2006) widely acknowledged with proposing *'analytic autoethnography'* and its five key features, which I will come to, questions the compatibility of evocative autoethnography with more traditional practices of social inquiry. Anderson (2006) acknowledges that *'symbolic interactionists'* Ellis, Bochner, Denzin and Richardson raised the profile of autoethnography, he praises the articulation of a theoretical paradigm for the form they promote but raises concerns about its impact on other forms of autoethnography. As a *"methodological fence-sitter"*, I see Anderson's point, but I am not convinced enough to split hairs and get off the fence yet. Anderson (2006) highlights the toing and froing of critiques between evocative and analytic, *'realist'*, ethnographers, I will let others continue to debate this because I want to briefly re-visit ownership.

Chang (2008, p.69) highlights our *'multi-faceted roles as researcher, informant and author'*, we do not live in a *'vacuum'* and have *'visible and invisible participants in our stories'* to consider; making me think of Clandinin and Connelly's (2000, p.176) point about ownership. Anderson (2006) highlights issues with re-telling *"emotionally wrenching experiences, such as illness, death, victimization and divorce";* I want to embrace areas that challenge but look forward more*.* These may be stories to share, but as Winkler (2017) highlights *'ethno'* is a distinguishing difference between autoethnography and autobiography. In seeking out doctoral theses generally, there are interesting topics which authors call autoethnography, that become uninteresting because of how the stories are presented. If they do move beyond *'self'*, do they sufficiently consider the *'knowing and known authors and observers'*, *'the existence of others'* (Denzin, 2014, p.7) highlighted in Fig. 2.3 (p.18); it has to be said for some it is questionable. What is the impact after the story is told; for both the *'known'* and *'unknowing'* authors and observers?

From reading a few autoethnographic theses within construction, Grosse (2018) provides a *'confessional tale'*, explicitly acknowledges *'the other'*, and a willingness to maintain a future relationship. The language resonates, a *'realist tale'* balancing the *'evocative'* and *'analytic'*. It could be said the *'core ideals'* of autoethnography have been met (Adams, Holman-Jones and Ellis, 2015, p.25). However, Grosse (2018) suggests '*the other'* has an awareness they are being written about; in respect to informed or process content, even retrospectively, it would be interesting how this *'tale'* would fair ethically under scrutiny from Tolich (2010). Others may be more critical, but I think Grosse (2018) showcases how a researcher's skills and experience moulds autoethnography, and as Hayano (1979) states *"autoethnography is not a specific research technique, method or theory"*: it is a *'tool'* to hone and complement the individual's own *'toolbox'* and experience.

Winkler (2017) highlights a need for a more balanced argument to bridge the *'two camps'* of autoethnography, both construction and education are *'fragmented and siloed'* enough; it seems futile to split autoethnography itself. However, the *'realist'* more analytic side of autoethnography appeals, offering a better connection to my skillset in my view. The key features of *'analytic autoethnography'* Anderson (2006) offers seem like common sense, reflexivity does not need *'analytic'* in front of it; I am committed to providing sufficient theoretical analysis; which will become more clearly visible in the narrative as we progress; I am constantly informed by others, the impact of which I will explore later in this chapter. This leaves my status as a complete member researcher (CMR), which is important to appreciate as I look to creatively explore the personal and cultural in my experience (Bartleet, 2016, p.444).

Anderson (2006) refers to Adler and Adler (1987) extensively, firstly to highlight types of CMR: *"opportunistic"* and *"convert"*. It is difficult to place myself as an opportunistic CMR, I have *'acquired intimate familiarity'* through working in built environment education; as a convert CMR, someone with nearly 30 years career experience working in the construction industry, only during my doctoral journey have I become *'completely immersed'*. This near 30 years includes periods of education within it, only now being unpacked because of an *'opportunity'* that presents itself doing this research. But it seems futile to split CMR status this way; however, it brings into focus once more my positionality. As a *"self-as-researcher"*, I need to acknowledge and explicitly outline biases and pre-conceptions that I as a *"self-as-subject"* bring to autoethnography and this research (Throne, 2019, p.28); which I will do. While reflexivity and autoethnography are integral, Moors (2017) reminds us reflexivity alone is not sufficient to show transparency in my positionality as a researcher; so, in explicitly using characters it aids my positionality, whilst using my reflexive voice in a *'conceptualist tale'* to creatively re-tell what I am comfortable putting in the public domain (Anderson, 2006; Tolich 2010).

It is *'Conceptualism'* that helps bridge two different *'camps'*. In seeking to re-imagine built environment education I can use both the *'evocative'* and *'analytic'*, balance '*confessional, realist and impressionist tales'*; provide sufficient cultural and theoretical analysis; distil my voice and showcase multiple character voices within an unfolding story; whilst ethically considering the *'others'* (Tullis, 2016, p.248). Goodall (2000, p.136) says *"the soul of good ethnographic writing"*, is to pay attention to the characters, their personas; how the language opens up and creates intimate relationships between them, that the dialogue between them delivers verisimilitude. For me this is key to the success of this project, knowing how I am going to use autoethnography requires a better understanding of epiphanies to showcase the story of this research moving forward.

It is in epiphanies, *'transformative moments'*, that I am beginning to piece together aspects of my experience to illuminate more general cultural phenomena (Holman-Jones, Adams and Ellis, 2016, p.23); to unlock insights from my built environment education. Denzin (2001, p.37: 2014, p.52) highlights four forms of epiphany.

1. *The major epiphany – an event which touches every fabric of a person's life*
2. *The cumulative or representative epiphany – an event which signifies eruptions or reactions to experiences which have been going on for a long period of time.*
3. *The minor/illuminative epiphany – which symbolically represents a major, problematic moment in a relationship or persons life.*
4. *The relived epiphany – episodes whose meanings are given in the reliving of the experience.*

Unsure where to place my *'transformative moments'*; do Denzin's *'forms'* just demonstrate an overthinking of epiphanies, is there not only one in reality? Epiphanies aid the transition from the *'autobiographical to the cultural'* (Rodriquez, et al, 2017); help unlock my *'personal and professional'* experiences of built environment education. In my view to understand my own experiences and personal insights means not over-complicating research but use epiphanies to *'bring dignity and meaning'* (Denzin, 2014, p.25) to this investigation as the story unfolds.

Periods of formal study I consider as *'cumulative'*, why? They bring coherence to previous experiences. But the period of study alone does not create the epiphany, there is a *'plurality of events'* (Cates, 2015), my doctoral journey brings moments that help to '*connect dots'* between past experiences to this thesis. However, we must not lose sight of the fact that the series of '*re-lived epiphanies'* applies to the context of this thesis only (Kundera, 1988). It is through dissecting journals and fieldwork notes, old coursework, and other data; in the re-telling of my experiences an account reflective of culture is offered, through its characters and how they and you connect with this thesis.

By taking Adams, Holman-Jones and Ellis' (2015, p.77) advice I can explore themes, subtly use characters and carefully select an appropriate narrative to *'re-live'* my experiences. In doing so I can re-tell the stories of my *'lived experience'* and bring it into the context of this current period of my life, using autoethnography to creatively nuance different periods of my built environment education together. However, there is a need to ensure I reflexively give *'everything but the kitchen sink'* as Etherington (2004, p.38) recommends. This brings me to *'minor/illuminative and major'* epiphanies, they appear to describe the same thing. A *'transcendent epiphany'* (Anderson and Glass-Coffin (2016, p.78) sounds more useful, those that provide an end and a new beginning; *'those that are etched into the fabric of one's life'*, which I will seek to crystallise as we progress.

Adams, Holman-Jones and Ellis (2015, p.89) outline ways of articulating the relationship between theory and story: *'theory explains the nuances and happenings of a culture; story illustrates and embodies these nuances and happenings'* to understand how I am thinking with and through them; as conjecture or postulate. '*Autoethnography puts theory into action'* to challenge my beliefs, practices, and ways of understanding my experience. I need to challenge my beliefs and experience by going beyond what any epiphanies offer, beyond the typical disciplinary boundaries that come with my built environment education; it is difficult to re-imagine it otherwise without doing so.

Douglas and Carless (2016, p.92) suggest *"epiphanies can serve as a beacon which illuminates anew"*, that they can *"cut through the clutter of day-to-day of life as a researcher, academic and student"*; help legitimize autoethnography to address issues with experiential validation (Usher et al, 1997). In talking of legitimizing autoethnography it is with considering the increased scrutiny it attracts, of developing practices aligned with relevant standards and benchmarks to aid evaluation of it (Hughes and Pennington, 2017).

In re-imagining my experiences and re-visiting moments of my personal transformation at different times, I can showcase how scientific autoethnography can be (O'Hara, 2018). My transformative moments are backed up with a range of different data sources, personal journals, fieldwork notes, coursework and certificates spanning 30 years, phone data; supported by secondary external data amassed from different periods of built environment education. I have a range of artefacts to explore and better understand, which as this research moves forward will help fuse together a range of epiphanies from different periods; crafted into a narrative of what my *'lived experience'* represents in the context of this thesis. It is in the study of artefacts I will seek methods from other fields to better understand them, informed by preliminary research early in my doctoral journey.

It is in historical, institutional, and cultural arenas surrounding our lives that epiphanies occur and are located (Denzin, 2001, p.37). Denzin (2016, p.129) outlines three concerns when an *'emphasis is on self, biography and experience'*, concerns of *'performance, of process, and/ or analysis';* that epiphanies can help focus both process and analysis, in the *"specific lives of individuals who live the process that is being studied in order to locate their lives in their historical moment".* Epiphanies form part of the process as I navigate my way through my built environment education. Using autoethnography has brought more focus to my fieldwork practices, in reflecting on the data available to me, I am drawn to thoughts on how I have been assessed at different times and how it influences how I assess others as an educator; however, first I need to consider how to structure my writing to best showcase my data and support the characters.

Writing autoethnography to support characters in this investigation

I am blessed with a significant amount of data in various forms, covering a significant period; however, I need to begin to work through this data and analyse it. Chang (2008, p.131) offers ten useful strategies (below) to help analysis and interpretation, I outline them here, but I can only demonstrate their benefit as I begin to write autoethnographically; it just also highlights the need to have a greater understanding of the *'tools'* to write and represent autoethnography more effectively.

1. *Searching for recurring topics, themes, and patterns.*
2. *Looking for cultural themes.*
3. *Identify exceptional occurrences.*
4. *Analyse inclusion and omission.*
5. *Connect the present with the past.*
6. *Analyse relationships between self and others.*
7. *Compare yourself with other people's cases.*
8. *Contextualize broadly.*
9. *Compare with social science constructs and ideas.*
10. *Frame with theories.*

We all have *'tools'* to which we become accustomed, but I need to acquire and learn new ones. Adams, Holman-Jones, Ellis (2015, p.79) talk about how autoethnographers should consider when, why and how to use characters in dialogue; in doing so they refer to Stephen King (2012) who takes me on a journey through the *'toolbox'*. It is a journey offering great advice for organising my *'toolbox'* (King, 2012, p.119), the different layers, use of active and passive verbs, *"that the paragraph, not the sentence is the basic unit of writing"* in his opinion (King, 2012, p.152). Faced with the daunting task of learning new tools such as reflexivity, prose, verisimilitude, and reciprocity King (2012, p.129) states:

> *"One of the really bad things you can do to your writing is to dress up the vocabulary, looking for long words because you're maybe a little ashamed of your short ones."*

Through all the great advice, it is the analogies, continual reference to *'tools'* that resonates; in learning new *'tools'* King (2012, p.132) suggests it is just a case of *"cleaning off the rust from the drill bits and sharpening the blade of your saw."* As somebody that has developed from a trade background, who *'learns-by-doing'*, the reality is this is more than just *'cleaning off rust'* and *'sharpening of tools'* to deliver what you are now reading. King (2012, p.153) offers simple guidance, *"words create sentences; sentences create paragraphs; sometimes paragraphs quicken and begin to breathe."* In discussing the third level of the toolbox King (2012) continues:

> *"Carpenters don't build monsters, after all; they build houses, stores, and banks. They build some of wood a plank at a time and some of brick a brick at a time. You will build a paragraph at a time, constructing these of your vocabulary and your knowledge of grammar and basic style. As long as you stay level-on-the-level and shave even every door, you can build whatever you like – whole mansions, if you have the energy."*

All-in-all what King (2012) offers serves as a reminder not to forget what we are, and where we come from. It is in our hands to craft and shape what we become and know when to *'clean the rust off'* and *'sharpen the tools'*; knowing when to change, or *'trade'* them in. There is freedom in writing autoethnographically, Gergen and Gergen (2002, p.14) state as *'autoethnographic exemplars'* it is in:

> *"one's unique voicing – complete with colloquialisms, reverberations from multiple relationships, and emotional expressiveness – is honoured. In this way the reader gains a sense of the writer as a full human being."*

So, I need to *'sharpen up'* on reflexivity, prose, verisimilitude, reciprocity, beneficence moving forward; look at areas such as process consent and relational ethics to support my writing. In *'drilling'* down further I need to explore what reliability, validity and generalisability means to autoethnography in the context of my own story. By combining the *'confessional, realist, impressionist and conceptual'*, developing my own style (Chang, 2008, p.148) I can showcase the characters; but ensure I do it safely and ethically which I will expand on later within this chapter.

It is important to acknowledge autoethnography is also a reflexive collaboration between author and reader (Coffey, 2017); which *'seeks out and articulates outcomes in an ongoing and developing process, which allows for momentary conclusions and further and on-going reflections'*. Reflecting on the immediate points within this chapter so far, I come back to the *'core ideals'* of autoethnography that Adams, Holman-Jones and Ellis (2015, p.25) outline; my thoughts are with evaluation and what the method should aspire to be. Adams, Holman-Jones and Ellis (2015, p.102) re-visit these *'core ideals'* in providing *'goals for assessing autoethnography'* which include:

- *Making contributions to knowledge.*
- *Valuing the personal and experiential.*
- *Demonstrating the power, craft and responsibilities of stories and storytelling.*
- *Taking a relationally responsible approach to research practice and representation.*

These *'core ideals'* offer something to guide my initial writing in chapter 3, a means to better introduce the characters; to become attuned to the different voices I bring to this research. They offer a means to strategize and interpret my *'lived experience'*, to develop my own style and refine my focus. This allows you to gain a greater insight into the process of me figuring out where my focus is within chapter 3, how it informs my review of literature in chapter 4, to further focus later autoethnographic accounts in chapters 5 and 6. These *'core ideals'* for my purposes are possibly not sufficient to assess this doctoral study, I will explore how to evaluate the method later in this chapter. Having outlined how I will look to orientate my use of autoethnography through a *'conceptualist'* approach, I now feel more comfortable discussing how I position myself more philosophically.

Epistemologically, Ellingson and Ellis (2008, p.448) see autoethnography as a social constructionist endeavour, Reed-Danahay (1997, p.2) sees it as a postmodernist construct; one with a double meaning in either exploring *'one's own group'*, or autobiographically to focus on *'self'* to echo Hayano (1979); hybridity important to embrace. Creswell and Poth (2018, p.35) usefully compare a range of paradigms, Fig. 2.5 focuses on four to orientate my use of autoethnography; my observations underline each, drawing me to pragmatism more than social constructivism and postmodernism.

	Ontological beliefs	Epistemological beliefs	Axiological beliefs	Methodological beliefs
Postpositivism	A single reality exists beyond ourselves, *"out there"*. The researcher may not be able to understand it or or get to it because of absolutes.	Reality can only be approximated, but it is still constructed through research and statistics. Interaction with research subjects is kept to a minimum. Validity comes from peers, not participants	The researcher's biases need to be controlled and not expressed in the study.	Scientific method and writing is used. Object of research is to create new knowledge. Method is important, such as testing of theories, specifying important variables, and making comparisons among groups.
	Ontologically limiting, epistemologically constructing reality but not in this sense, biases will be expressed, methodologically incompatible.			
Social constructivism	Multiple realities are constructed through our lived experiences and interactions with others	Reality is co-constructed between the researcher and the researched and shaped by individual experiences.	Individual values are honoured and are negotiated among individuals.	More of a literary style of writing is used. Use of inductive method of emergent ideas (through consensus) is obtained through methods such as interviewing, observing, and analysing texts.
	Ontological and epistemological synergies, negotiating values is more a internal conversation, methodological possibilities.			
Transformative/ postmodern	Participation between researcher and communities or individuals is being studied. Often a subjective-objective reality emerges.	There are co-created findings with multiple ways of knowing.	There is respect for indigenous values; values need to be problematized and interrogated	Methods consist of using collaborative processes of research, encouraging political participation, questioning of methods, and highlighting issues and concerns.
	Ontological possibilities, epistemological and axiologically aligns with this investigation, methodological possibilities to inform ideas.			
Pragmatism	Reality is what is useful, is practical and *"works"*.	Reality is known through using many tools of research that reflect both deductive (objective) evidence and inductive (subjective) evidence.	Values are discussed because of the way that knowledge reflects both the researcher's and the participant's views.	The research process involves both quantitative and qualitative approaches to data collection and analysis.
	Ontologically goal-focused, epistemologically needs to include abductive and praxis, axiologically aligns, offers methodological flexibility.			

Figure 2.5 – Paradigm comparisons (adapted from Creswell and Poth, 2018, p.35)

Adams, Holman-Jones, Ellis (2015, p.82) state *"any story we construct is partial, privileged, and rhetorically crafted for an audience"*, social constructivist and postmodernist paradigms axiologically offer synergies with pragmatism. As a *'pracademic'* I am more *'empeiria'* than *'episteme'*, I embrace both to nuance my experience and *'know-how'* with my increasing theoretical knowledge (Hickman, 1992, p.17); mutability an important feature of my evolving pragmatic journey. Harasim (2017, p.6) suggests epistemology can be a powerful *'tool'* if embraced by educators, because it not only aids discussion of learning theory with learners, it also informs our own view of learning and teaching. In respect to my own *'epistemological development'* (Moon, 2005) it is important to consider my role as a learner and educator, the multiple ways of *'knowing'* I bring to this research.

Baxter Magolda (1992) offers *'absolute, transitional, independent and contextual'* ways of *'knowing'*; epistemological awareness grows as we progress, a *'developmental process'*. My epistemological reality is *'complex and messy'* (Minge, 2016, p.428), changing as my identity shifts, my doctoral journey an influence. My experience is framed within a *'man-made'* artefact (thesis), constructed differently to how I have naturally developed; memories of experiences can bring out bias, requiring a pragmatic mindset to evaluate it.

Wellington (2015, p.91) suggests there is a danger of moving too much towards *'extreme epistemic relativism'*, meaning *'anyone's knowledge is seen as having equal status to anothers'*; I view all knowledge as equal in balancing *'know that/ know-how'* (Barnett, 1994, p.160). Some professions may have a perceived higher status in respect to knowledge, but ontologically my *'becoming'* is focused on *'contextual'* understanding. We train to *'become'* professionals and maybe knowledgable, but transmitting the *'absolute'* to the *'contextual'* can get lost in translation; it is the application of skills that makes transmitted knowledge useful within a *'contextual'* reality. Exploring *'contextual'* ways of knowing is important, because of how *'folk knowledge'* can impact built environment education (Powers, 2017, p.26). Philosophically ignorant at the beginning of this doctoral journey, my *'epistemological development'* seeks to be more *'absolute'* in exploring what I subconsciously knew at different times; from a pragmatic viewpoint of *'knowing'* drawn from my *'real world'* experiences, however *'there's a point where we have to stop asking what is really real and get on with life'* (Cherryholmes, 1992).

There is a degree of *'unknowability'* because some forms of my knowledge presents itself in *'unpredictable ways',* hard to explain how I have come to know (Pickering, 2011, p.23). Dewey's pragmatism can help overcome this (Biesta, 2010, p.96), by embracing *'various possible lines of action'* (Dewey, 1922, p.132), that emerge from *'doing'* autoethnography. This encapsulates how I orientate my use of autoethnography; it moves back and forth through the narrative and my *'lived experience'* (Ellis, 2004), it can work across different disciplines; it can also potentially change these disciplines, which I am keen to explore in this research. Axiologically, I accept this may challenge others with traditional disciplinary mindsets and who question or value autoethnography as a method.

By using autoethnography my *'real-life'* experience is being *'artificially'* re-imagined; I am ontologically engineering mixed-realities, *'impressions of reality'* (Adams, Holman-Jones and Ellis, 2015, p.84) as I unpack the story of my *'lived experience'*. Crease and Goldhaber (2015, p.169) refer to cubist artists such as Picasso, who *'lay down a multiplicity of views from different directions in a single canvas'*; which is what I am doing by dissecting my built environment education.

Praxiology can be overlooked in philosophical discussions, Toyosaki and Pensoneau-Conway (2016, p.560) suggest this is possibly as a result of training to meet *"academic"* conventions; it needs considering, particularly if we consider my route in coming to work in academia. Praxiology can be understood as a *'theory of practical knowing'*; Pierre Bourdieu accredited with making a significant contribution, primarily in overcoming dualisms of structure and agency (Coghlan and Brydon-Miller, 2014). Ryan, Nahser and Gasparski (2002, p.13) discuss subtle differences between praxiology and pragmatism, stating *"praxiology is an uniquely Central European philosophical movement; pragmatism is an uniquely American philosophical movement"*, but continue to highlight how *"praxiology and pragmatism are interwoven in their concern for human action"*. Gasparski (1983) offers a praxiological design theory/ methodology, which builds on the work of Kotarbinski; this would only distract to explore further.

Pawson (2013) suggests *'pragmatism rapidly becomes unmanageable and, ironically, impractical and unfeasible; that solutions can be 'piecemeal' and difficult to evaluate';* Pawson (2013, p.72) *states "methodological pragmatism bursts evaluation at its seams"*. You may view this research as *'piecemeal',* but I would suggest *'all the pieces will serve up a good meal'*, that the story represents the nature of my *'real world'* experience, one focused on outcomes of action, not pursuit of truth (Patton, 2015, p.152). Toyosaki and Pensoneau-Conway (2016, p.559) highlight how:

> *"A praxiological and ontological approach allows us to demonstrate our understanding of autoethnography as the praxis – as a theoretically informed practice – of social justice within three different micro and macro-ontological contexts: an intersubjective context, a relational context, and a community context."*

Toyosaki and Pensoneau-Conway (2016, p.560) suggest it is in *"doing"* autoethnography through praxis we gain a better sense of self, helping us demonstrate how we come to know *(epistemology)*, evaluating how we know *(axiology)*, leading to what we *'become' (ontology)*; my insights come in the *'doing'*. Rothbard (2011, p.60) states:

> *"Praxeology rests on the fundamental axiom that individual human beings act, that is, on the primordial fact that individuals engage in conscious actions toward chosen goals. This concept of action contrasts to purely reflexive, or knee-jerk behaviour, which is not directed towards goals."*

It is important to note research objectives (RO) 1-3 (p.11) can be achieved through reflexive means but, RO4 (p.11) drives this research. Reflexively a contribution to knowledge can be made (RO1-3), but in offering any recommendations (RO4) to re-imagine I need to go beyond what already exists now to make my contribution to practice. Reflexivity alone is not sufficient; its value can be over-exaggerated (Moors, 2017), my own praxis *'scaffolds'* my reflexive voice.

Fig. 2.6 adapts Creswell and Poth (2018, p.20): I include praxiology to help crystallise my position philosophically. Praxis offers direction, more so than any epistemological position I may claim; *'what I know'*, *'how I know it'* and *'what I've learnt through doing'*, feels more useful than *'how I came to know'*. Through combining autoethnography and design science, which I will come to, the interface between *'natural'* and *'artificial'* can be explored; between me and *'artefacts'* created by others within my built environment education. It is *'techne'* that brings *'empeiria'* and *'episteme'* together; *'technology fusing various parts so something novel can be created, but which draws on both the theoretical and practical whenever and wherever they are effective'* (Hickman, 1992, p.18).

		Questions	Characteristics	My position in this investigation
PHILOSOPHICAL ASSUMPTIONS	Ontological	What is the nature of reality?	Reality is multiple as seen through many views.	Multiple realities are presented through my multiversal perspectives of *'self'*. A hybrid ontological approach is augmented by technology that enhances my world view of reality, but which brings an element of *'unknowing'* in how it creates knowledge.
	Epistemological	What counts as knowledge? How are knowledge claims justified? What is the relationship between the researcher and that being researched?	Subjective evidence is obtained from participants; the researcher attempts to lessen the distance between himself or herself and that being researched	My knowledge is situated and contested; embedded knowledge offers a potential means to negate and authenticate claims. Could be insider/ outsider; but I am an emic researcher researching my own personal and professional self within the culture of built environment education.
	Axiological	What is the role of values?	The researcher acknowledges that research is value-laden and that biases are present in relation to their role in the study context.	As a *'convert complete member researcher'* this research draws on my experiences within the culture of built environment education. As a 2nd career *'pracademic'* an outsider perspective brings biased viewpoint which needs to be challenged reflexively.
	Praxiological	What do we know? How do we know it? How do we learn from or about what we know?	The researcher uses any logic relevant to study the topic within its context, through practical knowledge and *'knowing-how'* not just knowing about.	Epistemologically a pragmatic *'know how'* viewpoint to this investigation asks: what does it enable us to do? My practical knowledge provides action through inductive, deductive and abductive logic; which requires reflexive challenge.
	Methodological	What is the process of research? What is the language of research?	The researcher uses inductive logic, studies the topic within its context, and uses an emerging design.	Research is emerges inductively from experience of built environment education, theory is thought of as conjecture/ postulate. Research takes a transdisciplinary approach to answer the research question, bring rigour to research and support autoethnography

Figure 2.6 – Philosophical assumptions and implications (by author, adapted from Creswell and Poth, 2018, p.20).

Fig. 2.6 highlights the importance of praxis, outlining the practicalities of actually *'doing'* autoethnography; that it is a *'tool'* that moulds to the individual researcher and aligned to suit my way of *'knowing'*, *"the writing writes the writer"* (Gannon, 2006). Methodologically it needs to be appreciated this project still needs space to emerge from unpacking my data, that I am trying to maintain a degree of flexibility at this point. From this it means I can creatively begin to explore my experience, combining inductive, deductive, and abductive logic to *'connect-the-dots'*; for which I need to set out how the strategies and approaches to support this research.

Research strategies and qualitative approaches to orientate autoethnography

It is important to appreciate my doctoral journey began two years prior to this investigation commencing, chapter 3 will inductively help to better set the scene autoethnographically; in doing so my personal experience and insights inform the design strategy in Fig. 2.7, informing the review of literature in chapter 4. This period prior to commencing has informed the design strategy (Fig. 2.7), deeming naturalistic inquiry inappropriate; data from earlier stages in my DProf is now being manipulated and re-worked through autoethnography in this investigation. Ethical issues need clarification, as a *'convert CMR'* (Anderson, 2006) some of the data being analysed came as a result of seeking a research focus; it was not originally thought of as being the *'data'*. This investigation benefits from being *'information rich'*, purposeful sampling I considered unnecessary with how I am using autoethnography, a significant amount of data was already collected over a 30 year-period, but never analysed (Fig. 2.7).

Research Strategies to conduct this investigation	Design Strategies			Data Collection and Fieldwork Strategies				Analysis and Reporting Strategies				
	Naturalistic Inquiry	Emergent Design Flexibility	Purposeful Sampling	Qualitative and Quantitative Data	Personal Experience and engagement	Empathetic neutrality and mindfulness	Dynamic systems perspective	Unique Case Orientation	Inductive Analysis and Creative Synthesis	Holistic Perspective	Context sensitivity	Reflexivity: perspective and voice
My position in respect to research strategies for this investigation	Purposeful sampling unnecessary. Naturalistic inquiry unsuitable because data is being manipulated and controlled to suit story. **Emergent design flexibility** helps this investigation as a deeper understanding of experience develops.			**Empathetic neutrality** is limited as judgements are made on data collected, being mindful is important. Both **qualitative and quantitative data** will be collected and utilised. **Personal experience and insights** are central to this investigation. A **dynamic systems perspective** focuses on process of ongoing change; of an individual in this case.				**Unique case orientation** is applicable to this investigation being through autoethnography. **Inductive analysis** sets scene; deductive and abductive logic aid **creative synthesis**. **Holistic perspective** considers both dual role of theory and practice to deliver synergy. **Contextual sensitivity** brings consideration beyond this investigation once completed. **Reflexivity** itself needs to be challenged.				
Ethical considerations	Prior to and beginning to conducting study			Data collection prior and during the study conducted				Analysis and reporting of data during this study conducted and when it's published				

Figure 2.7 – Research strategies to aid design, data collection, analysis and synthesis. (Adapted from Patton, 2015, p.46).

The design of this research emerges as I begin to *'do'* autoethnography, which emerged from my doctoral journey itself, I will be utilising both qualitative and quantitative data; how I do this forms part of the story as it unfolds. Emergent design flexibility (Fig. 2.7) *"requires a high tolerance for ambiguity and uncertainty, as well as trust in what the inductive analysis will yield"* (Patton, 2015, p.49): an open-ended qualitative approach. My design strategy directs data collection and fieldwork strategies: a *'dynamic systems perspective'* (Fig. 2.7), primarily pays attention to process and ongoing change, of how myself as a participant/ researcher and the story is evolving in this process; my reflective journals, drawings, and models (physical/ digital) helping catalogue fieldwork; creative synthesis comes through reflexivity to antagonise and present the data (Fig. 2.7).

From the outset autoethnography guides this thesis, but it will be orientated by other fields like design science; they both share a focus on studying artefacts, but design science uses language that I better relate to. I want to ensure *'what I say and what I do'* are congruent, so as not to face the wrath of Tolich (2010) like autoethnographic exemplars have, to do this I need to nuance the *'tools'* I have with others that I am acquiring as we progress.

I value the freedom autoethnography offers methodologically, but at this stage it feels like it is sitting within a cloud as the narrative is yet to be formed; it feels like being in a *'pre-science'* state (Chalmers, 2013, p.103) in the Kuhnian sense, the story and data currently float in the ether (Fig. 2.8). Feyerabend (2010, p.7) reminds us all methods bring limitations, autoethnography is criticised for being *'non-analytic, no theory, no concepts, not scientific'* (Denzin, 2014, p.69); fusing art and science can showcase congruence between what I say and do, to showcase the science of autoethnography.
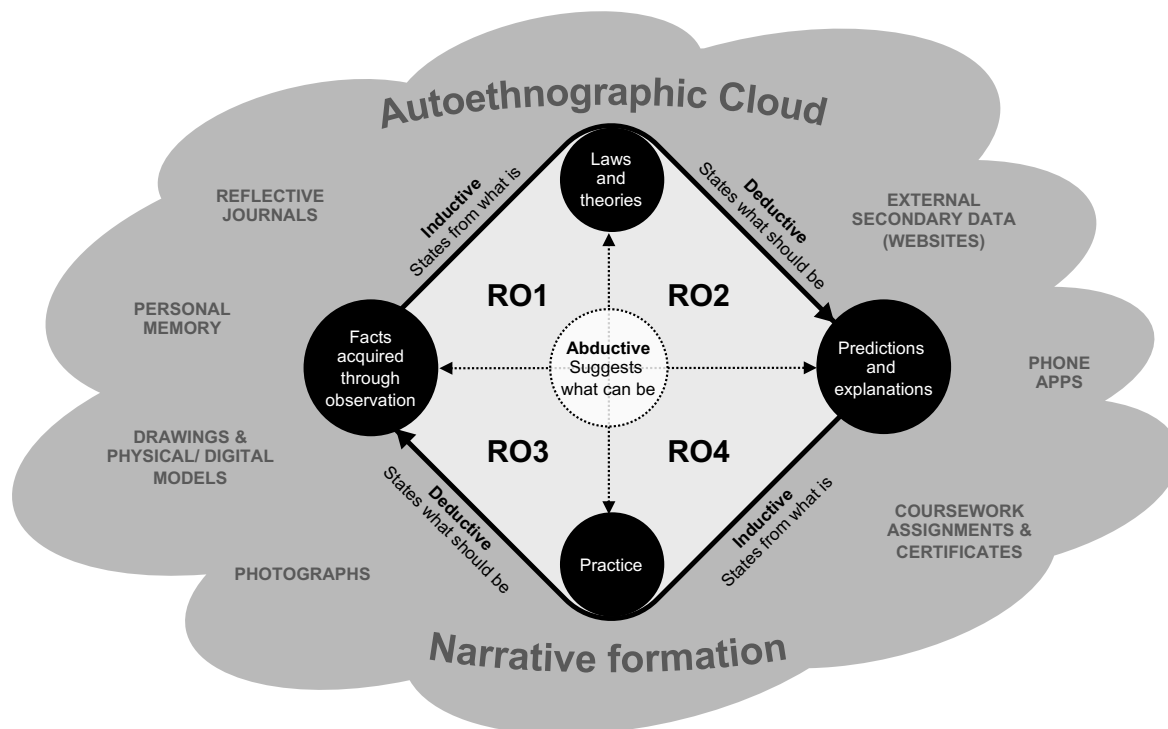
Figure 2.8 – Fusing scientific methods with autoethnography to inform the narrative.
(By author, informed by Dresch et al 2015, p.62; Chalmers, 2013, p.50).

Fig. 2.8 fuses together my thinking at this stage, importantly it outlines abductive reasoning; a scientific method to support inductive and deductive logic. Abductively I am drawing on my imagination, intuition, and experience to initially navigate the way forward. I am thinking about my research objectives (RO's), they need to actively help me direct the story. I will inductively explore my experience through empirical observation, but the reality is I use inductive and deductive logic interchangeably, taking abductive, intuitive leaps to do so; to antagonise the gap between theory and practice.

Creswell and Poth (2018, p.65) showcase five qualitative approaches to inquiry, which are included with design science research (DSR) in Fig. 2.9. DSR helps inform my use of both narrative research and ethnography to focus on delivering insights. DSR also contributes to *'conversations'* on design/ mid-range theories, it helps me to iterate and evaluate artefacts, to abductively suggest *'how things should be'* (Fig. 2.8, p.32) and not necessarily *'how things are and how they behave'*; which autoethnography does focusing on *'self'*. DSR can focus on *'designing and recommending'* (Fig. 2.9), but there is no mandatory requirement to implement or test any artefacts (Dresch et al, 2015, p.95-96).

In Fig. 2.3 (p.18) I identified *'Autobiographical Ethnography'* as a potential *'label'* in how I orientate my use of autoethnography, a *'label'* to help me explore the culture (ethno) within built environment education through my *'lived experiences'* (Fig. 2.9). Inclusion of DSR brings a different dimension to how I nuance both narrative and ethnographic research, it looks at the research problem differently. DSR takes a pragmatic approach in its exploration of solutions, it brings a different language to help realise RO4 (p.11) and how my experience is explored. The conversation to evolve through chapters 3 and 4, is to critique *'artefacts'* drawn from my *'lived experiences'* of built environment education; doing so is to develop a framework to aid the conversation in chapters 5 and 6, to systematise and pragmatically support and focus the narrative within both chapters.
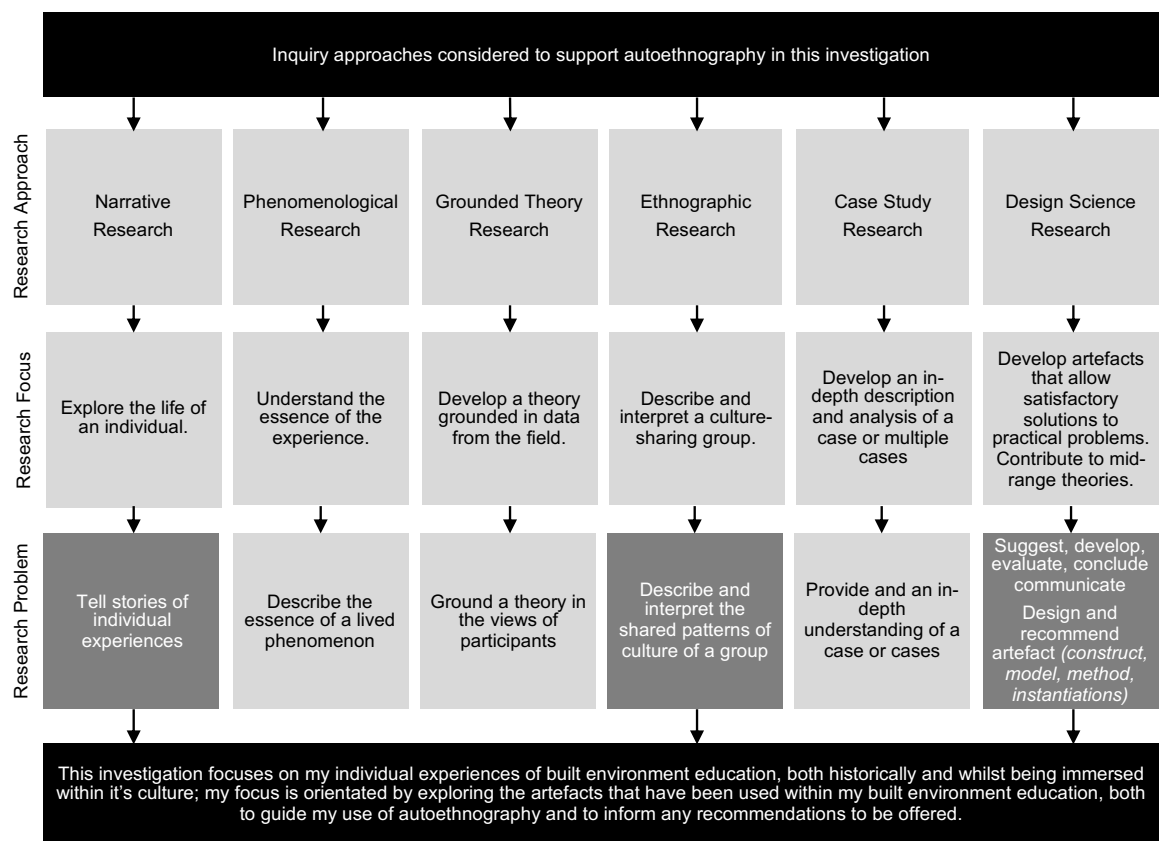
Figure 2.9 – Inquiry approaches and how they support autoethnography.
(By author, adapted from Creswell and Poth, 2018, p.67).

Chapter 3 will play a central role strategically, connecting a number of research strategies outlined in Fig. 2.7 (p.31). Johannesson and Perjons (2014, p.52) in discussing *'role-play simulation'* highlight *"how empirical research strategies investigate naturally occurring or contrived reality, a simulation studies an imitation of reality"*; in my case an *'artificial simulation'* offering insight into the culture, working patterns and social behaviours of staff and students, through my own *'lived experience'* (Creswell and Poth 2018, p.91; Wolcott, 2008, p.253). Exploratory by nature chapter 3 will postulate about theory, whilst seeking out patterns within both uncollated and unintended fieldwork (Fetterman, 2010, p.8); it will use field text not originally thought of as *'data'*, helping me *'probe and listen to my own experience'* (Clandinin and Connelly, 2000, p.109). From chapter 3 there is a conscious shift in emphasis from ethnographic focus to a narrative research approach, more so in chapters 5 and 6 as this research becomes more focused. Clandinin and Connelly (2000, p.50) offer four directions that help focus narrative inquiry:

> *"Inward and outward, backward and forward. By inward, we mean toward the internal conditions, such as feelings, hopes, aesthetic reactions, and moral dispositions. By outward, we mean toward the existential conditions, that is the environment. By backward and forward, we refer to temporality – past, present, and future."*

By paying attention to temporality within the process of writing I can re-live my experience by drawing on the data and artefacts of built environment education; creatively *'re-connect-the-dots'* of my *'past, present and future'* through the voice of different characters. Clandinin and Connelly (2000, p.50) refer to Dewey and frame he provides for thinking of experience *"beyond the black box"*, it is our imaginations that can take us beyond what our experience can be reduced to. Through personal journals, coursework assignments and other textual artefacts, and personal memory data the narrative comes alive experientially; all crafted in a way that takes you on a journey into your own experience.

Chapter 4, drawing from chapter 3, explores literature to help better structure the narrative in chapters 5 and 6, going deeper into my *'lived experience'* over different time periods; it is a *'label'* more than *'autobiographical ethnography'* that reflects my use of autoethnography. Phenomenology, grounded theory, and case study research were considered, but only to inform my eventual orientation of autoethnography (Fig. 2.9, p.33). Having explored a range of different approaches, it is Creswell and Poth (2018, p.123) who highlight that we must ask ourselves; *'who's is the audience we are catering for?'*, *'what experience do we have?'*, *'what is the scholarly literature saying to us?'*; most importantly *'what are we comfortable with personally?'*. I value what autoethnography offers: a *'blank canvas'* to paint a picture of my *'lived experience'*; one delivered creatively and imaginatively with verisimilitude through a *'cubist'* lens, lending itself to be re-told and reinterpreted through the reader's eyes and reflective thoughts.

Autoethnography offers the opportunity to explore many questions, methodologically it is *'researcher-friendly'* because it offers me access to a significant amount of primary data, *'myself'* (Chang, 2008, p.52), it may sound easy, but it comes with significant responsibility as I proceed. In addition to this a range of different sources of quantitative and qualitative data sources can be used, so before going into them it has been necessary to develop a strategy to help support the data; that lets autoethnography guide me through it. Simulating my *'lived experience'* in chapter 3 through *'role-playing'* characters offers this research freedom to grow; the beginning of an adaptive developmental evaluation approach (Patton, 2015, p.60).

As set out in the data collection and fieldwork strategies within Fig. 2.7 (p.31), chapter 3 will use both qualitative and quantitative data causally to create the *'idea of'* something which emerges from the unfolding story itself (Price and Jhangiani, 2018). Through a combination of both we have the *'richness and colour of qualitative data'*, fused with a *'structure that quantitative data provides'* (Wellington, 2015, p.29). Wellington (2015, p.29) offers a rather crude analogy that resonates:

> *"If I read a report on a soccer (or cricket, netball or hockey) match, I seek both qualitative (descriptive) and quantitative (numerical) information. The reporter can wax lyrical about what a great game it was, who played well, how the crowd reacted, who eventually triumphed and whether the referee survived the ordeal. But I also require the following data: Liverpool 2 (Scorers: Suarez, 20 mins; Gerard, 89 mins). Arsenal 1 (Scorer: Walcott, 46mins; sent off: Ramsey, 32 mins)."*

Exploring the correlations in my *'lived experience'* means both qualitative and quantitative data are nuanced into the story; autoethnography fusing art and science through narrative, to help focus the review of literature in chapter 4.

Chapter 3 will inductively bring *'experiences, feelings, stories and 'happenings'* together (Ellis, Adams and Bochner, 2011); through personal memory, self-reflection/ observation and artefacts drawn from my *'lived experience'*. However, Usher et al (1997, p.42) suggest experiential validation is flawed pedagogically, in thinking about my data and my *'lived experiences'* from multiple perspectives, as an educator I am drawn to pedagogy; to further my knowledge in this area. Sharples (2019) suggests *"pedagogy is something teachers do, but don't generally talk about"*, in my experience I believe this to be the case; both as an educator and a student. Sharples (2019) provides a range of innovative pedagogies to explore which can inform my use of autoethnography, that theoretically informed praxis aids data collection and analysis; data which is drawn from personal memory, self-observation, and self-reflection, or collected externally in different ways and nuanced into the narrative to show my *'learning gain'* (Chang, 2008).

Chapter's 3 to 6 use external data from government, regulatory bodies, professional bodies, and academic institutions; qualification descriptors from the QAA for example. This external data provides a foundation to support my personal memory data (Fig. 2.10), recorded in my personal journals. Personal data is also collected through *'lifelogging'* within phone apps (Sharples, 2019, p.55), where my location, health, diet, sleep, and exercise are recorded; with photographs and other graphical inclusions chronicling my life over a 2-year period. Through both systematic self-observation/ reflective practices and recording observations in person journals with external data, exploration of themes began to develop and inform direction. Pedagogically multiple methods are brought together seamlessly, in a story that crosses environments, technologies and time to present itself within a *'cubist'* experience; one autoethnographic conversation.

DATA SOURCE		DATA COLLECTION AND RELATED EXERCISES
Personal Memory Data	• **Chronicling the past** – Personal reflections are recorded in journals and phone apps (also (self-observational/ reflective), but focused on recollections of personal experiences that come from analysing other data sources and observing my own learning and teaching practices. • **Inventorying Self** – Themes emerged from external data linked to my built environment education, proverbs have been used to capture my thinking at that time; personal rituals and celebrations are subtly used; my supervisors act as mentors to aid iteration of my writing; cultural artefacts and how I interact with them are a central *'conversation'*. • **Visualising Self** – Physical models, diagrams and hand drawings are collated in personal sketch books and software such as MS Word, PowerPoint and Excel, to evidence iteration of my thinking and writing to evaluate my progress.	
Self-Observational Data	• **Systematic Self-observation** – As discussed in personal data collection this is mainly recorded in personal journals and phone apps. Phone apps were used over a 2-year period monitoring location, health, sleep and exercise. At a programme level research was evaluated on annual basis, with iteration of this investigation saved and stored as I progressed within institutional systems. • **Interactive Self-Observation** – Through being interactive in research and work communities able to observe and record changes in my own behaviour.	
Self-Reflective Data	• **Field Journals** – Fieldwork primarily recorded in journals to record insights, this was a practice that developed implicitly as part of my working practice; became more focused with understanding and use of autoethnography. • **Discovering Self through Other Self-Narrators** – Developed my knowledge of autoethnography reading the work of others informs my own story.	
External Data	• **Textual and Other Artefacts** – Freely available public sources of information from government and regulatory bodies, professional bodies and institutional data bookmarked by web browsers. Physical copies of course data relating to my experiences of built environment education had been collected over 30 year period. Other artefacts relate to theoretical experiential models. • **Literature** – A focused review of literature is provided in chapter 4, but throughout all chapters literature is extensively used to underpin the narrative and my own voice in this investigation.	

Figure 2.10 – Data collection and related exercises. (By author, informed by Chang, 2008).

Textual and other artefacts (Fig. 2.10) inform chapter 3, it consolidates various kinds of data outlined in Fig. 2.10 into an autoethnographic narrative. From the inductive analysis of chapter 3, of listening to *'what the data is telling me'* (Srivastava and Hopwood, 2009), chapter 4 better focuses chapters 5 and 6. The work of other self-narrators (Fig. 2.10) offers ways to self-reflect on designing my own story, particularly in researching autoethnographic doctoral theses. Chapter 4 itself is particularly focused on exploring external literature (Fig. 2.10), to reduce over-relying on *'self'* as the primary data source, whilst still maintaining sufficient focus on *'self'* which autoethnography requires.

As a result of my education, I visualise *'self'* (Fig. 2.10, p.36) through physical models, or sketching out ideas to strategize my writing. Through personal journals, sketch books and digital media is a story of disciplined iteration; if something appears to work it can take on a written form, if I cannot write I will *'draw'* my way out of it. My interpretation of *'free drawing'* (Chang, 2008, p.84) is expressed in this thesis through many graphical representations, informed by exploiting the literature (Fig. 2.10, p.36) and crediting the sources that inspired them; it shows the interplay between *'self'* and a range of data from others, showcasing what autoethnography offers as we ourselves continue to evolve.

Central to this research is data that chronicles my life from child to now, from school reports through all my built environment education; a comprehensive collection of coursework assignments, course-related literature, certificates, and assessments of me by others. This collection of data covers a period of over 30 years, from trade apprenticeship, through to HNC/D, two degree experiences and includes my doctoral journey; only now being thought of as *'data'* and brought together with autoethnography. It profiles my development over time, offering an opportunity for me to reflexively explore through an educator lens to evaluate my experience; to realise my growth as a researcher. It is within this data that temporality is integral to connecting the personal and social dimension, as well placing my stories in the *'past, present and future'*; a *'metaphorical three-dimensional narrative inquiry space'* (Clandinin and Connelly, 2000, p.50). From this particular group of data is a need to tread carefully ethically, these are shared experiences with *'unknowing authors'* (Denzin, 2014, p.7); it brings up trust once more.

Ethics

As the researcher it is important to acknowledge narrative privilege, with it comes ethical considerations applicable to not only how data is collected but also how it is deconstructed and presented autoethnographically. My primary data has naturally been collected as part of my *'lived experience'*, not analysed beyond following instruction, reading feedback, and checking grades. Chapters 3 and 5 uses autoethnography to travel inductively through the data, chapter 3 particularly *'simulates'* events to explore literature in chapter 4. An output of chapter 4 is to provide a simple framework, one to depict the beginning, middle and end of a story; to explore *'self'* without influencing the content itself. It is through the inductive analysis of chapter 5, the interplay of different data types that the story unfolds; a *'real-time'* interaction between *'self'* and data to focus the story within chapter 6. The framework from chapter 4 will seek to explicate rigour in research without, crucially, influencing what the narrative should be; it is a means to help me *'listen to what the data is telling me'* once again (Srivastava and Hopwood, 2009); to abductively iterate and evaluate the data and *'self'* as the narrative itself forms (Fig. 2.8, p.32).

An assumption that could easily be made with autoethnography and a focus on *'self'* is that ethical issues do not apply to this research, this is incorrect (Chang, 2008, p.68); I am human, and my experiences of built environment education are shared with others. As an *'insider researcher'* I am immersed in a working environment that influences my research environment, but it is my orientation of autoethnography that keeps these apart; if asked about my research I will tell people about it, but mindful of how I discuss it.

This research has been conducted in an ethical manner, in accordance with Anglia Ruskin University's regulations and ethical approval process. However, I am guided more so by the British Educational Research Association (BERA) guidelines, prior, during and after the completion of this investigation; BERA explicitly refers to autoethnography. Fig. 2.11 summarises where this research addresses the BERA guidelines; the first point outlines my responsibility to participants including myself, that although students and colleagues may form part of the context, they themselves are not the focus of this research (Fig. 2.11). Although employed and working in higher education, I am an independent researcher self-funding this research (Fig. 2.11); despite a degree of freedom, it still comes with significant ethical responsibilities.

Ethical considerations	Prior to and beginning to conducting study	Data collection prior and during the study conducted	Analysis and reporting of data during this study conducted and when it's published
Responsibilities to participants	Participants are considered for active/ passive involvement; students and colleagues form part of the context of this investigation, but they themselves are not the focus of this research (BERA, 2018, p.6). The purpose of this investigation is to explore my professional practice and personal experiences of built environment education. Using autoethnography consideration has been given to how this investigation implicates myself and others, both prior and during it, in it's analysis and on publication; where deemed necessary consent from others will be sought prior to inclusion or publication (BERA, 2018, p.14). For transparency, unpublished data from my DProf is being re-used, which is anonymised and re-purposed through autoethnography (BERA, 2018, p.17).		
Responsibilities to sponsors, clients and stakeholders in research	At the time of receiving research proposal and ethical approval at institutional level, no sponsor funds or has commissioned this investigation (BERA, 2018, p.26). Being a self-funded investigation reduces the impact of conflict of interest, this is further reduced by having no direct association with professional bodies associated with built environment education during this investigation (BERA, 2018, p.18). As a participant (student/ educator/ professional) professional codes of conduct associated to such professional bodies would unnecessarily complicate my position as a *'client/ professional'*; **this investigation is educational research**.		
Responsibilities to community of educational researchers	As an independent researcher and a *'pracademic'* employed in higher education; this investigation is conducted within the context of built environment education but focused on my own individual experiences as student and educator independent of my employment. This investigation seeks to contribute to the community spirit of educational research, by providing sufficient critical analysis and constructive criticism that improves practice and contributes to knowledge; but not in a defamatory or unprofessional way (BERA, 2018, p.29). This investigation is conducted with respect; responsibility comes with mindfully considering my position and of others in it's story.		
Responsibilities for publication and dissemination	Autoethnography offers a significant amount of artistic license, however this investigation will not falsify, distort, supress, selectively report or sensationalise research (BERA, 2018, p.33). This investigation will creatively present research in ways which provides as true account possible ethically, whilst giving mindful consideration to areas which may impact myself and others in it's authorship (BERA, 2018, p.34). Consideration is also given to dissemination to a wider research community and stakeholders interested in this investigation; research impact requires ethical consideration at a design stage, which can hinder autoethnography during creative synthesis.		
Responsibilities for researchers' wellbeing and development	Safeguarding is shared with the awarding institution; we have a moral and ethical responsibility to safeguard ourselves and others. Proximity of conducting this research whilst operating in a work environment, brings significant ethical considerations in conducting of fieldwork (BERA, 2018, p.35). Data management and storage, data within institutional systems used to aid my personal development needs to managed in accordance to the UK Data Protection Act (1998) and GDPR, Freedom of Information requests under the Freedom of Information Act (2000) and management of data needs consideration on conclusion of this investigation (BERA, 2018, p.21).		

Ethical decision-making is an actively deliberative, ongoing, iterative process of assessing and reassessing the situation and as issues arise in this investigation (BERA, 2018, p.2)

Figure 2.11 – Risk-benefit analysis considered with BERA's Ethical Guidelines for Educational Research. (By author, Informed by BERA, 2018).

Wellington (2015, p.113) outlines five ways that educational research projects could be considered unethical; in its design and planning; in how methods are deployed; in analysis or manipulation of data; in the presenting or reporting of research; and within any findings, conclusions, and recommendations. Information collected prior to commencement benefits this research: deemed to be on research proposal and ethical approval at an institutional level, as a DProf candidate this is an important milestone ethically. Preliminary research can be conducted within my doctoral programme over a significant period from initial registration, before research proposal and ethical approval for the investigation itself is required; when I say autoethnography has been used from the outset of this investigation, I do not mean the beginning of my doctoral journey as they are 2-years apart.

By using autoethnography an important consideration is relational ethics; between myself as a researcher and those communities I have operated and do operate in (Adams, Holman-Jones, Ellis, 2015, p.56). Reference to BERA guidelines and the risk-benefit analysis (Fig. 2.11, p.38), outlines my personal responsibility to those communities. Where reference is made to other bodies or institutions, it is through publicly available information and referred to accordingly, any primary data collected that may impact others is anonymised to mitigate any risks. Where events have been empirically observed they are presented with *'respect for people, beneficence and justice'* (Adams, Holman-Jones, Ellis, 2015, p.56) to ensure their well-being and bring them no harm; that in critiquing my empirical observations the account is presented fairly and honestly.

With research strategies (Fig. 2.7, p.31) following more qualitative lines of inquiry, my ethical position has been a continual design conversation; both prior, during and afterwards. From doing preliminary research I have developed more awareness of ethics: Fig. 2.11 (p.38) demonstrates autoethnography is far from being a method that circumnavigates many ethical issues, it has helped me explore built environment education differently, safely, and considerately; it has elevated my thinking, my reflective and reflexive practices.

Fig. 2.11 (p.38) outlines how ethical decisions have influenced my research strategies at different stages, highlighting the value of the BERA guidelines and importance of doing the risk-benefit analysis. The simulation of my *'lived experience'* in chapter 3 re-purposes and anonymises data within an autoethnographic story over a 7-year period, initially the focus is to provide insight into the culture within built environment education; but the character's voices speak differently to how the events actually took place in reality. Progressively the focus moves more towards an interest in the design of artefacts and programmes, not on other people; this will become evident in reading chapters 3, 5 and 6, as the conversation becomes more focused.

Tolich (2010) suggests *"the word auto is a misnomer"* and that the *"self might be the focus of research, but the self is porous, leaking to the other without ethical consideration"*. This research makes reference to specific events within my experiences of built environment education, but not to any other individual other than myself. Subtle references are made to others, but conversations focus on the interaction between characters; multiple versions of *'self'* exploring different periods of my built environment education. Characters in chapters 3 and 6 bring different viewpoints to my *'lived experience'*, reflexively challenging my beliefs. De-construction and re-imagination of my experiences of built environment education has been a delicate process, my supervisors have been *'critical friends'*; mentoring me through periods of vulnerability, supporting me through critique of my work to protect myself and others (Fig. 2.10, p.36).

I have to consider my vulnerability in conducting this research, Tolich (2010) offers ten guidelines framed within *'consent, consultation and vulnerability'*; points within vulnerability refer to internal confidentiality, that as authors we should think of autoethnography as an *'inked tattoo'*. This has been central to me focusing on artefacts, bringing me back to design science research (DSR) briefly once more. My contribution to knowledge and practice likely sits in two domains, *'exaptation'* or *'improvement'*; authenticity is guided by my research objectives, my contribution in this research is merely viewed as a *'stepping stone'* to move forward with others.
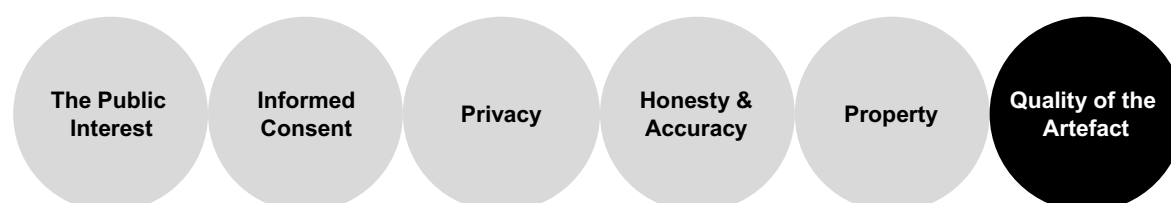
Figure 2.12 – Myers and Venable's (2014) proposed set of ethical principles for design science research in IS. (By author).

Myers and Venable (2014) suggest a proposed set of ethical principles for design science, the first five principles within Fig. 2.12 largely align with what BERA (2018) outline, reflected in the risk-benefit analysis (Fig. 2.11, p.38); generally applicable to all forms of research and good ethical practice. But what Myers and Venable (2014) give particular attention to is the *'quality of the artefact'*, that any associated risks in evaluating and testing any artefact should be rigorous, applicable to documentation also.

This is an important point as RO4 (p.11) focuses on recommendations to re-imagine built environment education, for which an instantiated artefact is a likely outcome; however, it is more important to note this comes because of the story to yet unfold, RO4 guides RO's 1-3 (p.11) to help systematise autoethnography in this research.

Myers and Venable's (2014) ethical principles for DSR (Fig. 2.12, p.40) offer useful points, in respect to *'the public interest'* stakeholders require consideration during and after this research. Despite a focus on *'self'* and my personal insights to achieve RO's 1-4, RO4 is likely to offer implementable artefacts within my recommendations in some way. Although my focus is not to test and observe any new artefacts in use, Fig. 2.13 outlines stakeholders that could be impacted both during and after this research in different ways; I will be critiquing different various artefacts throughout this investigation to explore areas for new artefacts, this brings a personal responsibility with developing any artefact, ideas, and associated theories.
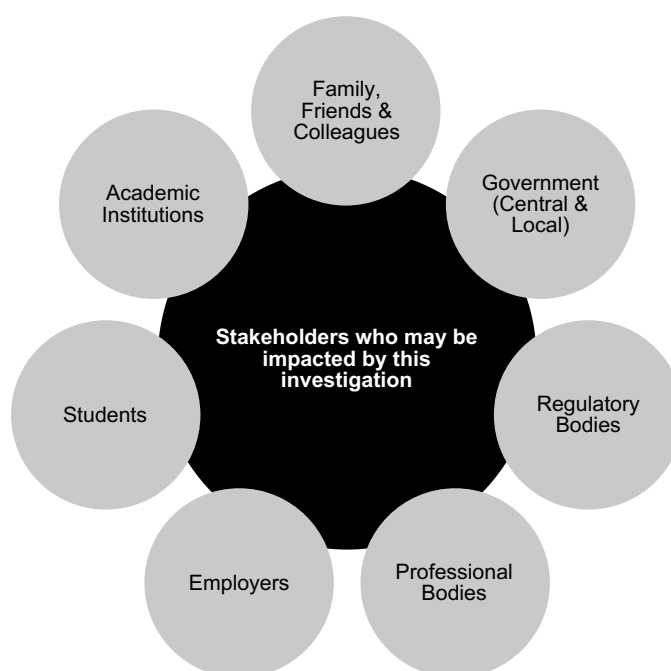
Figure 2.13 – Stakeholders who may be impacted by this research. (By author).

In respect to principle 4, *'honesty and accuracy'* (Fig. 2.12, p.40), literature is referred to in accordance with institutional regulations, any authors providing inspiration and ideas will be acknowledged in any graphical content used. Considering principle 5, *'property'* (Fig. 2.12, p.40), particularly intellectual property, it is important to credit and not plagiarise ideas; my claims to intellectual property in this research extends only to being credited by others, as I have in extending and interpreting the work of others.

Considering principle 6, *'quality of the artefact'* (Fig. 2.12, p.40), it is considered that any artefact(s) offered within my recommendations are low in risk. But from Fig. 2.13 is a reminder that any forthcoming artefact(s) should be inclusive to all stakeholders, those who influence built environment education now and in the future. My immediate focus within this research is to those that know me, those I shared experiences with in the past, present, and likely to in the future.

Evaluating and legitimising autoethnography

Autoethnography can receive criticism in respect to reliability, validity and generalisability, in respect to reliability and validity Wellington (2015, p.41) states *"the terms are often, especially in conversation, used to signal approval"*. Denzin (2014, p.70) suggests that autoethnography cannot be judged by traditional positivist criteria, this is because reliability, validity and generalisability *'have specific meaning within that discourse'*; in respect to autoethnography they can and do take on different meanings.

Ellis et al (2011) state *"questions of reliability refer to the narrator's credibility"*, bringing a degree of *"literary license"*; but there is a need to balance *'science fiction and science fact'*, *"truth"* can change in the writing or representation of experience. Ellis et al (2011) highlight *"memory can be fallible"*, that any recalled experiences are only an impression of a lived reality; context, meaning and utility can alter as stories are told and re-told differently. I accept my contribution to knowledge is contested because it is situated in my experience (Adams, Holman-Jones, Ellis, 2015, p.97). However, in the context of my DProf there is little value in over-exaggerating my experiences of built environment education, it would suggest a single version of the truth. It may undermine the value of my insights, their *'meaning'* and *'utility'* would limit my contribution knowledge and practice.

Reliability and validity are closely related issues for autoethnographers, *'validity means seeking verisimilitude; that described experiences are lifelike, believable, and truthfully represented and that it invokes such feelings in an audience'* (Ellis et al, 2011). Holman-Jones, Adams and Ellis (2016, p.33) suggest this can be illustrated in fully articulating *"the complex research and decision-making processes researchers engage in to conduct their work"*; evident in this chapter. Denzin (2014, p.70) states *"generalisability is determined by how a reader responds to a representation"*: they *"determine if a story speaks to them about their experience"* (Ellis et al, 2011).

Etherington (2004, p.147) suggests autoethnography can *"trouble familiar rules for judging the quality of research"* and that there is a need to find *'deliberately transgressive'* ways to judge research (Richardson, 2000). Rodriguez et al (2017, p.61) question the value of triangulation to autoethnography. Crystallization is a postmodern alternative, Richardson (2000; 2018) states *"crystallization provides us a deepened, complex, thoroughly partial understanding of the topic. Paradoxically we know more and doubt what we know. Ingeniously, we know there is always more to know"*. Richardson also states, *"crystallization without losing its structure, deconstructs the traditional idea of validity"*, as a pragmatist I see merits in both triangulation and crystallization, which I will re-visit as we progress into chapter 3.

Anderson and Glass-Coffin (2016, p.65) discuss pursuing methodological clarity, sparking my interest in criteria to validate autoethnography. However, Bochner (2000, p.267) suggests it can preoccupy us in the pursuit to demonstrate rigour, that in worrying about how we are judged we can neglect imagination. *"Criteria pose as something beyond culture, beyond ourselves and our own conventions, beyond choice and interpretation when, of course they are not"* (Bochner, 2000, p.267). I could just return to Hayano (1979, p.99); use my membership as an *"insider"*, one with *'multiversal perspectives'* operating within built environment education.

However, brief exploration of the topic of criteria offers insight into the thinking of others, but not to the point where it *'limits my possibilities and stifles my creative energy'* (Bochner, 2000, p.267). Like Hamood (2016, p.47), my interest in criteria to validate autoethnography is more with *"how such tools, mechanisms and processes are devised"*: especially when *"criteria are not found; they are made"* Bochner (2000, p.269) reminds us. Anderson and Glass-Coffin (2016, p.79) suggest *'there has been considerable scholarly dialogue on criteria for judging the quality of autoethnographic writing, but not so much on the practicalities of conducting autoethnographic research itself'*. Coffey (2017) is an example where the practicalities take centre stage, and how relational ethics particularly can silence a method which some may find *"challenging, if not unpalatable"*.

Hughes and Pennington (2017) explore the *'practicalities'* of problematizing, legitimizing and synthesizing autoethnography. In respect to legitimation Hughes and Pennington (2017, p.89) offer three points:

- *Legitimizing (or legitimation) is important to autoethnography because of the high level of scrutiny applied to autoethnographic studies.*

- *Legitimizing is the process of making something "legitimate" or accepted, whereby many of the preferred practices of individuals with legitimate authority are adopted as cultural standards, benchmarks, and criteria for establishing criteria.*

- *Integral to the process of legitimizing is the understanding and implementation of rules and norms, and distinct approaches that comply with those rules and norms.*

Hughes and Pennington (2017, p.95) highlight one approach to legitimize autoethnography, by *'connecting approaches with key qualitative research requirements/ criteria'.* Three ways are explored which share credibility-seeking criteria of rigour and reflexivity:

- *Existing qualitative constructs (Guba and Lincoln, 1989; Starr, 2010).*

- *Traditional qualitative methodology (Anderson, 2006)*

- *Established professional association standards (Hughes et al, 2012).*

Anderson (2006) has been explored earlier in this chapter through analytic autoethnography (p.22), so I will explore the other two options. Hughes and Pennington (2017, p.95) expand upon Starr (2010; Guba and Lincoln, 1989) to outline criteria within Fig. 2.14. This approach challenges previous criteria for legitimizing autoethnography, namely Ellis and Bochner (2000), which Starr (2010, p.5) highlights does not fully address authenticity. Derived through its iterations of authors to Hughes and Pennington (2017), this criterion closely aligns with constructivist inquiry; knowledge socially constructed. Hughes and Pennington (2017, p.95) comprehensively provide tabulated explanation and examples, with useful points to consider, particularly around ontological authenticity which includes facilitating change in pedagogical practices and policies; however, in comparison to the approach Anderson (2006) offers, analytic autoethnography would appear to offer a simpler path to conduct this investigation.

Guba and Lincoln (1989) Starr (2010) criteria		Hughes, Pennington and Makris (2017; AERA, 2006) criteria
	• Fairness	• Problem formulation
	• Ontological authenticity	• Design and logic of the study
	• Catalytic authenticity	• Sources of evidence
	• Educative authenticity	• Measurement and classification
	• Tactical authenticity	• Analysis and Interpretation
	• Methodological rigor	• Generalization
	• Aesthetic rigor	• Ethics in reporting
		• Title, abstract, and headings

Figure 2.14 – Comparing evaluation criteria to legitimise autoethnography (by author, informed by Hughes Pennington and Makris, 2017).

The third approach to legitimizing autoethnography Hughes and Pennington (2017, p.104) highlight links to AERA standards (Fig. 2.14), possible synergies to explore with the BERA guidelines; however, first thoughts is that they do offer themselves as a useful evaluative tool for benchmarking quality. This approach of aligning autoethnography with recognised standards does appear to have a had an impact on evaluation of the method.

Hughes and Pennington (2017) and Hughes et al (2012) outline five key focus points, key indicators linked to the standards and a grading matrix to evaluate the merits of any research; the sliding scale of evaluating research goes from publishable, publishable with minor revisions, to major revisions and re-write/re-conceptualise. This feels like common sense; however, it is the principle that resonates, not Hughes et al (2012) criteria itself. It serves as a good precedent to map this research to the QAA (2014) criteria at doctoral level, a possible means to assess the quality of this thesis. If considered positivist criteria then Denzin (2014, p.70) could be challenged and autoethnography can be judged by it, which is something I want to explore further.

The QAA qualification descriptor for doctoral degrees sits within annexe 2 (QAA, 2014, p.10), it refers to the Quality Code and explains the outcomes and attributes expected of learning at doctoral level; the expectations for holders of these:

> *"Will be able to **conceptualise, design and implement projects for the generation of significant new knowledge and/or understanding**. Holders of doctoral degrees will have the qualities needed for employment that require both the ability to make informed judgements on complex issues in specialist fields and **an innovative approach** to tackling and solving problems...**Professional doctorates aim to develop an individual's professional practice** and to support them in producing a contribution to (professional) knowledge."*

As a DProf candidate the opportunity to *'conceptualise, design and implement'* this project autoethnographically can showcase my *'individual professional practice'*; a framework for a conversation to determine its quality, to arrive at an outcome where I demonstrate the attributes required at doctoral level. Fig. 2.15 represents the tabulated information from the QAA (2014, p.10) L8 descriptor, the four points outlined in red interest me. This QAA criteria serves as an example of an artefact, my built environment education offers many at different levels; Fig. 2.15 offers the means to evaluate this research, it feels like the common sense approach compared to the other criteria.

Doctoral degrees are awarded to students who have demonstrated:	Typically, holders of the qualification will be able to:	Holders will have: who have demonstrated:
• The creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication. • A systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice. • The general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in light of unforeseen problems. • A detailed understanding of applicable techniques for research and advanced academic enquiry.	• Make informed judgements on complex issues in specialist fields, often in the absence of complete data, and be able to communicate their ideas and conclusions clearly and effectively to specialist and non-specialist audiences. • Continue to undertake pure and/or applied research and development at an advanced level, contributing substantially to the development of new techniques, ideas or approaches.	• The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent environments.

Figure 2.15 – Level 8 Qualification descriptor for doctoral degrees as an artefact of my built environment education (by author, re-presented from QAA, 2014, p.10).

Chapter reflections and insights

Being an *'insider researcher'* could be perceived as a limitation, or it could be considered a strength; a constraint to design with, which autoethnography explicitly showcases within the narrative itself. From a pragmatic viewpoint I can tackle any perceived limitations head-on within the narrative moving forward, using my imagination and intuition to interrogate theory and my experiences of built environment education in practice. Autoethnography comes with many *'labels'* but only two are considered; *'autobiographical ethnography'* and *'lived experience'*, both appropriate, but the latter lends itself better to this investigation.

With an emergent design strategy, this research is allowed to evolve and realise strategies for data collection, fieldwork, and analysis. Methodologically this investigation takes a transdisciplinary approach, design science helps to orientate my use of autoethnography. It could be suggested this research offers some originality methodologically, but I do not want to get ahead of myself; I aim to use autoethnography in a different way, in turn allowing built environment education to be explored differently. From chapter 3 I will progressively take a narrative approach, to showcase the flexibility autoethnography offers in delivering my personal insights; it will use characters to better contextualise this research, from which we can then begin to better *'connect-the-dots'*.

Methods outlined within this chapter can now begin to showcase what autoethnography can offer; a *'means'* to creatively tell the story of my *'lived experience'* of built environment education. Ethical considerations have been given particular attention, along with outlining ways to evaluate and legitimise autoethnography itself; the QAA (2014) criteria, an artefact of my built environment education is something to explore. This chapter connects the autoethnographic stories to unfold in chapters 3, 5 and 6; it provides the foundation to safely, yet imaginatively allow the characters to tell their story; to unlock insights and possibly offer pragmatic recommendations.

Moving through the next chapters 3, 4, 5 and 6 perform different functions; chapter 3 inductively sets the scene, providing a thematic framework to inform the review of literature in chapter 4. Chapter 5 inductively explores different periods of my built environment education, through me talking directly to you; chapter 6 will use multiple characters to draw various threads of chapters 3 and 5 together. This chapter articulates how this investigation goes about its business; it offers flexibility in design, with the aim of showcasing the skill an individual has developed in re-imagining their *'toolbox'*.

Chapter 3 – Contextualising this Investigation

This chapter simulates a relatively short 7-year period, a period of significant personal growth as I transition between graduate and educator; it creatively uses autoethnography to re-tell experiences through three characters; the pracademic, academic and student (Fig. 1.3, p.13). From a belief thatbuilt environment education needs to be re-imagined comes a better understanding of issues in practice, reflexively challenged through my voice from different perspectives; the goal is establishing a clearer focus beyond this chapter.

This chapter slowly builds, requiring patience as the story unfolds: a conversation develops, from my early thoughts as an academic, deviating into different fields such as cybernetics; it provides analysis of comparable built environment courses, exploring their modular and disciplinary impact; to seeking ways to synergise and systematise professional body criteria and institutional strategy into the learning experience.

This chapter provides an important stepping stone, by focusing the review of literature in chapter 4 and a foundation for chapters 5 and 6. This chapter sets the tone, exploratory research evolving through the unfolding story of my own experiences; it is an open-ended chapter packed with insights, it addresses more the *'why'* of my research question as I begin to explore *'how'* more so going into chapter 4.

Where to begin?

"Ok, how shall we start this conversation?" the pracademic thinks to himself. Adams, Jones and Ellis (2015, p.47) suggest *'starting where you are and finding yourself in the story'*, referring to epiphanies particularly, to help begin autoethnographic projects. The student shrugs *"I can't think of any 'epiphanies' at the moment"*. The academic suggests to the pracademic telling us; *"why do you want to re-imagine built environment education?".* The pracademic shrugs, *"I'm not sure why exactly yet; it's just really come as a result of my own experiences and working in academia".* *"I know how you feel. I've got this annoying 'itch', this sense we can do it better",* replies the academic. The academic refers to Johannesson and Perjons (2014, p.7) who state:

> *"The starting point for a design researcher is that something is not quite right with the world, and it has to be changed."*

"This is where I'm at, something doesn't seem right, I've spent a couple of years now in academia and this annoying 'itch' won't go away", adds the academic. The pracademic turns to the student, *"let's help him scratch his 'itch' and see where it takes us, feel free to chip in at any time".* *"Cool with me",* replies the student. The pracademic asks the academic to talk about coming into academia and we'll go from there.

Early thoughts from a new academic

I came into academia at a time of change for my new institution, a transformation project to overhaul operations focused particularly on teaching and learning; lots to do it appeared to prepare for a new academic year, so I was well placed to approach it with fresh eyes. I've experienced these kinds of projects outside of academia, but have to say, *'what a mess!'*. *"Why do you say that?"*, asks the pracademic. Initially, I had space to digest what was going on, my teaching was relatively light. A central part of this project was consultations with both staff and students, to transform the teaching and learning experience. Yet with only months before launching our new programmes, the documentation was a mess, modules duplicated each other, staff seemed fed up with it all. Foreseeing problems I naively highlighted them, but as somebody new to the field you can imagine it was not well received: welcome to academia.

Harland (2012, p.88) highlights induction for new academics can be problematic, a *'sink or swim'* situation. Initially, I felt a bit lost, but being left to my own devices I managed to stay afloat. The pracademic reflects, *"I can remember reading Harland's book myself, he offers great 'thoughts for reflection' highlighting particularly how new academics tend to focus on their subjects and departments"*. Harland (2012, p.91) says;

> "*Getting to know what is happening across an institution or sector can change thinking and open up a vast range of possibilities for academic work"*.

Thanks Tony Harland. Harland (2012, p. 87) also provided six further points, three of which have proved to be sound advice since coming into academia:

- *Try not to volunteer for too much too soon. Your working week will fill up quickly regardless. Getting rid of responsibilities later is far harder than taking them on.*

- *Be proactive as an apprentice academic and don't wait for others to 'invite you in'*

- *Make new contacts in your university outside your department and discipline because the internal and often closed world of the department does not reflect the possibilities for academic work.*

So, from what I consider a relatively poor induction process, I took on board these points and went *'swimming'*. This was a really creative period, curriculum design interested me, I immersed myself in it and this project.

The student chips in *"sounds like induction or the transition to higher education is similar for both new students and staff".* The pracademic not wanting to break the academic's stride suggests *"perhaps we can come back to this, I think you're probably right".* Intrigued the pracademic asks the academic to carry on talking about this *'creative period'; "why was this period particularly creative?".*

I don't know why but I was drawn to this transformation project, intuition I guess, but my *'itch'* began here. I was seeking out a *'hook'*, something simple to help visualise information and make it useful. Probably sounds boring and mundane, but I'm really drawn to patterns in data, not sure why. The student again chips in *"I began to find myself being interested in this at Uni"*. The pracademic asks the student to elaborate *"why does better visualising information interest you?"*.

The student takes up the conversation: during my degree I became interested in the RIBA Plan of Work, we studied it in-depth within a live project with a client. I don't like modules, actually I hate them, but this one was different. I don't know how but it changed how I thought, or how I approached things. *"An epiphany?"* the academic suggests. I guess so, but I couldn't tell you much more than that though. *"I've used the RIBA Plan of Work in aspects of my teaching"* says the academic. *"Let's keep this in mind, it's interesting to hear you talk about modules also, but I want to come back to the academic for now"*, suggests the pracademic thanking the student.

The academic continues, taking Harland's advice I explored outside my department and was proactive in getting to know people across the institution. I trawled through vast amounts of institutional data related to the transformation project, vision statements, strategic aims and objectives; all generic glossy stuff and representative of many institutions in the sector it appears, do they all hire the same PR company?

Through conversations with staff and reviewing a range of information, it quickly became apparent there was a gap between institutional vision and departmental interpretation, no clear guidance, or mechanisms how to implement. Despite staff and student consultations, it appeared a largely top-down process had occurred. The leadership and organisation seemed a bit disjointed, leading to a re-packaged regurgitation of the current course, not a transformation of the learning experience itself in reality. But I found a *'hook'*, a nugget, four themes (Fig. 3.1) from a briefing document modified to provide a generic representation in this instance.
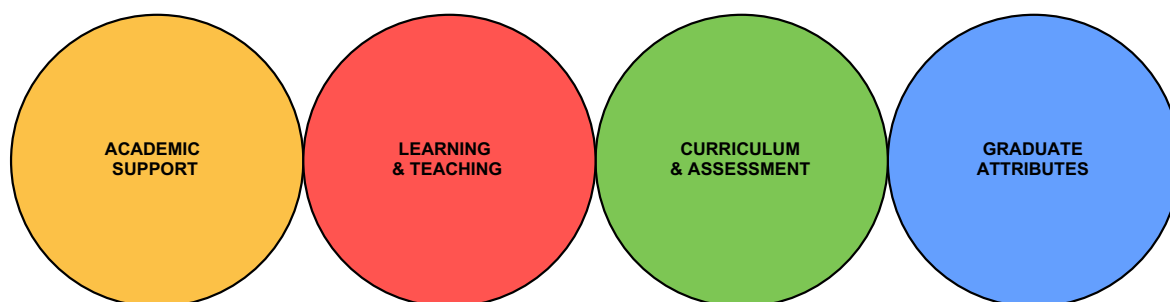
Figure 3.1 – Four generic themes derived from exploring institutional data (By author).

"Why do you consider these themes a 'nugget'?", asks the pracademic. I wanted something definitive, representative of the transformation project itself; a design generator to inform my thinking. Fig. 3.1 (p.49) is a generic representation, institutional wording removed, but *'Graduate Attributes'* stuck out as a significant influencing factor. It's a term that appears to be a generically aspirational statement virtually every university in the UK uses but is an output influenced by the other themes. *"Ok but why is considering 'Graduate Attributes' as an output that important?"* asks the pracademic. It was just an idea that a well-designed learning experience should provide artefacts *(graduates)* representative of the institutional strategy itself, which should in *'theory'* offer greater certainty for student success to institutions, whilst demonstrating how good a strategy actually is. The pracademic ponders for a moment, *"This sounds interesting, but I think in reality too many institutions just do the exercise, forget about the strategies, or change them without testing them to know if they actually work"*.

The student is curious *"I can't recall any Graduate Attributes while I was studying, but I can remember looking for an ethos or mantra myself"*. *"I can relate to this"*, says the academic. The student continues, *"I wanted something I could reflect on to guide me whilst studying, I like to think of it as an ideal to work towards"*. The academic pulls out a black journal, *"this is one of seven I have, each numbered chronologically, full of notes of observations, reflections, sketches, doodles and ideas. The first journal was presented to me when I started my degree; the practice has stayed with me ever since. Inside every front cover is a quote from John Ruskin;*

> *"In order that people may be happy in their work, these 3 things are needed*
>
> 1. *They must be fit for it*
> 2. *They must not do too much of it*
> 3. *They must have a sense of success in it."*

The pracademic asks, *"why this quote?"*. The academic replies, *"The quote reflected how I felt when studying. I read about Ruskin in 'Selected Writings' (Birch, 2004), Bragg (2011) and other sources such as Infed (2019). Ruskin himself is difficult to read, but he's honest, has strong principles and is holistic in mindset. He has his flaws, but his views on education resonated with me whilst studying"*. "*I have a quote by Buckminster Fuller in all four of my journals, it reflects my mindset"*, says the student.

> *"I refuse to treat diverse subjects as specialized areas of investigation, because it inhibits my ability to think intuitively, independently, and comprehensively"*

"It's amazing how a simple gift can have an impact", says the pracademic, who suggests exploring some of the themes within Fig. 3.1 (p.49) but asks the academic to talk a little more about this *'really creative period'* first.
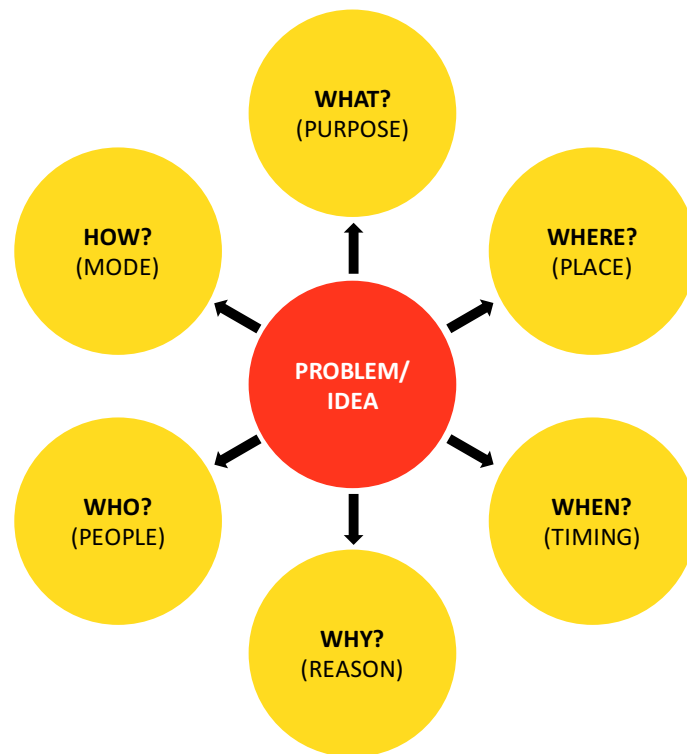
*Figure 3.2 – Diagnosing a problem or idea to inform Strategic Briefs with
the 'Five Ws & one H' questions. (Fletcher and Satchwell, 2015, p.84).*

The academic continues, I compiled a sketchbook of ideas, using 5W and 1H questions (Fig. 3.2). Sinclair (2013), and Fletcher and Satchwell (2015) informed my thinking, both focus on the RIBA Plan of Work. Fletcher and Satchwell (2015, p.84) use 5W & 1H questions with other words to direct questions (Fig. 3.2). The pracademic says, *"Rudyard Kipling's 'Honest Serving-men', helpful to begin exploring a potential problem".*

Trafford and Leshem (2008, p.90) I've found useful also, helpful to draw synergies across academic and industry-based literature. Fig. 3.2 informed my thinking for a range of ideas, not necessarily focused on the problem. ***What*** and ***Why*** are important, but I knew these to some extent so I focused on ***How (mode)***; it drew me into how we assess people in built environment education, and the process underpinning learning experiences.

Progressively *'doing-your-doctorate'* books have helped me: Walshaw (2012) generally helpful; Smith (2009) for maintaining a reflexive practitioner DProf focus; Fulton et al (2013) brought awareness of autoethnography; Trafford and Leshem (2008) was a pre-enrolment purchase. Trafford and Leshem (2008, p.54) suggest creating a visual strategy: '*an architecture – a blueprint of the possible structure and shape of your thesis'*, as a visual learner this offered me something to play around with. Trafford and Leshem (2008, p.11-32) talk about *'the end is where we start from'*, a conversation around *'quadrants'* caught my attention; it brought out synergies between *'graduate attributes'* and *'demonstrating doctorateness'*, those *'aspirational artefacts of output'*.

I became immersed in researching about process design, how models manifest themselves in reality; the simplest and most useful initially was by the Design Council. The *'Double Diamond'* model (Fig. 3.3); *'Discover, Define, Develop, Deliver'* informed my thinking around the four themes in Fig. 3.1 (p.49). It could be viewed as a linear model, but it is an iterative model that guides you backwards and forwards through a project or situation, helping work towards providing a solution.

Discover insight into the problem **Define** the area to focus upon **Develop** potential solutions **Deliver** solutions that work

Problem Problem Definition Design Brief Solution
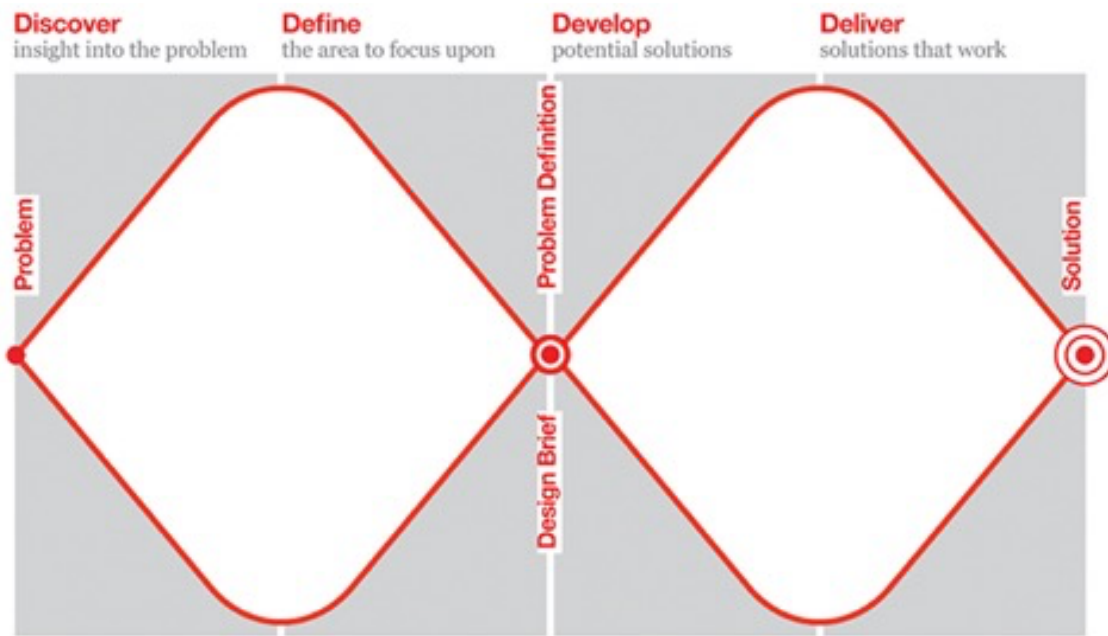
Figure 3.3 – Double Diamond of the Design Process. (Design Council, 2017).

I focused initially on project themes in Fig. 3.1 (p.49) and *'Double Diamond'* process (Fig. 3.3); drawing and working up conceptual ideas helps me visualise process and theorise about things, I'm probably guilty of over-theorising at times. The student says *"I'm like this, it was whilst doing the module focused on the RIBA Plan of Works, I noticed it more. I can visualise the process of things better, more intuitively, I feel more aware of my thinking, but I don't know why; it helped me do my dissertation. You (academic) may help me scratch my own 'itch', so I'm fascinated"*.

The academic continues, *'the end is where we start from'* is an under-appreciated yet crucial part of learning programmes, the *'output'* can be overlooked; assessment an afterthought, constructive alignment an implicit process, with too much focus on learning outcomes at the expense of the actual assessment itself. At times there appears to be no explicit link, which confuses students; it did me. The pracademic ponders for a moment; *"interesting, it makes me think of the difference between predicted and actual behaviour of buildings; we forget how users impact them"*. *"A key 'user' is normally missing in an assessment 'conversation': us"* replies the student. *"For me it's what makes autoethnography useful, it's unending"* adds the pracademic.

I'm going to come back to Tony Harland, it was reading his book that brought a greater awareness of how marketisation of education hinders the learning itself. Harland (2012, p.35) highlights how a greater emphasis on producing lectures has increased expectations for both students and staff, students want more *'boom-for-their-buck'*, to the detriment of the staff experience. *"Not wanting to sound disrespectful, but I actually found many lectures unhelpful, 'dull as' and sometimes timetabled poorly with submission of work itself; irrelevant to how I was going to be assessed"* says the student. The pracademic thanks the student, *"you're not being disrespectful at all, these are all useful insights"*. The academic nods agreeingly; I was going to touch on some of these because I'm always conscious of this as a member of staff.

Harland (2012, p.35) highlights timetabling and modularisation of higher education as issues, time slots organised and carefully planned; with initially light teaching commitments I observed many lectures across our course. *"Don't go into too much depth, just a snapshot"*, suggests the pracademic. Over a couple of years I've experienced long thin modules that run for an academic year, and modules that run for a typical semester *(12 weeks)*. *"I studied in 12-week modules over 2 semesters myself"*, says the student. *"I'm familiar with issues associated with them, the long and thin modules sound interesting"*, says the pracademic. It's worth noting the mix of part and full-time students, approximately 50%. *"I won't ask now, we'll get distracted, we can come back to this if necessary, let's focus on long thin modules first"* says the pracademic.

Long thin modules need careful planning, for example; students study all modules over the academic year, mainly 2 days a week; in 2hr slots in various room locations with minimal breaks in between, other than lunch; class sizes 150+. Time for formative assessment or tutoring was limited, it was difficult to gauge student progress. *'Bunching'* of submissions, assessment type and imbalance of workload across modules were issues, students became more aware of this; very passive and uninspiring experience for staff and students, too linear and pedestrian.

Staff teach on multiple days, possibly 4 a week; six weeks in many students were struggling, cognitively overloaded. Staff struggled to maintain momentum and cover content in 2hrs, some seemed to compete who could have the most slides, some text filled. *"I flipping hate that, what's the point? After 10mins I end up tuning out and scrolling through my phone"* says the student. *"Death by powerpoint"*, says the pracademic. I could say staff like the sound of their own voices, but I think it's a means to comfort themselves for fear of looking stupid in front of students.

I believe the issues I've just described came as a result of **'how'** the transformation project was conducted, despite staff and student consultations over 3 to 4 years; **'how'** did the *'user'* experience end up being so poor where it matters? There's dissonance between the designed experience and the actual experience, which affects the *'output'* or evaluation of both learner and the programme itself. Despite consultations I feel it was an experience that was significantly constrained before it was even allowed to develop; this is what I wanted to better understand.

Coming back to my *'really creative period'*, foreseeing issues I began exploring solutions, specifically *'user experience'*; it's a more appropriate term than student experience. I came across a company set up by a guy who was involved in the human-computer interfaces, in films such as Minority Report and Iron Man. I went to see their flagship system but became interested in how the thinking behind it transfers into the actual experience. How *'users'* interact with experiences I design has become a passion, actually an obsession. I read a blog entry by Davies (2016) who states;

> *"User experience describes how a person feels while interacting with a product or system. There are many aspects of a product or system that influence how a person feels when using it, including its usefulness, usability, and aesthetic appeal. These factors provoke different feelings over time that contribute to the overall experience".*

Davies (2016) provides four points *(below)* that resonate with me, informing my thinking with Fig. 3.1 (p.49); to assess experiences I provide and others interact with them.

- *Build a shared understanding*

- *Design with users in mind*

- *Validate early and often*

- *Test with customers*

Researching *'user experience'* further took me into games design, in doing so learning theories came into focus. Ahmad, Rahim and Arshad (2018) provide this classification of learning theories (Fig. 3.4), it led me towards experiential learning and humanism. *"I want to avoid learning theories for now, but you'll need to seek out better sources if exploring this further",* says the pracademic.
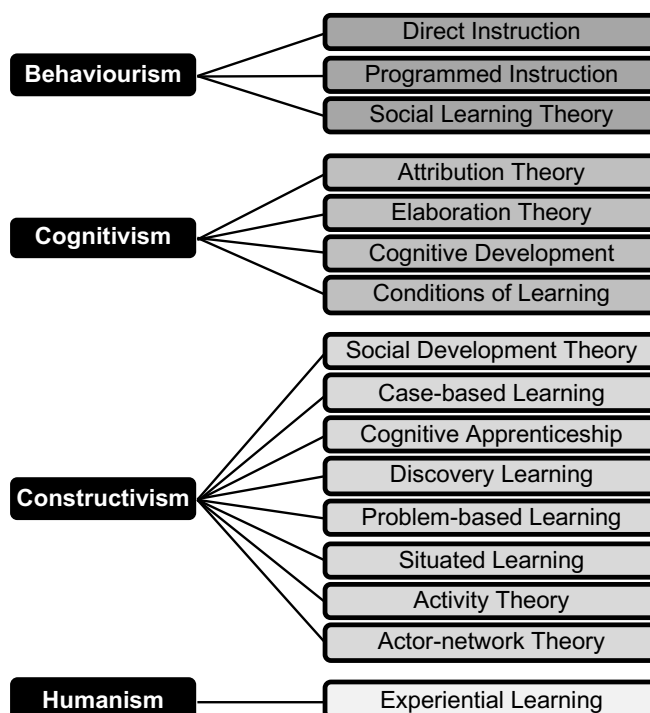
Figure 3.4 – Classification of Learning Theories. (By author informed from Ahmad, Rahim & Arshad, Researchgate, 2018).

"If you're interested in experiential learning, I'd recommend you start exploring the work of Schön, Kolb and Dewey with others, even back to Socrates. Anyway, let's not get distracted; why focus on the 'how/ mode'? (Fig. 3.2, p.51) *I want to be clear"*, asks the pracademic. Based on my observations it appeared the gap was between institutional vision and departmental interpretation, mechanisms to implement and monitor the project seemed to be the problem; the process, *'how'*, dissonance between the *'products' (staff/ students)* and their interaction with the *'system' (curriculum/ strategy).* All the information appeared to be there, but the biggest problem was between institution and department, they seemed like two different cultures. I'm glad I followed Harland's (2012, p.91) advice to appreciate this, replies the academic. *"How did you move forward with the conceptual models and ideas?"*, asks the pracademic. *"I explored industry methodologies, mainly the RIBA plan of works, analysing similar courses from other institutions, I also began to look at stakeholders influencing built environment education",* replies the academic.

The student tentatively asks, *"have you heard of Paul Pangaro by any chance?",* shaking their heads side-to-side both slowly replying, *"noooo". "After graduation, I began digesting what I had achieved but was left with more questions. I wanted to better understand my thinking, how my apparent self-transformation happened, so I explored many things. Anyway, Pangaro (2019) in his 2011 keynote 'Design for Conversations & Conversations for Design' (Fig. 3.5), talks about Cybernetics and wicked problems, but talks particularly about how 'designing for design is undervalued and misunderstood'. Based on what you are saying (academic) this is an example of this, the design of the initial 'conversations' at the beginning may have been overlooked possibly, or not valued as an important part of the process",* says the student.

"It does make me wonder what 'conversations' they had about how to 'design the designing' (Fig. 3.5) with our transformation project" says the academic. *"Fig. 3.5 could be applied to projects, courses, modules, even my doctoral thesis"* says the pracademic. *"Is it an issue within Fig. 3.5, that you can't directly go from 'Designing' to 'Means'?"* the academic adds. *"If it's a system, does it need to? The way I see Fig. 3.5 is this, each 'conversation' serves a function within this system, equally contribute to improve the system as a whole: synergy"* suggests the student.
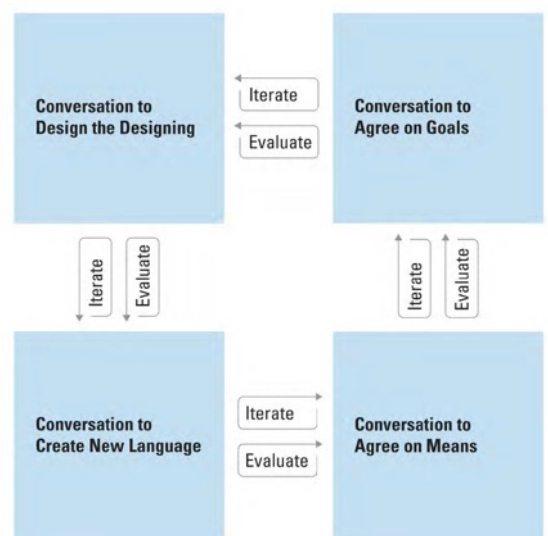
Figure 3.5 – Design for Conversations & Conversations for Design. (Pangaro, 2019).

A brief Cybernetics *'conversation'*

"If it's ok with you guys, I'd like us to briefly explore Cybernetics; I don't necessarily want us to get side-tracked but what is Cybernetics exactly?" asks the pracademic. The student searches on his phone and asks both of them, *"can I refer to a Wikipedia (2019) entry? Because they say"*:

> *"Cybernetics is a transdisciplinary approach for exploring regulatory systems – their structures, constraints, and possibilities."*

"No let's leave Wikipedia alone" says the academic. *"I don't have a problem personally as a starting point, but some frown upon it, let's look elsewhere"*, suggests the pracademic. The student grins, *"No worries, what about Encyclopaedia Britannica (2019)? They provide a definition"*:

> *"Cybernetics – control theory as it is applied to complex systems. Cybernetics is associated with models in which a monitor compares what is happening to a system at various sampling times with some standard of what should be happening, and a controller adjusts the system's behaviour accordingly."*

"More reliable than Wikipedia, isn't there something better than this?" says the academic. *"Is the 'monitor' and controller' that 'adjusts a system's behaviour accordingly' human or machine?"*, the pracademic asks. *"Either way let's find something else"*, the academic quickly responds. The student searches again, *"Ok what about if I go back to Pangaro (2019). He posted this video 'What is Cybernetics?' on Vimeo in 2012, look what Pangaro says in the associated thread"*:

> *"Cybernetics is the art and science of systems that have purpose; as Pickering explains, the goal of a cybernetic system is to 'act effectively to achieve its goal', while other 'sciences' have as their goal to 'gain knowledge'. This may be the fundamental point to make."*

"Umm. I was about to say let's look elsewhere again but let me think for a minute" says the academic. The pracademic mulling over whether he's the *'monitor'* or *'controller'* ponders on Pangaro's comment, *'the art and science of systems that have purpose'*; where can I go with this? *"Shall I look again?"* asks the student. *"Hold on, I'm still thinking"* the academic says snappishly. *"No worries"* replies the student.

The academic postulates, *"we should seek out Pickering; but a 'fundamental point' here is Cybernetics is solution, not problem-driven to 'achieve its goal', informing my focus on **how**. If I focus on needing to solve a problem I'll continue to 'gain knowledge' of the perceived problem, possibly at the expense of achieving my goal or providing a solution(s). So, moving forward I need to be more 'solution or goal-driven'". "Shall I search again?"* asks the student. *"Actually, I've found a few eBooks by Pickering in our university library on my iPad"* the academic replies. *"Ok carry on"* says the pracademic.

The academic continues: the first book is called "*The Cybernetic Brain: Sketches of Another Future*". The academic goes through to the online reader, opens the book and starts to scroll. This book is about 10-11 years old, but from the contents page it outlines a history of cybernetics, there's references to ontology and epistemology; a whole array of things which would need a bit more time reading through some of it. The book is split into two parts: Part 1 – Psychiatry to Cybernetics and Part 2 - Beyond the Brain; there's a couple of chapters before. The academic continues scrolling. There's an interesting quote Pickering (2011, p.3) provides from Gordon Pask which might chime with you *(pracademic)* doing autoethnography with characters. *"What does it say?"* asks the pracademic. The academic reads out the following:

> *"To speak of a history, any history, as though there was but one somehow canonical history…. is misleading…. any entity, culture or civilisation…. carries innumerable, in some ways differing histories – Gordon Pask from Interactions of Actors, 1992".*

"We could be in the multiverse" laughs the student. The pracademic chuckles, *"indeed, but it's interesting because we do bring different histories, different perspectives of built environment education, over a significant period of time. Even now we are creating another 'history', or reality in the multiverse as you (student) might say, through the interaction we are having now; actors playing roles".*

The academic chips in, in continuing to scroll, Pickering (2013, p.19) starts to talk about *'non-modern'* cybernetics, which refuses to split people and things, hinting toward hybrid ontological positions. *"That's interesting when I think of autoethnography and hybridity in respect to ontology (Reed-Danahay, 1997)"* the pracademic replies. *"It's over my head, I keep thinking of oncology"* says the student. *"No, we're not, ontology is a bit different, it has a bit more philosophical meaning in respect to reality, a conversation in itself"* replies the pracademic. The academic cuts in, actually Pickering (2011, p.20) discusses Ross Ashby and *'Black Box'* theory; a *'Black Box ontology'* Pickering calls it, that there's a performative and adaptive nature to it. *"Oh right"* replies the pracademic with a frowny thoughtful face. The academic reflects for a moment, actually for much of our daily lives we're confronted with *'Black Boxes'*; systems that we don't fully inspect how they work, yet they provide a means for accessing and extending our own knowledge to educate ourselves; we do stuff we can't explain, we do them intuitively or instinctively. Pickering (2011, p.20) refers to Ashby (1956: 2015, p.86) who offers a simple example, it's reading this briefly that me think of it:

> *"The child who tries to open a door has to manipulate the handle (the input) so as to produce the desired movement at the latch (the output); and has to learn how to control the one by the other without being able to see the internal mechanism that links them."*

"I can relate to that I can't explain half the stuff I do sometimes, I ain't gotta clue how my brain works, but hey I'm not a brain scientist" says the student. *"I would agree with you, I'm still trying to figure out where to take this investigation, but happy to let it flow for now"* replies the pracademic. Actually, reading a little further Pickering (2011, p.20) in referring to himself (Pickering, 1995) says:

> *"A Black Box is something that does something, that one does something to, that does something back – a partner in, as I would say, a dance of agency. Knowledge of its workings on the other hand, is not intrinsic to the conception of a Black Box – it is something that may (or may not) grow out of our performance experience of the box."*

The student chips in, *"so, in thinking about your (pracademic) investigation we could use a conceptual 'black box' as means to orientate us couldn't we?"*. The pracademic pauses *"how so?"* he asks. The student continues: ok, you'll have to bear with me. Right, a *'Black Box'* has an input and an output, I'm gonna draw on Fig. 3.2 (p.51) for a minute also, we spoke about *'graduate attributes'* as an output; as an *'artefact of output'* and there being a connection to institutional strategy, you *(pracademic)* are also looking to provide insights in this investigation. We can develop the *'conversation'* around the *'Black Box'*, without having to explain the full inner workings of it; we can provide the casing around it to help tease out what is needed. For example, look at this (Fig. 3.6); I've brought together my points as if I'm thinking as you *(pracademic)* and your *'ontological Black Box'*, I've just exploded the casing round it so you can see it.
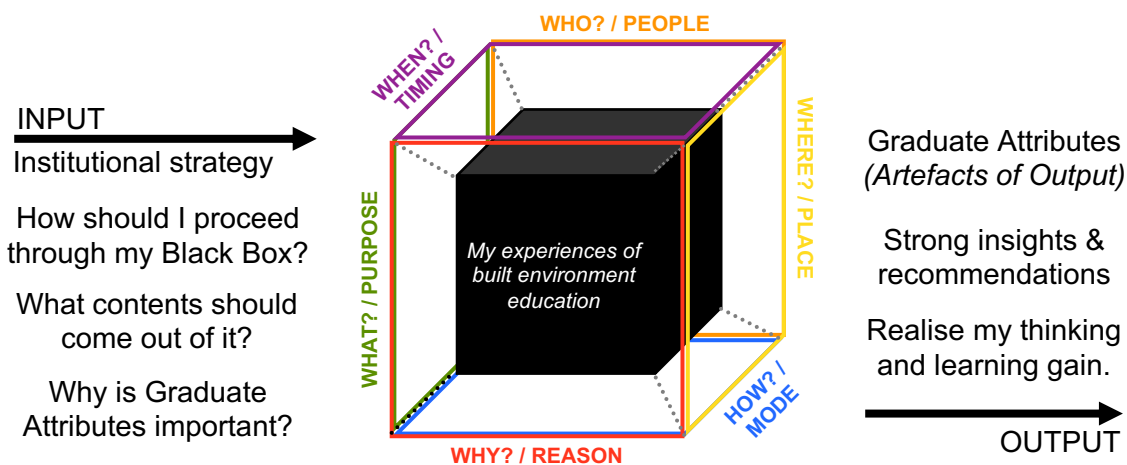
Figure 3.6 – My 'ontological Black Box' (by author, questions informed by Fig. 3.2, p.51).

The pracademic initially bamboozled sits looking at Fig. 3.6. *"I've never had an 'ontological Black Box' before. But I guess what you're saying is we can just use it to think about where we're going, to see where it leads us; from which I can pick out key themes to explore and focus my investigation further. I'll go away and explore cybernetics some more, but for now I think we need to come back to built environment education again; but thank you it's given me food-for-thought"*.

"Let's get back then to what I was interested in hearing more about, tell us about the analysis you did of similar courses, please", asks the pracademic. *"Yeah sure",* replies the academic. First I compared our programme with what we did previously. We offer degrees for a number of disciplines, but there was something quite glaringly obvious. *"What was it?"*, asks the pracademic. I'd rather not elaborate too much on our own course. *"Just an outline will be good"*, replies the pracademic.

The academic continues; changes resulted the following year, which I contributed to. I also learned a valuable lesson, in my eagerness to fit in and better understand what we were collectively trying to achieve, I was also unearthing deeply rooted cultural issues in the department. *"What sort of issues?"* asks the student. It may be wise to focus on what I gained from the analysis of different courses, otherwise our *'conversation'* might turn a bit dry. *"Nuff said"* replies the student. But the lesson learned was to explore ideas and if someone's interested tell them, their interest makes the *'conversation'* different. Besides I started to think about potential doctoral research topics, I hadn't enrolled on any programme just thinking about it.

And so my *'itch'* grew: I wanted to get a better understanding of how our course compared to others, I continued to follow Harland's (2012, p.91) advice and look across the sector. I looked at comparable courses (Fig. 3.7, p.60), including architecture if it was integrated with other disciplines. I worked through a rankings list, solely to identify potential institutions; ranking was irrelevant. All information was freely available from their own websites, which had a bearing on those selected.

A variation of Fig. 3.7 (p.60) I presented at conference, my focus was on curriculum design and I asked the audience a range of questions; how can we adequately benchmark the sector in respect to the Teaching Excellence Framework (TEF)? How do institutions or professional bodies really know if a course, or degree is any good in reality? What makes for a good curriculum? I also asked; as a graduate how would I know if I'm any good against other students? *"Yeah, how would I know if I, or my degree are any good, especially when I'm competing for a job?"* says the student. *"There's a significant variation in modules within Fig. 3.7 (p.60) isn't there"* says the pracademic. The academic continues that's a particularly interesting aspect, it made me think about the staff experience, particularly our course team; more so than students. We were woefully under-resourced, we could be stretched across many modules; more so than students. It made me think about the *'size and weight'* of courses, how modules impact both individually and collectively; marking and assessment of them particularly.

Figure 3.7 – Comparable built environment courses from nine institutions, based on the 2016/17 academic year and their own website data. (By author).

The pracademic and student cast their eyes over Fig. 3.7 (p.60) both intrigued by the different approaches just within these 9 institutions. *"There really is a mixed bag isn't they? Some courses appear integrated and some focus more on individual disciplines; what's the best approach?",* asks the student. *"Good question"* says the pracademic. The academic begins to explain some of Fig. 3.7 (p.60). Once I collated the data and reflected upon it with my own observations of our course, an initial question I had was; does course variety come at the expense of course quality? We had pathways that were a huge drain, they were probably not doing those students, our staff, or the institution any good, but as a department we persisted with them. *"Tell me some more about the marking and assessment please, that sounds more interesting than course politics; why did this interest you particularly?"* asks the pracademic.

	LEVEL 4						LEVEL 5						LEVEL 6					
Institution 2	BE	CM	QS	BS	AT	Arc.	BE	CM	QS	BS	AT	Arc.	BE	CM	QS	BS	AT	Arc.
		■	■	■	■			■	■	■	■			CM	QS		AT	
		■	■	■	■			■	■	■	■			CM	QS	BS	AT	
		■	■	■	■			CM	QS	BS	AT			CM*	QS*	BS*	AT*	
		■	■	■	■			CM	QS	BS	AT			CM*	QS*	BS*	AT*	
		■	■	■	■			■	■	■	■							
		■	■	■	■			■	■	■	■							
	BE	CM	QS	BS	AT	Arc.	BE	CM	QS	BS	AT	Arc.	BE	CM	QS	BS	AT	Arc.
	LEVEL 4						LEVEL 5						LEVEL 6					

Legend: ■ All offered disciplines aligned | CM+QS | BS+AT | CM+BS+AT | Ind. Individual disciplines

Figure 3.8 – Focus on one course to highlight potential impact of assessment of marking modules, extracted from Fig. 3.7, p.60. (By author).

The academic refers to Institution 2 for an example (Fig. 3.8), it's a course with low modules (33). Yr1 (level 4) has *'common'* modules for all disciplines; 6 across four disciplines, say each module has 2 assessment points (ap), an assumption drawn from my own experience of courses. Yr1 (level 4) equals 12 assessment points (ap). Yr2 has 4 *'common'* modules (8ap), 2 modules (4ap) spanning two disciplines (CM+QS) and (BS+AT), and 4 individual modules (8ap); Yr2 (level 5) equals 20 assessment points. Yr3 caters more so for individual disciplines; there's 2 modules (4ap) across three disciplines (CM+BS+AT) and a module (2ap) spanning two disciplines (BS+AT), there's 14 individual modules (28ap); Yr3 (level 6) equals 34 assessment points.

Over 33 modules Institution 2 (Fig. 3.8) may have 66 assessment points (Yr1: 12, Yr2: 20, Yr3: 34). A crude analysis and there's more variables to consider, but cast your eye back to Fig. 3.7 (p.60) what about institutions with high modules; double the assessment? What about staff workload, for assessment and administration? How efficient and sustainable are courses? Some students could be working a lot harder for the same qualification. *"I'm starting to appreciate even more why I hate modules"*, the student laughs. *"Let's come back to this for a moment"* suggests the pracademic.

Modules and their impact

The pracademic comes back to an earlier part of the conversation and turns to the student, *"you said you don't like modules, actually hated modules them (p.61), can you elaborate; why you do not like modules?"*.

The student thinks for a moment, a couple of things really frustrated me with modules. First, group work; really frustrating and time consuming, there were times where I did significant amounts of the work, yet others got the same mark. Some students just couldn't organise or manage themselves; I was lucky in the end a few of us stuck together. If you complained to staff, you got *'this is what's it's like in industry',* I've worked in industry and it's not the same as student group work. *"If I can…"*, the academic tries to butt in. *"Sorry I haven't finished"*, the student says sharply. *"Carry on",* says the pracademic. I think staff forget that as students we pay £9k a year to study full-time but still have to work part-time, sometimes I've had to do 30 hours a week in different jobs at times, so chasing or picking up the work of others is really stressful. *"Is this really about modules or just a rant?"* asks the academic flippantly. *"Let him finish"*, says the pracademic. The student continues, group work in multiple modules was knackering, at times impacting some of my individual assignments, to the point where I was just processing information and submitting work to meet learning outcomes. I got good grades, but on reflection now I think it was at the expense of my own learning at times.

"Sorry for trying to butt in, I was going to add to your (student) point about; 'this is what it's like in industry' reference. Davies (2016) discusses this very thing, a great source I made it a key textbook for modules I designed and led. Davies (2016, p.88) says".

> *"Some lecturers don't see the difficulty with group work. A pet hate of mine is when a lecturer fends off complaints about group work by saying, 'well, that's what it's like in industry'. This is only true in the sense that people work in teams in industry and all members of a team must demonstrate some team-working skills for a successful outcome".*

"When I began working in academia this was and still is something that bothers me, the attitude of staff in respect to group work, amongst other things" says the academic. *"Ok, it may be worth coming back to this, but I want to bring the focus back to modules"* replies the pracademic. *"You had a couple of things that frustrated you with modules"* the pracademic says to the student. Yes, another real frustration is quite poignant really considering Fig. 3.7 (p.60), the number of modules, the amount of work required in each of them and submission dates being so close together. How are you supposed to produce your best work with so many submissions together? *"Many courses are an engineered kit-of-parts, as opposed to coherently designed experiences unfortunately"* the academic says tongue-in-cheek.

"I continually raise awareness of the impact of decision fatigue" says the academic. *"What's that?"* the student asks. The academic explains *"I first read about it in an article on Twitter. Heritage (2014) talks about decision fatigue as"*:

"*A real condition where you become overloaded with so many pointless decisions that your productivity ends up falling off a cliff".*

"I highlight decision fatigue in my lectures to raise awareness about managing their time well (Fig. 3.9), but I first observed it in staff as we prepared to introduce our 'transformed' modules" the academic adds. *"Pangaro (2019) discusses information overload in his keynote I spoke of earlier, it sounds similar"* says the student. *"This feels like a particularly important aspect to consider, Kinman (2017) refers to change fatigue and academic burnout; this may explain some of the behaviour you observed in staff. This is interesting and needs further exploration, but I'd like us to come back to assessment and feedback please"* says the pracademic.

Figure 3.9 – A lecture slide raising awareness of decision fatigue (By author).

The academic continues: assessment *'bunching'* is an issue, the institution acknowledge courses and assessment need simplifying. However, the disconnect between institutional vision and department interpretation with the transformation project, just meant *'business as usual'* to a large extent, especially at course level. *"Why course level particularly?" asks the pracademic.* There's too many viewpoints and opinions, individual agendas, which just develops into a collective resistance to change. As staff we can get complacent and operate within our comfort zones. *"But surely to challenge students and take them out of their comfort zones, you need to also?"* says the student. Despite asking the initial question, the pracademic intervenes; *"It really interests me how the actions and beliefs of staff may transfer into the learning experience, but let's stay out of the departmental culture for now. We're straying away from modules and their impact; it may be a good time to take the conversation in a slightly different direction. I would like us to stay at a sector/ institutional level, it would be good to explore more so the relationship between construction and education; let's discuss the disciplinary impact, that may better orientate us moving forward".*

Disciplinary impact on built environment education

Drawing upon Fig. 3.7 (p.60), the pracademic talks about when he first came to work in academia; *'Collaboration for Change'* a report conducted by The Edge (2015) had not long been out, the latest in a long list highlighting issues with the construction industry. Latham (1994) and Egan (1998) with others have contributed to improvements, but they only really begin to skim the surface of inherent problems with industry. *'Collaboration for Change'* (The Edge, 2015, p.7) provides some useful insights and continues to keep the *'conversation'* going, it highlights and discusses the generally known *'silos'* of both industries stating:

> *"The siloed nature of the built environment's education system needs to be reviewed, on a cross-disciplinary basis to see how institutions can use their badging to promote construction as a career of choice in a way that engages current and future generations, demonstrating relevance, encouraging greater integration and preparing future professionals for work in a multi-disciplinary environment."*

I'll refer to *'Collaboration for Change'* (The Edge, 2015) where necessary but want to focus on the *'disciplinary'* aspect, inform the *'conversation'* we've had about modules and to a lesser extent disciplines, which I'd like us to move towards.

I've spent a considerable amount of time in the construction industry; worked and studied in different institutions, through a range of different delivery approaches; units, modular and non-modular, across many disciplines and sectors. I've read widely not just about built environment education, but education generally from early years up to doctoral level. I think a real problem is how we compartmentalize, or 'silo' built environment education. What you've *(academic)* highlighted in Fig. 3.7 (p.60) reflects what *'Collaboration for Change'* is suggesting. You *(student)* referred to a Buckminster Fuller quote being in your journals, I'm going to refer to Gerber, who also draws inspiration from him; Gerber (2001, p.27) highlights:

> *"Starting as it does with parts, traditional Western education, if ever, progresses to the whole."*

We spend too much time focused on individual *'parts'*, over-complicating the *'whole'* experience. As a learner I don't like compartmentalised boxes constructed by others, I like constructing my own. *"Do you hate modules like me?"* the student says jokingly. I wouldn't go as far as that; I find them unnatural to how I learn. Compartmentalizing built environment education as we do hinders true synthesis of practice; it undermines the learning experience itself and the value students place on it in my view. Modules force intelligent people to operate very unintelligently. *"But we need a way of breaking down the learning in order to assess students"* says the academic. I totally agree, so managing *'silos'* is important.

We digressed slightly; I was thinking about the analysis of comparable courses, which reminded me of *'Collaboration for Change'* leading me to something else. Fig. 3.7 (p.60) highlights significant variations across a small sample of built environment education, but it also offers an insight into the disciplinary approaches taken within them. Beginning my PGcertHE I explored the integration of disciplines within a common curriculum, which led me to this curriculum integration curriculum (Fig. 3.10). It's not drawn from or focused on built environment education specifically, but useful to reflect on the integration between built environment disciplines.

None   **High**

Discipline-Based	Parallel Disciplines	Multidisciplinary	Interdisciplinary	Transdisciplinary
Content is presented in separate blocks of time without a deliberate attempt to show the relationships among the disciplines[5]	Content of the different disciplines are sequenced in certain ways with the hope that students will discover implicit linkages[5]	Related disciplines are presented together in a unit or course structure to study a theme or issue and show the complementarity of the disciplines[5]	Units or courses of study from the various disciplines are deliberately presented together in ways to explicitly show the interconnectedness of the disciplines[5]	Subject areas are presented in a totally integrated fashion.[2] Students use a shared conceptual framework, drawing together discipline-specific theories, concepts and approaches to address a common problem.[1]

Figure 3.10 – Integrating the curriculum (Ideas to Implement, 2019).

Fig. 3.7 (p.60) highlights a mix of disciplines, but how do they align with Fig. 3.10 in reality? Asks the pracademic. *"With disciplines covering architecture, engineering and construction (AEC), courses are multi or interdisciplinary. But I guess you could say some institutions Fig. 3.7 (p.60) sit within the first two categories of Fig. 3.10",* says the academic. Fig. 3.11 represents some courses currently; I question how integrated some are. *"These disciplinary models (Fig. 3.11) represent disciplinary attitudes within built environment education"* the academic replies.
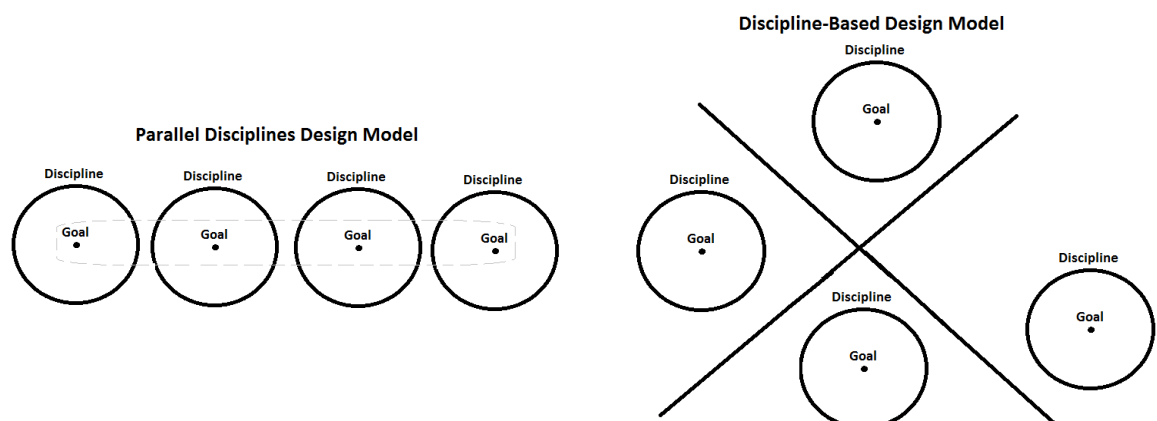
Figure 3.11 – Disciplinary Models (Ideas to Implement, 2019).

The academic expands on his comment, *"take the discipline-based design model (Fig. 3.11, p.65), architecture and architectural technology, have different goals to other disciplines, more design emphasis; architectural education is a different pedagogy."* A valid point, not where I was going necessarily; I was going to focus on how institutions attempt to deal with longstanding issues which *'Collaboration for Change'* (The Edge, 2015) highlights; such as fragmentation and specialisation of disciplines in both construction and education. But I think there's a connection with your *(academic)* point. *'Different pedagogies';* I will need to re-visit pedagogy, thank you.

Multidisciplinary Design Model

Discipline

Goal

Discipline   **Theme**   Discipline

Goal   Goal

Interdisciplinary Design Model

Goal

Discipline   Discipline   Discipline
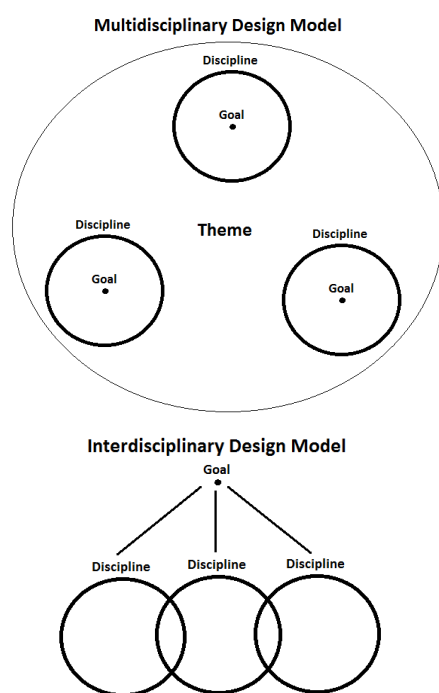
Figure 3.12 – Multi/ Interdisciplinary Models (Ideas to Implement, 2019).

Fig. 3.7 (p.60) makes me think about the vulnerability of certain disciplines in courses with any model, Fig. 3.11 (p.65) or Fig. 3.10 (p.65). Cullen et al (2012, p.28) discuss how disciplines can divide communities, they highlight how power, hierarchy and control can be issues. *"So despite the portayal of a common goal they may actually have bigger issues?"* says the academic. We'd need to explore these courses further to know if there's any issues so we'll have to reserve judgement for now.

The pracademic continues. What particularly interests me with courses that follow the models in Fig. 3.12 is; how pre-professional ideologies impact. *"I'm not sure I follow?"* replies the academic. Ok, I'll forget built environment disciplines for a moment.

I've also held a faculty employability role, which informs my thinking here. Hosein and Rao (2017) and Hosein (2018) explored the impact of pre-professional ideologies; professional disciplines use specific pedagogies, which leads to an expected career trajectory of training; an accountant, or architect for example. Students, and I'll focus on undergraduates, sign up to disciplinary titled degrees, yet may or may not go into these professions. The academic chips in, *"I've actually had a student studying quantity surveying ask what a quantity surveyor does!".* Both the student and pracademic look at him. *"You are kidding right?"* says the student laughing. *"Nope"* the academic replies. The pracademic about to continue is quickly interrupted by the academic, *"actually what I find fascinating is how students even when starting, refer to themselves as; I'm an architect, I'm a QS, or I'm a construction manager. I'm like no you're not and you won't be as a result of your degree. Pre-professional ideologies, hmm!"*

66

The student listening to the academic replies, *"actually I can vaguely remember doing this, but never thought anything of it. I suppose when you sign up to a degree, you just assume that profession or mindset? How weird. Perhaps it's because most staff tend to be from those professions?".* The pracademic suggests moving on. About to continue the academic interrupts the pracademic once more, *"actually thinking about it some more, do you think this contributes to indoctrinated education?"* Within built environment education I would say so, probably at inappropriate levels. *"Inappropriate levels?"* asks the student. *"Yeah, what do you mean by that?"* the academic adds. I think undergraduate is an inappropriate level to think about disciplines, it channels the mindset in my view too early, especially if *'students do not know what they do'!* *"Point taken"* says the academic laughing.

The pracademic expands on his comment; how can you really explore what the *'built environment'* offers, if you are pre-occupied studying for a discipline which may not even be your eventual profession? *'Collaboration for Change'* (The Edge, 2015) is just one example highlighting longstanding issues with fragmentation and specialisation; how do we address these issues with our current educational models? *"I take your point, it's made me question if disciplinary training is higher education?"* says the academic. *"I wish somebody said this before it cost me so much"* says the student through gritted teeth.

I do think higher education has its place; but at undergraduate level I think disciplines *(parts)* contribute to the *'whole'* not being realised (Gerber, 2001, p.27). In respect to employability, how are students prepared for multiple careers, if trained or educated with a disciplinary mindset? Thinking of pre-professional ideologies, do educational programmes sufficiently equip students for multiple careers? We must get back though to the disciplinary models, particularly this transdisciplinary model Fig. 3.13.

Fig. 3.13 may be a useful model to explore with your analysis of comparable courses (Fig. 3.7 (p.60). Not sure splitting *'skills'* and *'real-life problem (PBL)'* is helpful but having a central *'goal'* may inform your own conceptual ideas for curriculum design. *"Thanks I'll look at this"* says the academic. Taking in a deep breath; right, I must get back on track; need to focus on my doctorate the pracademic says out loud. *"What do you actually need to do to achieve it?"* the student asks.
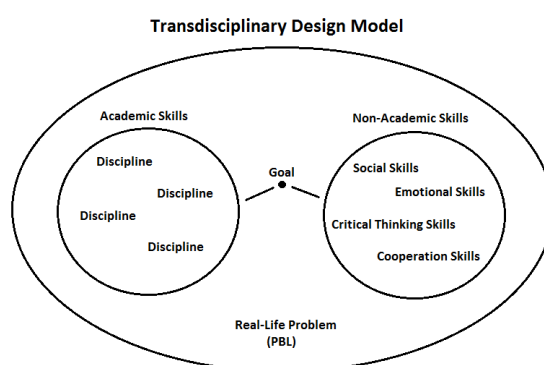
Figure 3.13 – Transdisciplinary Model (Ideas to Implement, 2019).

QAA criteria and achieving *'doctorateness'*

The pracademic caught a little by surprise by the student's question pauses for a moment. I need to meet the assessment criteria associated with my DProf. Part of my DProf is also master's level with its own assessment criteria, it's a little confused to be honest, a bit woolly where one finishes, and one starts. *"You're not wrong, I've just started my doctorate and trying to get my head round the regulations, what a total head f*** that is"* says the academic. The pracademic laughs. *"Whoops, sorry"*, says the academic. I need to achieve what the Quality Assurance Agency for Higher Education (QAA) sets out for level 8 doctoral study. *"What does that say?"* asks the student. The QAA (2014) provides *'guidance on applications for the grant of research degree awarding powers'*, within Annexe 2 the qualification descriptor for doctoral degrees states;

> *"Doctoral degrees are awarded to students who have demonstrated:*
>
> * *The creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication.*
>
> * *A systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice.*
>
> * *The general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in light of unforeseen problems.*
>
> * *A detailed understanding of applicable techniques for research and advanced academic enquiry."*

My DProf has a dual requirement of both making a contribution to knowledge and practice (Fulton et al 2013, p.9), primarily developing my own *'individual professional practice'* (QAA, 2014). All three read through the QAA criteria, the student deep in thought asks, *"Where are you with this QAA criteria? Actually, where are both of you with it? How are you using it to guide you?"*. Both the pracademic and academic look at each other; the pracademic frowns and shrugs. The student continues *"You're (academic) transformation project (Fig. 3.1, p.49), Pangaro's 'conversations' (Fig. 3.5, p.55), the QAA criteria (above); I'll make it more visual for you (Fig. 3.14). It's a 'conversation' to design, a system, one with an 'output' (blue circle), isn't it?"*.
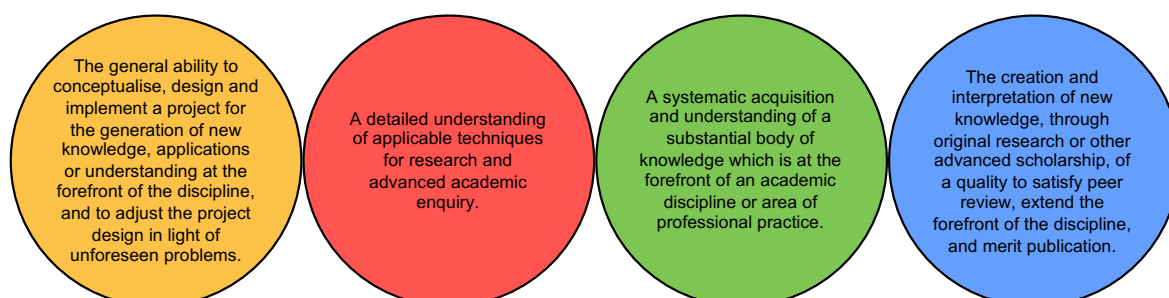
Figure 3.14 – Graphical representation of QAA criteria for doctoral level 8 (By author).

The pracademic and academic look at each other, both burst into laughter. The student unsure whether they're laughing at him or not, sits back in his chair; *"what's so funny?"* he asks. *"How often do we overlook the criteria or learning outcomes? You would think as a reasonably well-travelled student I would learn wouldn't you, especially when I tell students to do it all the time"* says the academic. *"I learnt that lesson with my degree"* says the student feeling more at ease. The pracademic grinning continues. I wasn't thinking of this but it's a great observation, I was thinking of something else. A constant concern is ethics, adapting to autoethnography and thinking about how to write whilst *'pushing the boundaries'*. The pracademic refers to Chang (2008, p.67), who highlights the importance of planning a writing strategy:

> *"Without content to write about and with the fear of influencing the research process with preconceived notions of predicted outcomes, you may be inclined to ignore the careful planning of a writing strategy"*.

This is something I've had to consider continuously, how I impact myself and others. *"How do you not influence this research with preconceived notions of predicted outcomes?"* the academic asks. Honestly it worries me, but my approach has been to explicitly acknowledge it in my writing, after all this is a DProf based on personal experience. The pracademic continues, another concern is something Denzin (2014, p.70) makes about evaluating autoethnography itself:

> *"Autoethnography cannot be judged by traditional positivist criteria"*.

The academic asks, *"is this a limitation of the method or positivism itself?"*. I'm not sure if they are limitations yet. But if the QAA or my assessment criteria is rooted in positivism then there may be an issue. Positivism appears to dominate built environment research (Zou, Sunindijo, Dainty, 2014), re-imagining it through autoethnography might be a challenge potentially. *"Surely being doctoral means 'pushing the boundaries', challenging the thinking of others, make them question their beliefs and values?"* says the student. *"It's a bit limiting having 'forefront of the discipline' in the blue circle (Fig. 3.14, p.68); what discipline would you be at the forefront of?"* the academic asks. The pracademic rubs his chin; *'more to think about!'*

The academic returns to Chang's point *(above)*, *"surely the whole research process revolves around 'preconceived notions and predicted outcomes doesn't it?"*. The student chips in *"based on the blue circle in* Fig. 3.14 (p.68), *doctoral success comes down to a 'conversation'; an exam that satisfies 'peer review', it's pretty difficult to predict an outcome for that isn't it?"*. *"It is"* replies the pracademic. The academic continues *"You asked where we're at with the QAA (2014) criteria; for me Trafford and Leshem (2008) and a conversation they provide on 'quadrants' has captivated me"*. The pracademic asks him to continue.

Trafford and Leshem (2008, p.20) focus on questions in doctoral viva's, placing them into four quadrants; Trafford and Leshem (2008, p.18) state *"it is reasonable to suppose they follow certain patterns"*. Harland (2012) has helped me to *'swim'* in academia; Trafford and Leshem (2008) has helped to elevate my thinking but has led me on a merry dance through exploring good and poor viva models (Fig. 3.15), whilst exploring *'quadrants'*.

Trafford and Leshem (2008, p.18-21) suggest viva questions *'follow certain patterns'*, PhD or DProf not explicitly stated; validity of *'question patterns'* hard to explore. Suggesting questions *'follow certain patterns'* led me to think of a viva as something to design; can *'question patterns'* be predicted? Seeing Fig. 3.15, which Trafford and Leshem (2008, p.37) present as *'good/ poor'* models of vivas I thought; are these models the wrong way round? If PhD's and DProf vivas *'follow certain patterns'*; is it *'reasonable to suppose'* they have different *'question patterns'*? Fig. 3.15, depending on perspective, academic or practitioner; shouldn't questions for a DProf have a discussion evenly spread across all quadrants? How does it impact DProf students if all examiners are academics, who may *'follow certain patterns'* similar to a PhD? Trafford and Leshem (2008, p.38) talk about *'components of doctorateness'* stating, *"when synergy exists between the components then doctorateness is demonstrated"*; how can synergy exist in a *'good'* thesis/ viva discussion if its only in two quadrants?
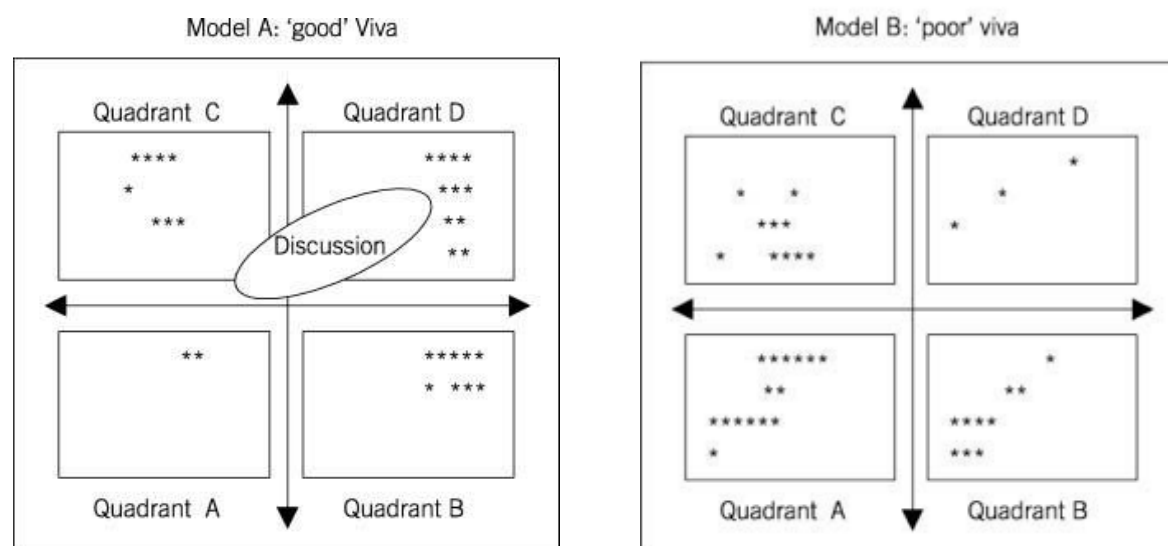
Figure 3.15 – Modelling emphasis of questions in a 'good' and a 'poor' viva. (Trafford and Leshem, 2008, p.37).

The pracademic reflecting on Fig. 3.15 is intrigued, *"I think there are some really interesting points in here, the dynamics of viva models interest me because I feel they're under-utilised at lower levels of built environment education: however, exploring 'question patterns' is a rabbit hole to get lost down; let's take a step back and just discuss 'quadrants' themselves, tell us some more about them cos I'm not sure I follow yet and want to be clear".*

70

'Quadrants' relate to question flow; 'examiners recognise and commend two significant approaches which the candidate had to research'. Fig. 3.16 outlines two distinct categories of questions 'innovation and development', and 'scholarship and interpretations'. Trafford and Leshem (2008, p.37) state also 'that each quadrant are singly and collectively important in the production of a doctoral thesis'. "But not enough to be in the discussion in the good viva model in Fig. 3.15 (p.70), that's odd!" says the student.
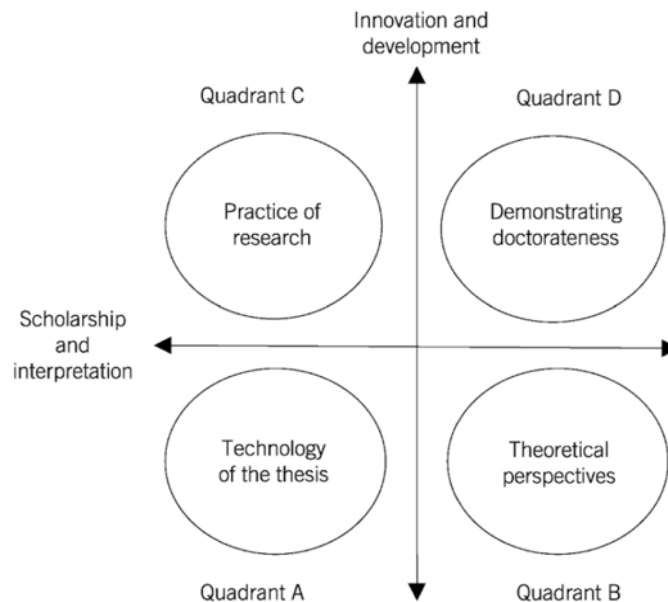
Figure 3.16 – Significance of questions in a doctoral viva. (Trafford and Leshem, 2008, p.20).

Reflecting on Fig. 3.16 the pracademic looks back at Fig. 3.1 (p.49) and Fig. 3.14 (p.68), *"I'm not sure where else you (academic) are going with 'quadrants', but I see synergies between 'graduate attributes' and 'demonstrating doctorateness' in Fig. 3.17. However, we're not really answering the original question if the QAA criteria is derived from positivism; but there is something interesting here, we possibly just need to travel a little further and come back to it. Let's keep the creative juices flowing but just change our focus for now".*
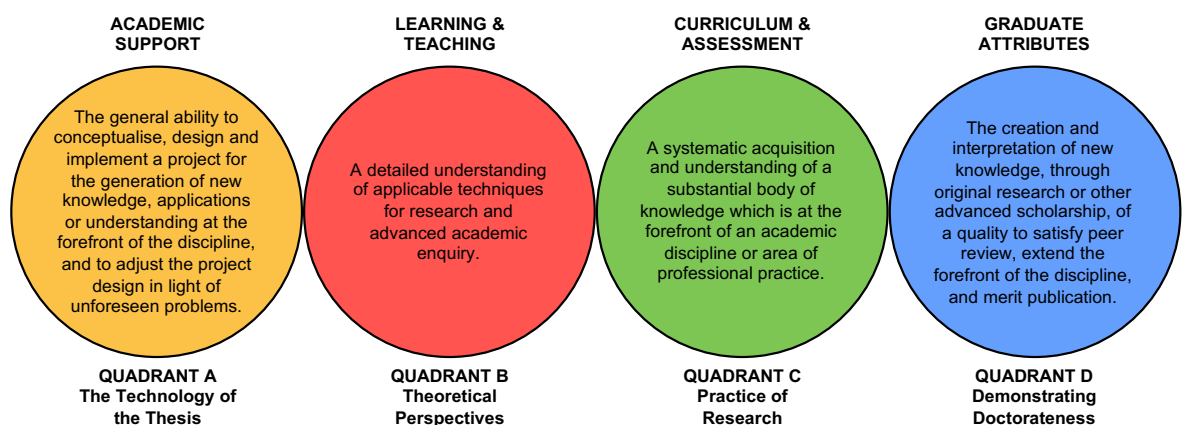
Figure 3.17 – Synergising Fig. 3.1 (p.49) transformation project themes with QAA criteria (Fig. 3.14, p.68) and Trafford and Leshem (2008, p.20).

Synergising institutional strategy and professional body criteria

The pracademic asks the academic to continue talking about other areas he investigated in his *'really creative period'*. *"Ok, I spent quite a bit of time exploring our institutional strategy and professional body criteria. Institutional strategy as a result of the transformation project (Fig. 3.1, p.49), and professional bodies as a result of the analysis of comparable courses"*, says the academic. The pracademic replies, *"tell us some more about the professional body criteria first"*.

What particularly interested me with professional bodies was; what are the *'common'* or core subject areas? Built environment education is over-complicated and narrow in my view, especially when compared to what the *'built environment'* can encompass (McClure and Bartuska, 2007). I researched professional bodies associated with the 6 disciplines in Fig. 3.7 (p.60), to search for *'common core areas'*. My thinking was; if derived from professional bodies this could be considered professional training, freeing up staff and students to explore *'the built environment'* with more imagination *'in theory'*; at any level. Based on what I've seen and experienced, built environment education confuses assessment. The student bounces forward in his chair rather excitedly, *"shall we have a go at designing?"*. *"Whoa, I'm up for a laugh, but hang on, let's not get ahead of ourselves"*, says a panicked and increasingly anxious pracademic.

A range of professional bodies validate the courses compared in Fig. 3.7 (p.60) and provide course validation criteria. Davies (2016, p.67) states *"professional bodies have a big say in the content of degree courses",* which is managed at course level through course leaders associated with their respective professional body. Professional and academic qualifications are central to built environment education, but considering how many courses are validated it's challenging to find any clear and consistent criteria; possibly reflecting programmes compared within Fig. 3.7 (p.60), do professional bodies themselves compound the issue of benchmarking the sector? *"Why would they be interested in benchmarking the sector? They're possibly more interested in exposure; the more courses the better?"* says the pracademic speculating.

A programme leader manages all pathways in respect to curriculum and timetabling, the relationship between the programme and course leaders is hugely inefficient in my view; compounded by almost *'territorial'* agendas of those representing professional bodies, and institutional bureaucracy that's come with marketisation. *"What do professional bodies actually do? I don't get them, what's the point of them? We had events for networking, but I just forgot about them"* adds the student. *"We can explore what they do later let's come back to the criteria itself"* the pracademic suggests.

The Royal Institution of Chartered Surveyors (RICS) provided the most prescriptive criteria; not for undergraduate courses though, but via the Assessment of Professional Competence (APC), for both Building Surveying (RICS-BS, 2017) and Quantity Surveying (RICS-QS, 2017). The APC is a professional assessment that is undertaken generally after a degree, but it appears there's potential for this to form a significant part of undergraduate education. *"I've just searched these references but can't find them?"*, says the pracademic. It's ok I collated all the data for 5 disciplines*; why only 5 disciplines?",* asks the pracademic. I didn't do architecture, apparently they're *'different'* to everyone else! Both the pracademic and student chuckle.

I'll come back to architecture and the RIBA. I searched for criteria from the Chartered Institute of Building (CIOB, 2017) in respect to Construction Management, their education framework was really helpful and helped negotiate the overly prescriptive APC criteria from RICS. CIOB criteria was probably the most consistent, helping to further cross-reference information from the Chartered Institute of Architectural Technologists (CIAT, 2017) for Architectural Technology; and the Chartered Association of Building Engineers (CABE, 2017) for Building Engineering. *"I've just checked most of these references on my phone but they don't work now"*, says the student. *"I have a spreadsheet should you want it at all"*, says the pracademic. *"I've searched all these professional bodies, the only one I can get some data on quickly is the CIOB (2020); the 2018 edition of the Undergraduate Education Framework",* adds the student. I wouldn't worry too much I was actually only interested in finding core subject areas. The APC criteria was useful for highlighting what it considered mandatory, core and optional subjects; a very comprehensive list of subject areas with the APC criteria.

"Why validation criteria aren't so accessible leads me to question if it's deliberate, would it impact professional bodies themselves if they did so?", asks the curious pracademic. I must admit it's not something that interests me that much if they did. *"But with the marketisation of higher education placing greater emphasis on the relationship between academia and industry bodies, are they providing sustainable solutions needed for both, current and future professionals, and industry itself?"* asks the pracademic. Maybe but it's not something I'm particularly focused on. *"Ok, sorry I'm possibly being a little cynical, please carry on"* says the pracademic apologetically.

The academic continues; something I found odd looking through the validation criteria was that I couldn't find any theme that considered the learner. It talked about graduates, but focused outcomes on completion, not really on guiding learners in the process or during the period of study; the language used just felt *'odd'*.

"Why do you find this odd?" asks the pracademic. Well, if '*professional bodies have such a big say'* as Davies (2016, p.67) suggests, why do they not have a *'common'* or core subject area clearly attributed to the learner themselves? Which I will come to. *"I kind of get your point"* replies the pracademic. Anyway, I was focused on and identified 5 themes (Fig. 3.18), which with some interpretation represent the criteria of 5 disciplines and aligns with what the CIOB (2020) criteria currently outlines, so I continued.
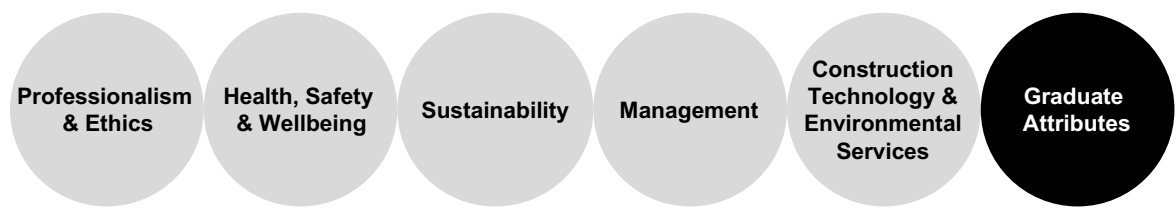
Figure 3.18 – Themes derived from analysis professional body criteria. (By author).

I reviewed the Royal Institute of British Architects (RIBA) criteria, in this instance they were *'different'*; they have both General Criteria (GC's) and *'Graduate Attributes' (GA's)* for parts 1 and 2 (Fig. 3.19). They have qualification descriptors for honours and master's degrees in the QAA (2020) benchmark statements, but I'll focus on GC's and GA's.

RIBA Graduate Attributes (Part 1)	RIBA Graduate Attributes (Part 2)
1. ability to generate design proposals using understanding of a body of knowledge, some at the current boundaries of professional practice and the academic discipline of architecture;	1. ability to generate complex design proposals showing understanding of current architectural issues, originality in the application of subject knowledge and, where appropriate, to test new hypotheses and speculations;
2. ability to apply a range of communication methods and media to present design proposals clearly and effectively;	2. ability to evaluate and apply a comprehensive range of visual, oral and written media to test, analyse, critically appraise and explain design proposals;
3. understanding of the alternative materials, processes and techniques that apply to architectural design and building construction;	3. ability to evaluate materials, processes and techniques that apply to complex architectural designs and building construction, and to integrate these into practicable design proposals;
4. ability to evaluate evidence, arguments and assumptions in order to make and present sound judgments within a structured discourse relating to architectural culture, theory and design;	4. critical understanding of how knowledge is advanced through research to produce clear, logically argued and original written work relating to architectural culture, theory and design;
5. knowledge of the context of the architect and the construction industry, and the professional qualities needed for decision making in complex and unpredictable circumstances;	5. understanding of the context of the architect and the construction industry, including the architect's role in the processes of procurement and building production, and under legislation;
6. ability to identify individual learning needs and understand the personal responsibility required for further professional education.	6. problem solving skills, professional judgement, and ability to take the initiative and make appropriate decisions in complex and unpredictable circumstances;
	7. ability to identify individual learning needs and understand the personal responsibility required to prepare for qualification as an architect.

Figure 3.19 – RIBA Graduate Attributes for Parts 1 and 2. (By author, adapted from RIBA, 2017).

Meeting GC's is the responsibility of institutions and course teams, they offer little as learning outcomes their focus is on providing a framework for structuring the course content. GA's offer better instructional value, informing learners what's required as they progress towards becoming graduates for parts 1 and 2; GA's aid evaluation of both learners and programmes, however, their instructional value can be overlooked in my experience.

74

The RIBA criteria feels like it's designed with people in mind both during and on completion of the period of study, there's partnership potentially in how the learning experience should unfold and can be achieved; they aid both learner's and educators, they can offer clarity to both guide the learning process and to evaluate on completion. *"I've taught in architecture; I have often asked why we don't build our instruction or learning outcomes around the GA's and map the GC's to them? However, people look at me as if I'm an alien; the GC's are too cumbersome, and as you rightly highlight offer little to learners in the process of learning. Personally, I think the design or thinking behind the instruction of learning can be over-complicated or misunderstood; GA's could be considered the 'output' you (academic) have been on about?"* says the pracademic. I think you may be right about instruction design; I began to appreciate this more starting my PGcert. *"So where did you go from here?"* asks the pracademic.

So, from 6 themes (Fig. 3.18, p.74) came the connection with Fig. 3.1 (p.49): *'Graduate Attributes'*. *"It's interesting sitting back and listening to some of what you're saying, it's given me a different perspective of my degree. I must track down the 'Graduate Attributes' where I studied, I'm intrigued now with your (academic) 'output' theory idea"*, says the student. *"Why?"* asks the pracademic. *"I fancy having a go at designing something myself now based on listening to you guys. As you've both agreed it all feels more complicated than it needs to be"* replies the student. *"We need to move on quickly"* the pracademic jokingly suggests to the academic.

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Figure 3.20 – Six strategic priorities derived from institutional data. (By author).

The academic comes back to discussing the learning and teaching strategy at his institution. I became interested in the strategic priorities (Fig. 3.20), which in this instance have been presented more generically; I thought there may be a pattern to explore. *"Why?"* asks the pracademic. The academic suggests to the student bringing up the latest edition of the CIOB (2020) education framework document on his phone. The student types it in, bringing it up; *"Ok, what am I looking for?"*. Look for '*The Education Framework Learning Outcomes*' please, what does it say? The student begins to read, *"It talks about themes being threaded through modules, and that CIOB doesn't prescribe how themes are incorporated"*. The academic stops the student, may I borrow your phone? *"Sure"* says the student handing his phone over.

The academic zooms in to see the content better. I'll cut out themes being threaded through programme modules and how themes can be used as individual modules for a moment, we can come back to this, CIOB (2020, p.5) states:

"The CIOB does not prescribe how the themes are to be incorporated into the programme and there is not a requirement to meet all the outcomes of the framework in order to achieve accreditation".

The pracademic digests what's been read to him, *"do you remember my earlier comment that professional bodies aren't interested in benchmarking the sector?"*. Yeah, what's your point? *"CIOB says they don't prescribe how 'themes' are embedded or delivered in courses, surely just confirming my point; why would they be interested in benchmarking courses if there's no need to meet all their requirements?"* replies the pracademic. The academic nodding, I see what you mean now. *"Anyway, continue with the point you were making"* suggests the pracademic.

The academic continues, basically the onus is on the institution or educational provider to interpret how they deliver their course; how the requirements are met to get their course accredited through the associated professional body, in this instance CIOB. So, my focus came back to what we were doing as an institution, as well as to the QAA subject benchmark statements relating to the disciplines for courses in Fig. 3.7 (p.60). *"Why not just go to the Construction Industry Council (CIC, 2020), they represent all professional bodies in the built environment"* says the pracademic. The Standards Directory the CIC provides, *'are generic and apply to the whole of the construction and built environment sector'*; CIC states its key purpose is:

'Plan, design, construct, manage and maintain the sustainable development and use of the natural and built environment and its infrastructure, balancing the requirements of all stakeholders'.

"The Standards Directory has 6 key areas, there's a link also to the National Occupational Standards (NOS)" adds the pracademic. *"If the CIC represents everybody why don't we just do away with individual professional bodies themselves?"* asks the student. *"Bless ya, you're funny"* replies the pracademic. *"Don't they just add to the 'silos'; the fragmentation issue you've been on about with 'Collaboration for Change'?"* says the student shrugging. Professional bodies do a good job raising the profile of the construction industry, with many members. *"Are you (pracademic) a member?"* asks the student. I'm not while I'm doing my doctorate, I've chosen to remain free of any professional body for now. The student asks the academic *"are you a member?".* I work in education and have my reasons, but we're getting distracted. *"Yeah, you're (academic) right we are, professional bodies are part of the 'system' if we think back to Pangaro and Cybernetics"* the pracademic points out. *"Touche"* replies the student.

I looked at NOS and the Standards Directory, both seem like quick places to get lost; over-complicated for my needs. *"Fair enough"* replies the pracademic. Once past the 6 key areas its section, sub-section, even sub-sub-section to a link with NOS. CIC provide *'Higher Education Graduate Common Learning Outcomes'* (CIC, 1998), Fig. 3.21 is helpful; however, this criteria emphasises professional training as opposed to *'higher'* education; the taxonomies need developing.

Personal Skills As a result of learning on this programme the student will be able to:	**Technical Knowledge** As a result of learning on this programme the student will be conversant with:	**Professional Knowledge** As a result of learning on this programme the student will be conversant with:
1. Select and use effectively the necessary range of appropriate written, oral and presentational skills.	1. The principles of planning, design and development and their application within the sector.	1. The principles of professional ethics and values across the industry, professional judgement and duty of care.
2. Select and use effectively the necessary range of numerical methods for calculating, checking and presenting solutions to problems.	2. The principles of current and innovative procurement processes.	2. The importance of sustainable development, environmental legislation, energy management and environmental impact.
3. Select and apply the necessary range of IT applications for preparing and presenting information.	3. Principles and benefits of integrated teams.	3. The principles and processes of legal frameworks, contracts, statutory control and the responsibilities and constraints they place on action and interaction.
4. Identify the aims and objectives of research needs and collect, organise, analyse, evaluate data and present findings.	4. The significance of clients and user requirements, factors affecting development and design fitness for purpose.	4. The application of health, safety and welfare legislation and responsibilities, and the processes of hazard identification and risk management.
5. Develop, maintain and encourage constructive working relationships which seek to avoid or resolve conflicts and differences.	5. The concepts of construction technology.	5. Economic principles and their application and significance to the sector and the principles of management and business operation and commercial risk.
6. Work effectively in teams through interpersonal relationships and group dynamics to agree goals, plans, review and evaluate progress.	6. The importance of design information, its development and communication to other parties.	6. Social, political and cultural issues and their implications and significance to design, development and use of the built environment.
7. Define, investigate and analyse problems of a non-routine and unfamiliar nature and apply judgement to devise practical and creative solutions.	7. The principles of project planning, auditing and monitoring.	
8. Review and identify own learning needs and resources, undertake personal development and evaluate achievements against targets.	8. The models of quality management.	
	9. The issues associated with project completion and learning from feedback.	
	10. The principles of the operation, maintenance, management and reuse of property, structures and services.	

Figure 3.21 – Higher Education Graduate Common Learning Outcomes. (By author, adapted from CIC, 1998).

"It's interesting with Fig. 3.21 how we compartmentalise knowledge and skills, could it be suggested that academic knowledge should be included?" asks the pracademic. *"Surely that's a step back rather than a step forward?"* replies the student. *The pracademic asks "why do you say that?". "Everybody keeps trying to compartmentalise knowledge in order to present it to the learner, it kind of misses the point to present this way; waste of energy"* replies the student. *"I take your point. Ok before we move on, you (academic) mentioned QAA subject benchmark statements, briefly talk us through what you found with those"* asks the pracademic. There's a lot of information with them to discuss briefly, I looked at five subjects that reflected courses compared in Fig. 3.7 (p.60) but my focus was on how they impact the learner/ graduate themselves. *"Ok give us a key point from each to take away"* asks the pracademic.

I'll summarise with Fig. 3.22, which includes the five subjects and the contents pages from each statement; I've not included the generic titles of how documents should be used, information about the statement and how it relates to legislation.

QAA Subject Benchmarks for	Contents pages from each subject benchmark statement	Key observation taken from each QAA subject benchmark statement
Architectural Technology (2019)	• Summary of changes from the previous Subject Benchmark **Statement** (2014) • Introduction • Defining principles • Nature and extent of architectural technology • Subject-specific skills • Teaching Learning and assessment • **Benchmark standards for honours degree** • Benchmark standards for mater's degree • Appendix	Within the benchmark standards (7.3, p.15) it states that; *"students should be conversant with the four main aspects of the subject: **design, technology, management and practice**".* *Four themes that offer a better focus to explore built environment education.*
Architecture (2020)	• Context the statement operates within • Qualifications in architecture: validation, prescription and quality assurance • Summary of changes from the previous Subject Benchmark Statement (2010) • Nature and extent of architecture • Defining principles • Learning and teaching • **Assessment** • Appendix	Method of assessment raises questions, particularly for design work in which 3.4 (p.17) states; *"While summative assessment should be based on clear and explicit criteria, the marking **process relies heavily on the expert judgements of discerning markers and examiners**".*
Engineering (2020)	• Summary of changes from the previous Subject Benchmark Statement (2015) • Introduction • Nature and extent of the subject • **The characteristics of engineering graduates** • Engineering degrees as preparation for professional practice • Professional accreditation of academic courses • Engineering at bachelor's degree with honours and master's degree levels • Teaching, learning and assessment • The standards • Appendix	Section 3 outlines the *'characteristics'* of engineering graduates and what they need to possess within 3.1 (p.5). The term *'characteristics'* is potentially a good way to starting thinking not just about learners, but also the process and the programme they study. Establishing synergies or *'needs'* of both and help to better evaluate success of of learners and programmes.
Land, Construction, Real Estate & Surveying (2019)	• Summary of changes from the previous Subject Benchmark Statement (2016) • Introduction • Defining principles • **Nature & extent of land, construction, real estate & surveying** • Knowledge, understanding and skills • Teaching Learning and assessment • Benchmark standards • Appendix	Within nature and extent the *'common requirements within all courses'* (3.26, p.9) highlights importance of knowledge integration to outline subjects including; **Measurement; Law; Cost and value theory; Design; Construction technologies; Management; Sustainability; Ethics, the public interest & professional standards**
Town and Country Planning (2019)	• Summary of changes from the previous Subject Benchmark Statement (2016) • Introduction • Defining principles • Knowledge, understanding and skills • Teaching Learning and assessment • Benchmark standards • Appendix	Within benchmark standards (5.4, p.10) reference is made to *'threshold, typical and excellent standards'*. This offers potentially a simplified way of grading both learners and programmes in respect to assessment of them.

Figure 3.22 – Five QAA (2020) subject benchmark statements and key observation taken from each. (By author).

"An area that sticks out in Fig. 3.22 is assessment; in architecture, the subjective nature of relying heavily on expert judgements can be an issue; town and country planning outlines threshold, typical and excellent standards is possibly better to support assessment and classification of grades" says the pracademic. The student adds *"'characteristics' within engineering in Fig. 3.22 intrigues me, I don't necessarily mean what the QAA subject benchmark says, but the principle behind it; 'graduate characteristics' as opposed to attributes".*

The academic continues: previously I've paired up Fig. 3.18 (p.74) and Fig. 3.20 (p.75) previously, they reflect thinking from my transformation project, which gave too much autonomy to staff to decide on the methods to embed them; many staff just forget about them. The pracademic suggests the 6 themes highlighted within Fig. 3.18 (p.74) can help to thematize research. Adams, Holman-Jones, Ellis (2015, p.77) say:

> *"Thematizing helps us imagine a logic or pattern to our narrative and to explicitly connect personal experience with culture. Thematizing also helps us to identify and create characters and to write these characters into dialogue and interaction".*

The pracademic continues, *"We have sufficient to help us thematize both your (academic) interests and mine to move the conversation forward"*. I suppose these 6 themes (Fig. 3.18, p.74) do provide plenty of scope. "*We have more than those potentially, you have given us much to think about*" adds the pracademic. *"May I say something?"* asks the student. *"Should I be afraid?"* laughs the pracademic.

The student talks about the *'implication of change'* (Sinclair, 2013, p.6); before I discuss the quote from Adams, Holman-Jones, Ellis (above) I wanted to talk about the implication or *'cost of change'*. I became aware of this whilst studying the RIBA Plan of Work, it led me to valuing the process of design, timing of decision-making; about managing *'data-overload'*. We've generated a lot of data, just from this *'conversation'*. We need to think about this collectively, particularly as you *(pracademic)* move forward with this research. *"Thank you, that's a good point"* says the pracademic.

"Actually, I haven't spoken about how I've used the RIBA Plan of Works in my teaching" says the academic. *"We can come back to it, but you (student) said you wanted to discuss the quote from Adams, Holman-Jones and Ellis"* says the pracademic. Yes, it was thinking about *'thematizing to establish a logic or pattern to the narrative'*, how we can *'explicitly ensure our personal experience is connected to culture'*. But the issue we have is that our own personal experience is situated in a culture we collectively consider *'siloed, fragmented and over-complicated'*; which we could contribute to if not careful.

Thinking about your *(academic)* *'output theory'* idea, we could without realising it; just become artefacts of our current culture, which won't help you *(pracademic)* to re-imagine built environment education. *"That's a great point, how do you suggest moving forward?"* asks the pracademic. Academia and industry see the same thing differently, timing and viewpoint is important; I would like to share some ideas which will help us take stock of where we are at. We've discussed a number of things and we could do with bringing them together, it will help us *'connect-the-dots'* and hopefully start to thematize this *'conversation'* a little better. *"Ok go for it"* replies the pracademic.

Developing a system or model to synergise personal experience and culture

The student continues, throughout Uni I was influenced by architect Sir Norman Foster, who I'm assuming you guys know? He led me to Buckminster Fuller, I've read various books by and about him, becoming interested in the geometry of how I think. I sought to better understand how my degree helped my self-transformation. I could discuss many aspects of Fuller's work, but I'll come straight to Synergetics, not for the faint-hearted. *"You're not wrong, it's hard work: Baldwin (1996, p.68) is possibly better to outline Synergetics"*, says the academic.

Buckminster Fuller (1979, p.135) provides an *'underlying order in randomness'* table (Fig. 3.23), similar to Pangaro's (2019) *'conversations'* (Fig. 3.5, p.55) possibly? Fuller identifies optimal patterns for conceptually thinking about systems or *'events'*; *'most economical relationships between events, or minimum number of inter-connections of all events'*. It's the repeated patterns of 4 and 6 I'm drawn to, evident in our discussion; information derived from both academia *(institutional data)* and industry *(professional body criteria)*. The patterns of 4 events with 6 relationships are *'themes',* for which we can connect personal experience and culture explicitly in some way.

Figure 3.23 – Underlying order of randomness. (Buckminster Fuller 1979, p.135).
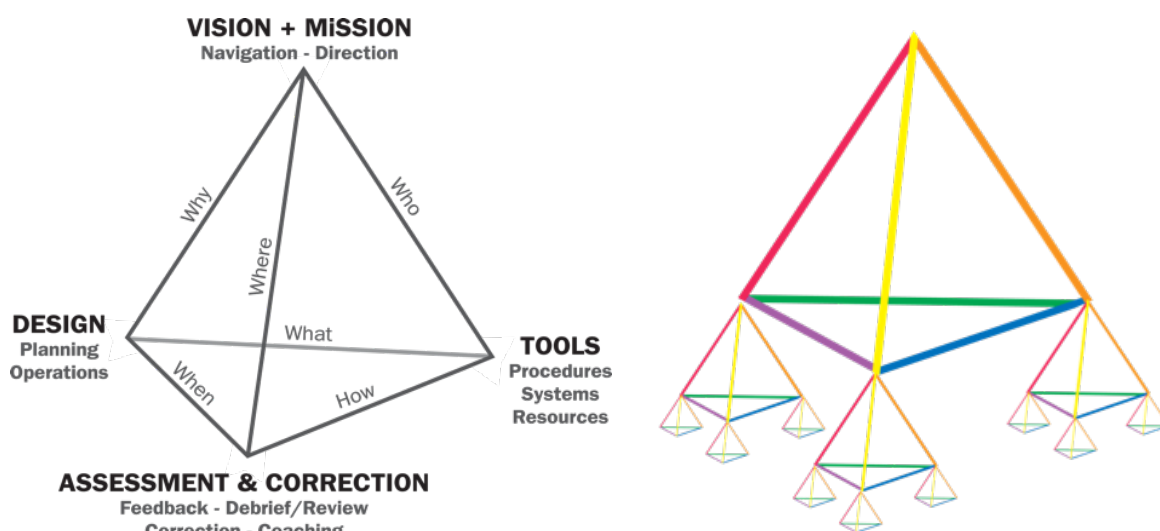
Figure 3.24 – Synergetic Assessment Model; Scalable, Stable, Simple. (Social Synergetics, 2020).

Social Synergetics (2020) provide tetrahedral models reflecting Fuller's work, it may help you *(pracademic)* conceptualise your research (Fig. 3.24). I watched a video on YouTube about Synergetics (Cates, 2015) in which Fuller states:

"a tetrahedron is the minimal structural system in the universe".

"That puts a different spin on things, so we could use 5W & 1H questions and additional words from Fig. 3.2 (p.51)", suggests the pracademic. *"Would the additional words just constrain our thinking?" the academic asks. The pracademic replies, "No, keep them they help focus the 'conversation'. Please continue while I think a little more: How can these models help us?".* Although simplistic, Social Synergetics (2020) state the tetrahedral models in Fig. 3.24 are:

> *"Scalable, stable, and simple, supporting consistent thinking, planning and action as a project builds out into sub-projects and committees".*

"This is probably what was lacking in our transformation project" says the academic. "A good reminder for me as this investigation grows, you (academic) could be right in respect to your transformation project. I suppose the main point here is that in order to re-imagine built environment education, I need to understand how the system works currently. For me particularly this means giving a great deal of attention to my personal experience and the culture I'm in: sorry carry on" says the pracademic.

The models in Fig. 3.24 are like the *'Double Diamond'* model (Fig. 3.3, p.52), conceptually they break down the linearity of a process. *"I think this is important, conceptually this helps me to consider the expansion or contraction of this investigation. So, as we interact with a system, or as I proceed and work through solutions to conduct this research, as it gets bigger it will be harder to control" says the pracademic.*

"You've referred to Social Synergetics (2020) in Fig. 3.24 (p.81), are there better sources we can use? Go directly into Fuller's book?" the academic suggests. We could, but as we've both said it is a hard book to follow if you are not used to it, compounded further by Fuller's own style of communicating or writing. So, I will stick with Social Synergetics (2020) because there's two other things I'd like to add first, Fig. 3.25 highlights internal and external elements: *'12 degrees for freedom'*. It's thinking about *'the explicit connection between personal experience and culture'* that Adams, Holman-Jones, Ellis (2015, p.77) highlight that made me think of this.
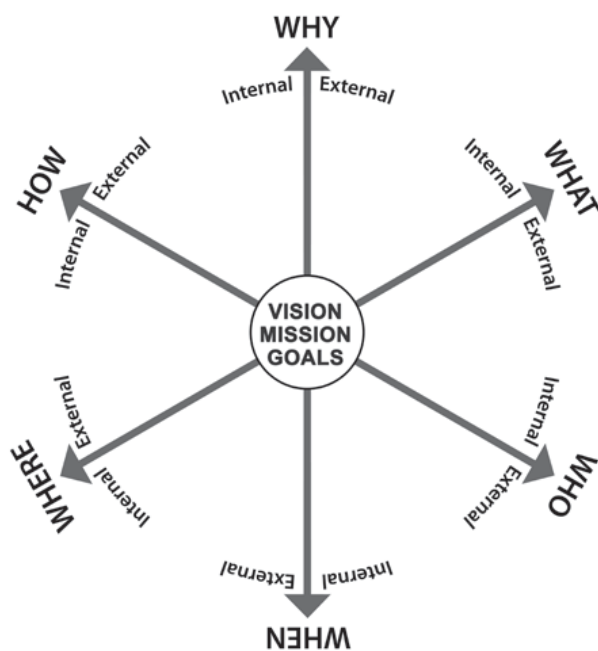
Figure 3.25 – Considering inside/ outside of system for stability. (Social Synergetics, 2020).

To provide a stable system we have to consider both the inside and outside of it. Appreciating our viewpoint changes and the timing of the relationship between academia and industry is important, Its *'precessional'*. Gerber Jr. (p.56, 2001) refers to Fuller to state precession:

> *"Is the integrated effect of bodies in motion on other bodies in motion".*

If one element changes it impacts other elements of the system, possibly losing energy or collapsing. *"So, I have to think about personal experience (Internal) and culture (External) to understand how they impact each other"* says the pracademic.

The academic offers an observation, *"I'm looking at Fig. 3.25, both the models within Fig. 3.24 (p.81) and Fuller's 'underlying order of randomness' table (Fig. 3.23, p.80), along with themes brought together in Fig. 3.17 (p.71). Using the four themes of my transformation project may be more beneficial here, we could attempt to bring something together that may help us all? Certainly me and you (pracademic)"*. *"Ok carry on"* suggests the pracademic. The academic continues, *"Let's pair the four central headings from Fig. 3.17 (p.71) with the first tetrahedral model Social Synergetics (2020) provide on (Fig. 3.24, p.81); what do you think?"*:

- Quadrant D/ Graduate Attributes = Vision + Mission
- Quadrant C/ Curriculum & Assessment = Assessment & Correction
- Quadrant A/ Academic Support = Tools
- Quadrant B/ Learning & Teaching = Design

"They seem clear to me. I think this emphasizes exploring 'Learning & Teaching = Design'; a good place to begin exploring the relationship between theory and practice of built environment education. It's also making me think about the QAA criteria (Fig. 3.17, p.71)" replies the pracademic. The student chips in, "*If I may, while you have been talking, I've combined both the Social Synergetics (2020) models (Fig. 3.24, p.81); interpreting the colour-coding with the 5W & 1H questions based, mapping the colours from the headings at each vertex. What do you think of Fig. 3.26?".*
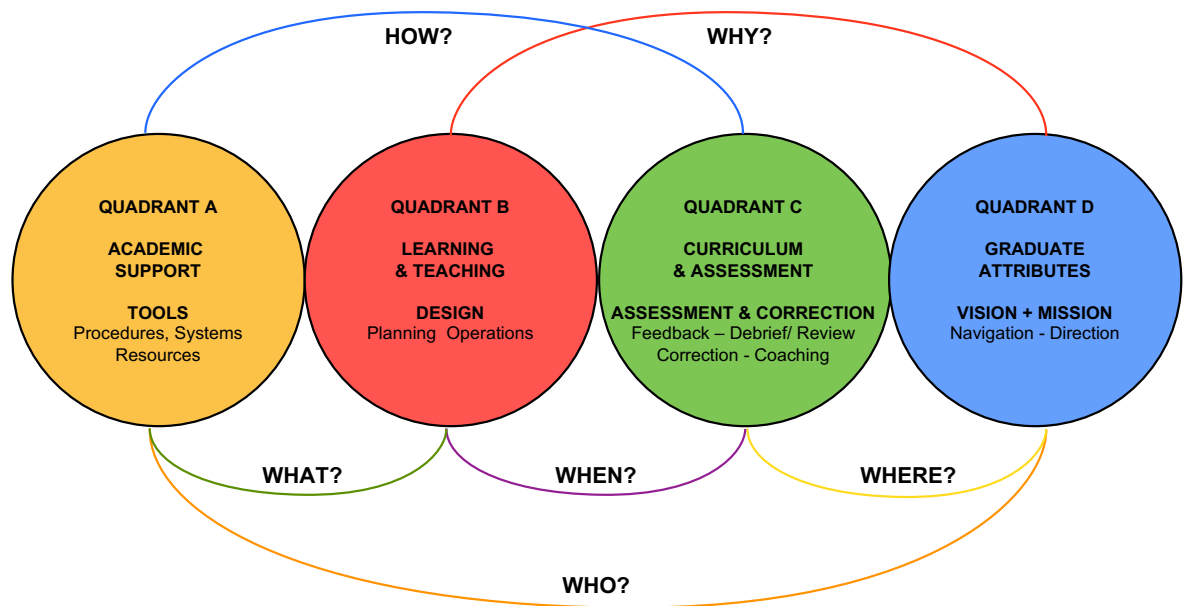
Figure 3.26 – Trafford and Leshem's (2008) 'quadrants' and transformation themes (Fig. 3.17, p.71) with Buckminster Fuller (1970, p.135) 'underlying order of randomness relationships'.

The academic and pracademic digest the student's model (Fig. 3.26). *"Ok I follow you, what would you suggest for the 'relationships' where you have put 5W & 1H questions?"* asks the academic. "*I'd leave them as they are*" suggests the student. *"I'd be inclined to explore these 'events' in the context of built environment education with the six themes derived from the professional body criteria (Fig. 3.18, p.74). 'Internal' (Personal) and 'External' (Professional) Fig. 3.25 (p.82) 'precessional relationships' could be explored further in Fig. 3.26"* the pracademic suggests. *"Can I share something else before we go too far?"*, asks the student. *"Yeah sure"* replies the pracademic.

The student brings up Fig. 3.27 (p.84) on his iPad. I've just put all the wording from the CIC criteria (Fig. 3.21, p.77) and the RIBA criteria (Fig. 3.19, p.74) together in the top wordcloud (Fig. 3.27, p.84), slightly biased by the design emphasis of the RIBA criteria possibly. I've also put the QAA criteria (Fig. 3.17, p.71) in it's own wordcloud, interestingly *'discipline'* has come out as a dominant keyword. *"We touched on this earlier, I find it strange at doctoral level. You've highlighted 'personal' in the top wordcloud, its weird it isn't in the QAA criteria and possibly something to not lose sight of"* suggests the academic.
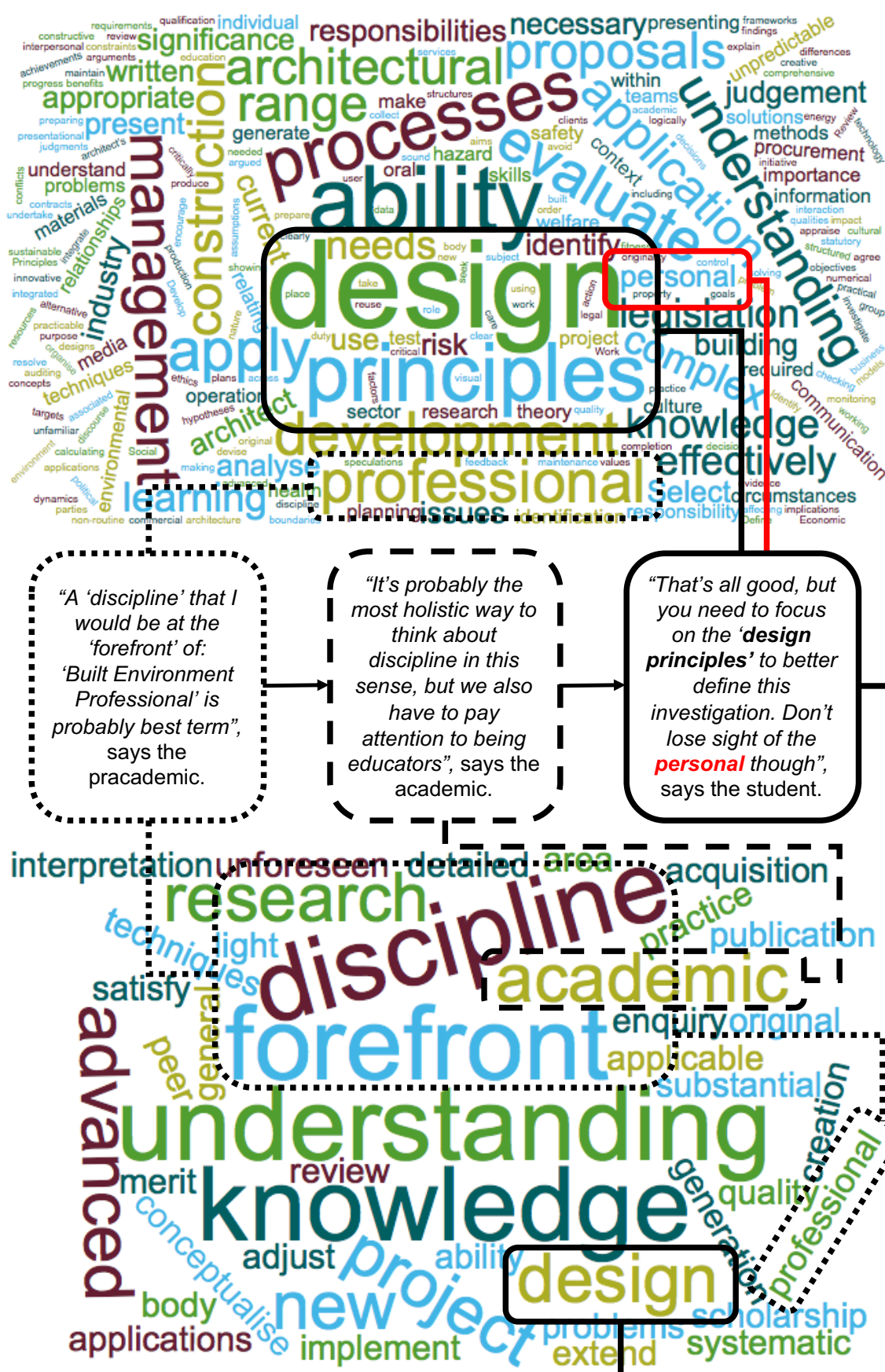
*Figure 3.27 – Wordclouds including CIC, RIBA and QAA criteria keywords.
(Graphic created by author, wordclouds generated through WordCloud, 2020).*

The text within the figure reads:

"A 'discipline' that I would be at the 'forefront' of: 'Built Environment Professional' is probably best term", says the pracademic.

"It's probably the most holistic way to think about discipline in this sense, but we also have to pay attention to being educators", says the academic.

"That's all good, but you need to focus on the 'design principles' to better define this investigation. Don't lose sight of the personal though", says the student.

The pracademic takes some time to reflect for a moment, he begins to talk but is away with his own thoughts at the same time, a little weary. Thank you both for your comments, you *(student)* particularly keep coming up with interesting ways of presenting ideas graphically. Fig. 3.27, (p.84) has really helped me to focus some aspects of my investigation, it's left me a little distracted for a moment but does highlight the need to focus on design, and paying attention to the personal and professional.

Sitting back rubbing his chin with a thoughtful frown, the pracademic looks over the head of the academic towards the ceiling in the distance and flicks back to the research objectives in this investigation (p.11). I'm looking at my research objectives, interpreting them how they correspond with Fig. 3.26 (p.83); I've positioned the *'events'* and the *'relationships'* as you *(academic)* did with to arrive at Fig. 3.28.
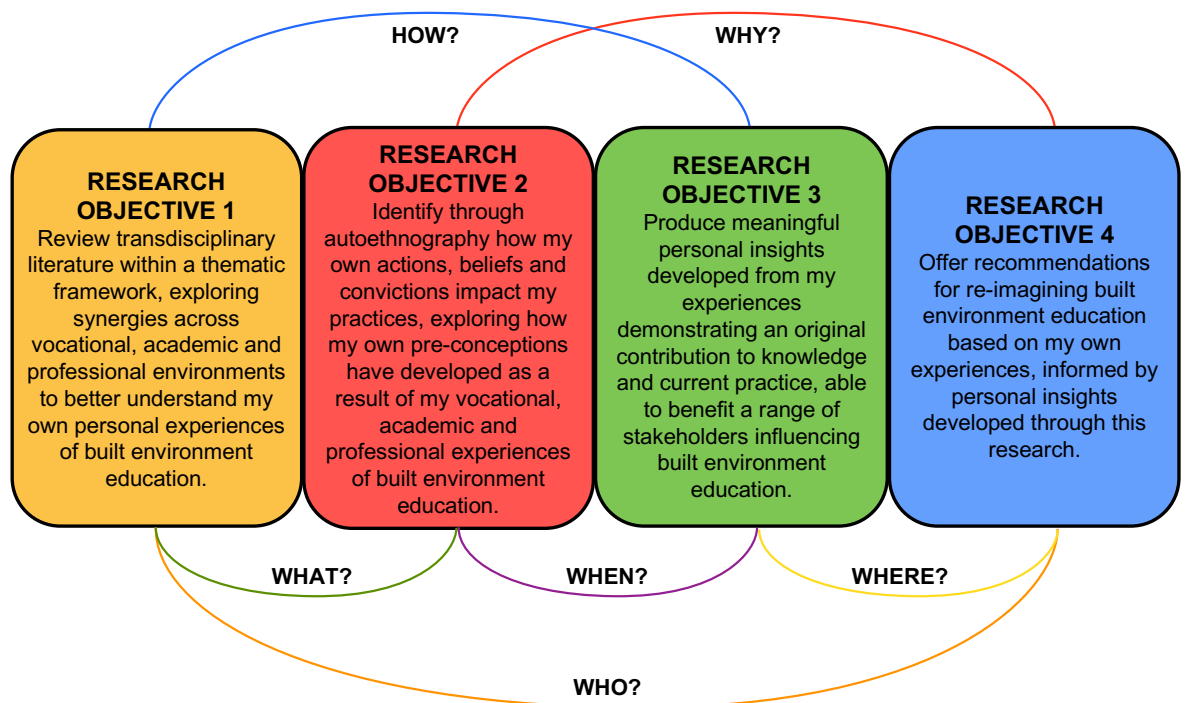
Figure 3.28 – Research Objectives considered with principle of 'relationships'. (By author, informed by Fig. 3.26, p.83: Buckminster Fuller, 1979, p.135) 'underlying order in randomness').

How does 5W and 1H *'relationships'* work in this model, or the tetrahedral models Social Synergetics (2020) provide? *"I'd have to go away and explore Social Synergetics (2020) website again"* replies the student. Ok, I think it's a good time to call it a day, I'm getting a little tired. *"I'd say a beer down Spoons but lockdown kind of kills that idea"* says the student. *"A beer sounds good though"* says the academic. I'm going to take a raincheck for now, however, it would be useful to get back together again though. But thanks guys this has been really useful, some great insights and ideas. I'm just going to take a moment to summarise the main points of our *'conversation',* it will help crystallise things and explore the literature for the next part of my research.

Chapter reflections and insights

This chapter has begun to scratch an *'itch'* covering a range of topics, however, they cannot all be explored in this research. Fig. 3.29 summarises the main topics under their sub-headings, colour-coded to research objectives; topics in grey are not considered an immediate focus in chapter 4, but form part of the *'conversation'* in chapters 5 and 6.
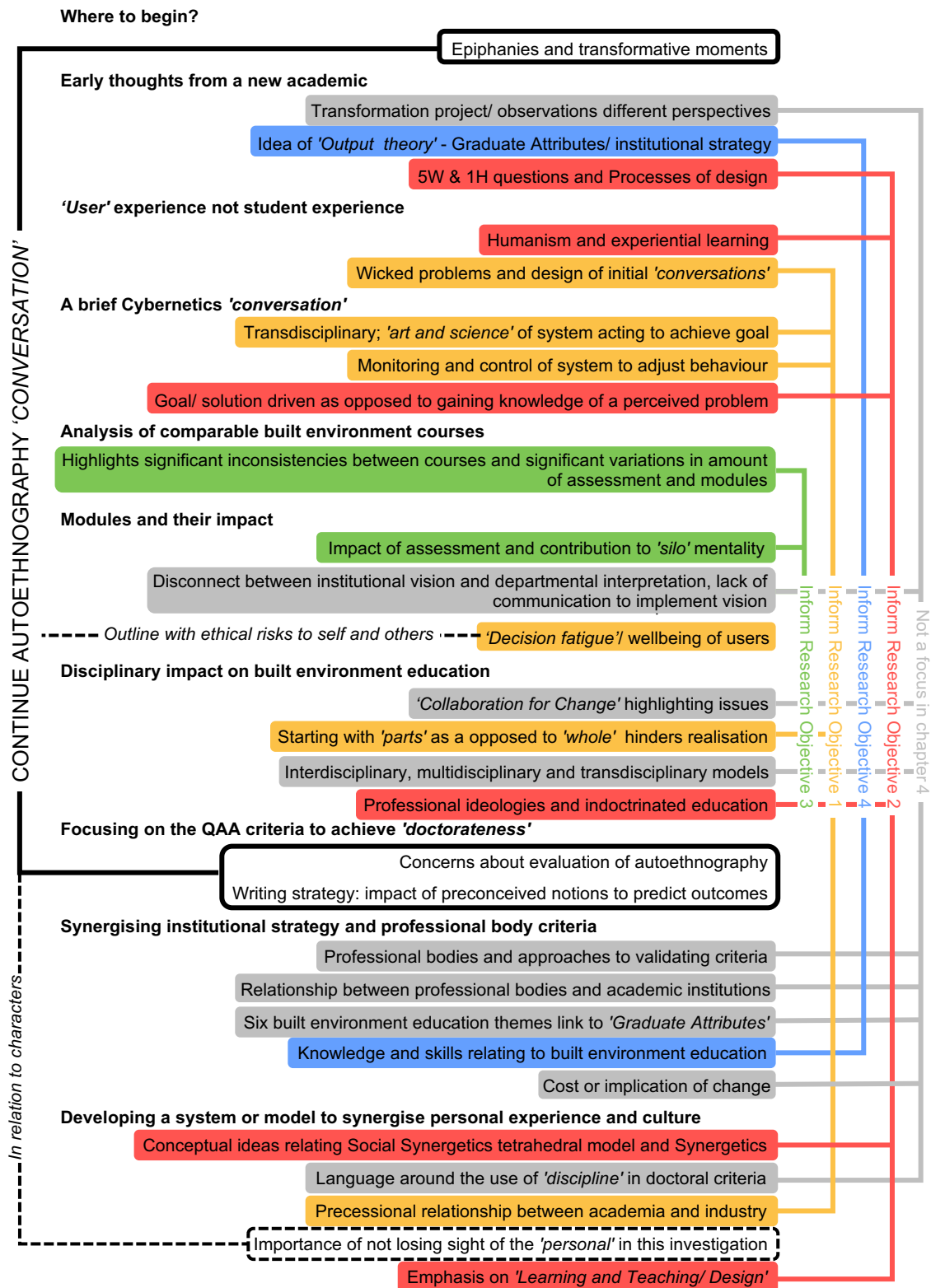
Figure 3.29 – Categorizing topics with Research Objectives to inform chapter 4. (By author).

Paying attention to the *'characters'*, focusing on the reflexive *'conversation'* between them, has brought out conflicting views that have come with a period of rapid self-transformation. But these views are representative of both '*personal experience and culture'* within built environment education; current and longstanding, *'conversations'* that produce meaningful *'insights'* from different perspectives over a relatively small time frame.

From an analysis of similar courses, questions arise of how we can adequately benchmark the sector and how competent graduates are in reality; from this, it could be suggested built environment education is too siloed, over-complicated, specialized and disciplinary. Too much autonomy appears to be given to institutions, by professional bodies to decide on how they decide to meet requirements once validated. Professional bodies themselves could be questioned; what purpose do they serve to justify their influence on built environment education, their data and guidance currently seem difficult to navigate and interpret. It has become evident in this chapter that professional body criteria generally, does not sufficiently consider the learner whilst in the process of learning; potentially filtering through into the design and delivery of learning experiences themselves.

Questions about the design of learning experiences and lack of focus on learners, suggests more defined design principles may be beneficial. Based on the institutional data explored, it appears there is a willingness to improve, but there is a disconnect between institutional vision and departmental interpretation; guidance to implement may be an issue. From a willingness to improve, comes an opportunity to transform how we currently educate future professionals, this chapter has begun to explore how we can re-imagine built environment education. Exploring ways to simplify the process through design, 6 key professional body themes have emerged, graduate attributes providing a link to institutional information.

Within Fig. 3.29 (p.86) five *'conversations'* are outlined, one around autoethnography to a large extent was addressed within chapter 2; however, evaluation of the method with developing my writing is likely in other conversations in chapter 4. Another *'conversation'*, aligned with research objective 1 (RO1), is to explore artefacts and aid *'autoethnographic conversations'* moving towards chapters 5 and 6.

A further *'conversation',* one aligned with RO2, looks to further explore experiential learning models and humanist learning theories. Going beyond my disciplinary boundaries of built environment education into fields such as cybernetics and synergetics highlights how a different perspective can bring a shift in mindset; a shift towards a more goal or solution-driven may pay dividends and inform RO2 further. A *'conversation'* aligned with RO3 (Fig. 3.29, p.86) and assessment may prove more useful to explore in chapters 5 and 6.

The final *'conversation'* is to further develop the idea of *'output theory'*, in orientating my way to RO4 Fig. 3.30 offers a thematic framework to guide other RO's. Codification of RO's within Fig. 3.30 (RO1.1 for example) offers some immediate direction through the literature in chapter 4. Autoethnography at this stage still feels like the right *'tool'*, it's a method that attracts criticism from some within the academic community, with it comes a need to move forward with care; paying attention to the potential pitfalls that this method attracts. Looking to simplify this investigation, chapter 4 informed by the thematic framework in Fig. 3.30 can bring greater clarity and focus; it can help to better direct the story to come from the *'characters'* in chapters 5 and 6.

Thematic framework linking research objectives with codified *topics* from this chapter.

RESEARCH OBJECTIVE 1
Review transdisciplinary literature within a thematic framework, exploring synergies across vocational, academic and professional environments to better understand my own personal experiences of built environment education.

ACADEMIC SUPPORT - TOOLS
Procedures/ Systems /Resources

Wicked problems and design of initial *'conversations'*	**RO1.1**
Transdisciplinary; *'art and science'* of system acting to achieve goal	**RO1.2**
Monitoring and control of system to adjust behaviour	**RO1.3**
'Decision fatigue'/ wellbeing of users *(Outline with ethical risks to self & others)*	**RO1.4**
Starting with *'parts'* as a opposed to *'whole'* hinders realisation	**RO1.5**
Precessional relationship between academia and industry	**RO1.6**

RESEARCH OBJECTIVE 2
Identify through autoethnography how my own actions, beliefs and convictions impact my practices, exploring how my own pre-conceptions have developed as a result of my vocational, academic and professional experiences of built environment education.

LEARNING & TEACHING – DESIGN
Planning/ Operations

5W & 1H questions and Processes of design	**RO2.1**
Humanism and experiential learning	**RO2.2**
Goal/ solution driven as opposed to gaining knowledge of a perceived problem	**RO2.3**
Professional ideologies and indoctrinated education	**RO2.4**
Conceptual ideas relating Social Synergetics tetrahedral model and Synergetics	**RO2.5**
Emphasis on *'Learning and Teaching/ Design'*	**RO2.6**

RESEARCH OBJECTIVE 3
Produce meaningful personal insights developed from my experiences demonstrating an original contribution to knowledge and current practice, able to benefit a range of stakeholders influencing built environment education.

CURRICULUM & ASSESSMENT - ASSSESSMENT & CORRECTION
Feedback – Debrief/Review
Correction - Coaching

Highlights significant inconsistencies between courses and significant variations in amount of assessment and modules	**RO3.1**
Impact of assessment and contribution to *'silo'* mentality	**RO3.2**

RESEARCH OBJECTIVE 4
Offer recommendations for re-imagining built environment education based on my own experiences, informed by personal insights developed through this research.

GRADUATE ATTRIBUTES – VISION + MISSION
Navigation - Direction

Idea of *'Output theory'* - Graduate Attributes/ institutional strategy	**RO4.1**
Knowledge and skills relating to built environment education	**RO4.2**

Figure 3.30 – Thematic framework to inform 'conversations' in chapter 3. (By author).

Chapter 4 – Listening to the Literature

This chapter provides a more focused review of transdisciplinary literature informed by a thematic framework derived from chapter 3 it offers some direction whilst still allowing space for the design of this investigation to develop. By unpicking chapter 3, this chapter develops upon the methodological discussion in chapter 2 to help mobilise the *'story'* of characters in autoethnographic chapters 5 and 6.

The *'ideal'* is to be systematic, inferring linearity, but themes from chapter 3 (Fig. 3.30, p.88) are interwoven into a *'conversation'* that seeks to better understand the construction of artefacts, experiential learning models and humanist learning theories; nuanced with exploring more scientific methods that suit my skillset. This chapter seeks to identify *'tools'* to help unpack my experiences of built environment education in chapters 5 and 6.

How research objectives support my contribution to knowledge and practice

Research objectives (RO) 1, 2 and 3 informs my contribution to practice (RO4), which is not my immediate focus; my focus is producing *'insights'* (RO3). RO's 1, 2 and 3 (Fig. 4.1) are informed by chapter 3, reflecting a period of personal experience observing the professional landscape, leading to a thematic framework (Fig. 3.30, p.88). A personal emphasis now drives a review of literature (RO1); to develop knowledge and support autoethnography itself (RO2); reflexively unpack my experiences of built environment education (RO3); to deliver insights and offer recommendations (RO4) to make both my contribution to knowledge and professional practice.

CONTRIBUTION TO KNOWLEDGE

CONTRIBUTION TO PRACTICE

RESEARCH OBJECTIVE 1 (RO1)
Review transdisciplinary literature within a thematic framework, exploring synergies across vocational, academic and professional environments to better understand my own personal experiences of built environment education.

RESEARCH OBJECTIVE 2 (RO2)
Identify through autoethnography how my own actions, beliefs and convictions impact my practices, exploring how my own pre-conceptions have developed as a result of my vocational, academic and professional experiences of built environment education.

RESEARCH OBJECTIVE 3 (RO3)
Produce meaningful personal insights developed from my experiences demonstrating an original contribution to knowledge and current practice, able to benefit a range of stakeholders influencing built environment education.

=

RESEARCH OBJECTIVE 4 (RO4)
Offer recommendations for re-imagining built environment education based on my own experiences, informed by personal insights developed through this research.

Figure 4.1 – Focusing the review of literature to ensure Research Objectives 1, 2 and 3 make contribution to knowledge, to inform RO4 making contribution to practice. (By author).

RO4 is aspirational, it is informed by RO's 1, 2 and 3. RO1 with RO2 is the immediate focus as this chapter looks to provide a greater focus for chapters 5 and 6; RO4 itself is informed by all other RO's, but it directs all the other RO's to make a *'contribution to knowledge'* through my personal insights (Fig. 4.1).

Initially unsure how to structure and conceptualise my own story, I was curious as to how doctoral theses use the method and explore the literature of others; I was mainly interested in built environment topics, possible links to education, DProf's and the structuring of theses themselves. An EThoS search confirmed I am in a minority: bad thing for gaining a better insight of how to approach this; good thing for making an *'original'* contribution to knowledge and practice with autoethnography.

My initial EThoS search for *'autoethnography'* identifies 189 theses, *'autoethnography built environment'* offers no results. *'Autoethnography construction'* (44 theses), most recent Jones (2019) and Grosse (2018), both PhD's but industry focused. *'Autoethnography professional doctorate'* (10 theses), varying approaches across DProf (EdD, etc.), none relate directly to my topic. Lawson (2017) and Dilworth (2008), both different in approach, offer something to inform the design of this thesis in different ways. Dilworth (2008) informed the idea of inserting a chapter early in this thesis, to inform the review of literature. Lawson (2017) focuses on transformative reflection and reflexivity on work-based learning, the thesis structure offers an *'integrative doctoral report'* with an extensive portfolio to support it. It relates primarily to police investigation but offers ideas to explore with experiential and work-based learning models, there is also a *'pracademic'* connection and his own transition from practice to education.

Exploring other doctoral theses that include autoethnography it appears it is more widely used in healthcare and education, with significant variations in how it is presented both in structure and research quality; some brought a raised eyebrow with the latter. Search results surprised me, I anticipated a higher return for a stereotypically *'practice-led'* product showcasing personal experiences and professional practices of researchers. It could be others used similar methods to autoethnography to achieve the same thing? Or that students are discouraged from writing about personal experiences for ethical reasons (Etherington, 2004, p.141); or for fear of how it could impact careers (Adams, Holman-Jones and Ellis (2015, p.7), particularly if treading an academic path; perhaps through having many forms of ethnography (Creswell and Poth, 2018, p.92), emphasizing *'self'* through autoethnography was just not necessary.

Reading through autoethnographic DProfs what I was looking for was the language used, to consider my own positionality as a *'researching professional'*. However, autoethnography offers considerable flexibility, it is in the hands of the individual to mould the method to suit their own story; my journey continues as to how best to develop my own and learn from chapter 3, to work through themes iteratively and explicitly use my research objectives to help develop the *'conversation'* in chapters 5 and 6.

Fig. 3.30 (p.88) provides a thematic framework informing this chapter; however, thematizing research is challenging. Adams, Holman-Jones and Ellis (2015, p.25) suggest the design of autoethnographic projects are unlike scientific projects, that *"the nuance and complexity of identities, lives, relationships, and experiences do not easily or neatly translate to an experiment, survey, or list of interview questions"*. However, I mainly think like a scientist, for this reason the advice of Chang (2008, p.116) *"to manage the data as it is being collected, immediately label, sort and group it by structural and topical categories"*; Fig. 3.30 (p.88) is helpful, but Fig. 4.2 helps me more conceptually.

Fig. 4.2 utilises the iterative *'Double Diamond'* model to serve as a reminder that some of the best *'tools'* come from not *'re-inventing the wheel'*, it helps me to better visualise this research. Fulton et al (2013, p.25) state that as a *"researching professional my actions and decision-making processes are not bound by the traditional ways of doing things"*. I respect tradition but do not like being *'bound'*, having a degree of flexibility in how the story is told through autoethnography ensures congruence with the requirements of my professional doctorate and me personally.
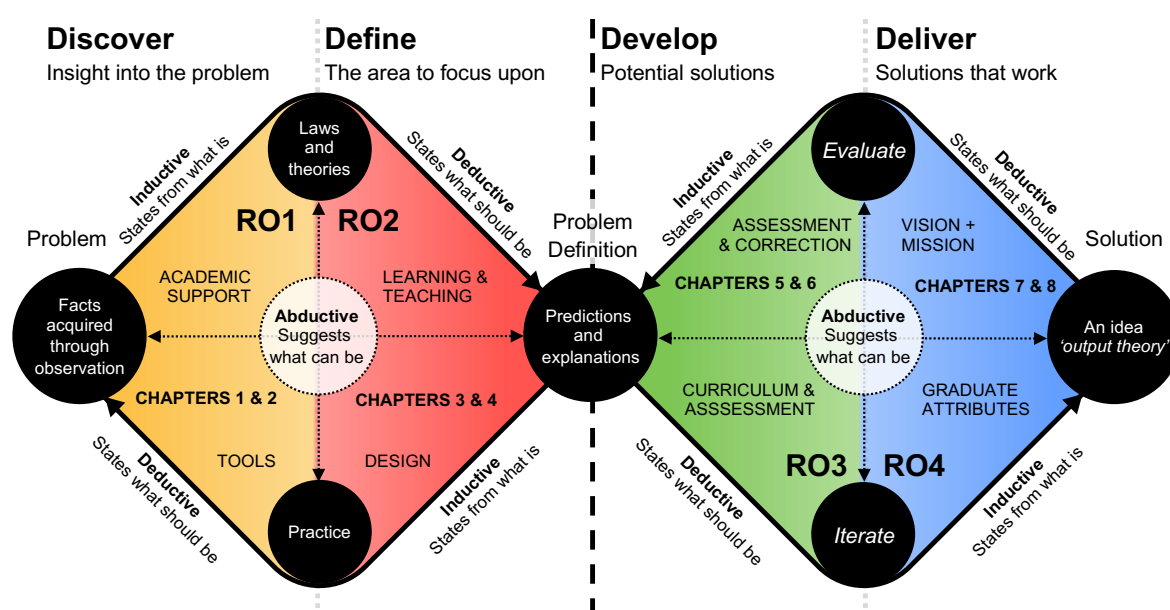
Figure 4.2 – Appreciating the iterative research process of this thesis.
(Adapted by author from Design Council, 2017).

Fig. 4.2 highlights that by providing the autobiographical account in chapter 3, it both offers a greater insight into *'why'*, whilst giving attention to the process of designing the thesis moving forward: *'how'*. Although RO3 is placed within one area of Fig. 4.2, chapter 3 offers *'insights'* contributing to this objective, to help better focus the review of literature in this chapter. This brings a particular focus on the relationship between RO1 and RO2, to better define areas for character *'conversations'* in chapters 5 and 6; to help develop insights for RO3 and to realise the aspirational RO4.

Continuing the Cybernetics and Synergetics *'conversation'*

To move forward and learn from chapter 3 and simplify things I am thinking of the *'Black Box'* as my brain, to help conceptualise and inform my use of autoethnography. Petrick (2019) refers to Walter (1953) in the context of discussing education:

> *"Walter emphasized the idea that every child black box is unique and that one of the difficulties with formal education was that no one input method would produce the desired output for every child."*

Every adult black box is unique!', making the casing around the *'box'* all the more important, especially in how we learn. We all learn differently, my use of autoethnography is orientated by my skills and experience; in turn it guides me. This is what brings me back to Cybernetics and Synergetics, to the *'Fuller-inspired'* tetrahedral model discussed in chapter 3 (Fig. 3.24, p.81); I have just flipped Fig. 4.3 to aid comparison with Fig. 2.4 (p.19).

With Fig. 4.3 I am thinking how to systematise, *'conceptualise'* and '*explore the discerning patterns of my cultural experience'* (Ellis, Adams and Bochner, 2011) in built environment education. Fig. 4.3 connects my *'researcher self'* and my *'subject self'*; a *'tool'* to help me both continue through the literature in this chapter and help characters converse in later chapters. As a visual thinker It helps me to mobilise my thinking, to communicate this thinking to you at different times.
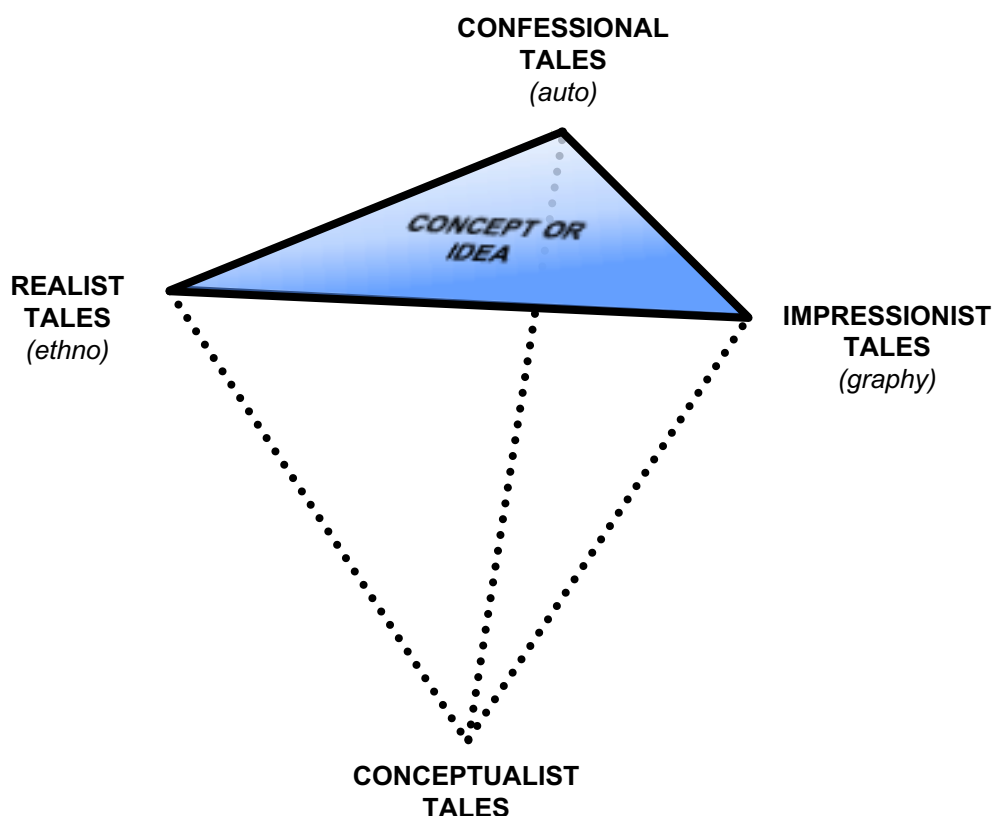

Figure 4.3 – Conceptualising my own autoethnographic story based on Fig. 2.4 (p.19) and fusing it with Social Synergetics (2020) model (by author).

Re-visiting Cybernetics and Synergetics is to help mould autoethnography to my current skillset; Cybernetics offers versatility through *"transdisciplinary inquiry"* (Chapman, 2019), it has *"antidisciplinary"* qualities (Pickering, 2013, p.210); an *'ether like'* appeal. Rid (2016) provides an engaging account of Cybernetics stepping into new territory; Norbert Wiener accredited with naming it in the 1940s. Rid (2016, p.47) refers to Wiener to outline three core ideas; *'control, feedback and a tight relationship between humans and machines'*.

The *'core ideals'* of autoethnography (p.7) are in mind, but the core ideas Rid (2016, p.47) outlines offer more immediate value to me at this stage. Rid (2016, p.49) highlights that control and feedback can be *'abstract, technical, and hard to grasp',* I will come back to feedback in the cybernetic sense in a moment. I want to focus on *'control'* for now because it informs thinking around Fig. 4.3 (p.92), developing a writing strategy without influencing content (Chang, 2008, p.67). Rid (2016, p.48) refers to Wiener to state:

> *"Control means that a system can interact with its environment and shape it, at least to a degree. Environmental data are fed into a system through 'input', and the system affects its environment through 'output'"*

As a *'system'* I can take data from my environment and shape it, to offer an *'output'* to positively benefit built environment education. Chapter 3 *(feedback)* delivered *'insights'* that informs this chapter, but to meet the *'core ideals'* of autoethnography that Adams, Holman-Jones and Ellis (2015, p.25) outline, this research needs to go further to support the story to come through the characters.

Wiener (2013, p.97) suggests *"the simplest control systems are linear"*; linearity feels like the stuff of dreams, this thesis may read linearly but it is hard work stitching this together. Rid (2016, p.160) highlights Wiener's disdain for ideas associated with *"wholism"*: synergy; to be aware of charlatans and amateurs, *'warning against temptations of pseudoscience'*. In referring to Wiener, Rid (2016, p.160) states:

> *"The notion that a system could be understood only as a whole system, as an entity that is more than the sum of its parts. That, to him, was the worst kind of false science."*

I would need to explore Cybernetics further to know if it is a *'pseudoscience'* itself, but I agree with Wiener to some extent with synergy. If only looking from outside the system *(culture)*, it is important to understand synergy comes as a result of all the *'parts'* within a system; from exploring the *'mechanics'* of my educational experiences. Based on *'feedback'* (chapter 3) I question if a range of *'users'* appreciate the *'mechanics'* and how they each impact the learning environment itself; myself included. Importantly, I do not want to appear amateurish or come across as a *'charlatan'*, but in trying to conceptualise this research I can also look to better understand how I have learnt at different times.

Rid (2016, p.49) suggests *'feedback tends to oppose what a system is already doing'*: negative feedback. Wiener (2013, p.97) states *'negative feedback helps to stabilize a position'*, or a *'desired state'* as Rid (2016, p.49) puts it. Wiener (2013, p.97) talks about negative feedback as ways to stabilize temperature and velocity, controlling the pace of my own journey. As my knowledge and understanding develops positive feedback brings reflection, *'insights'* come from having more awareness of my experience; to then better reflexively evaluate it through autoethnography, bringing me to a *'conversation'* in chapter 3 and Synergetics. The Buckminster Fuller Institute (BFI, 2020) states Synergetics is a;

> *"system of holistic thinking: it involves geometric modelling, exploring inter-relationships in the facts of experience and the process of thinking".*

In exploring Buckminster Fuller's work further, particularly synergetics comes some visual *'tools'* to help my thinking. Fuller (1979, p.440) refers to a triangle as an *'energy event' (feedback),* one to be thought of as a spiral (Fig. 4.4), a different perspective of Fig. 3.24 (p.81); the colour-coding and 5W & 1H questions outlined in chapter 3. A positive *'energy event'* (Fig. 4.4) covers*, **'Why/Reaction', 'What/ Action'** and '**How/ Resultant'** directs **'Who, Where** and **When'**; a framework to orientate my use of autoethnography in chapters 5 and 6.
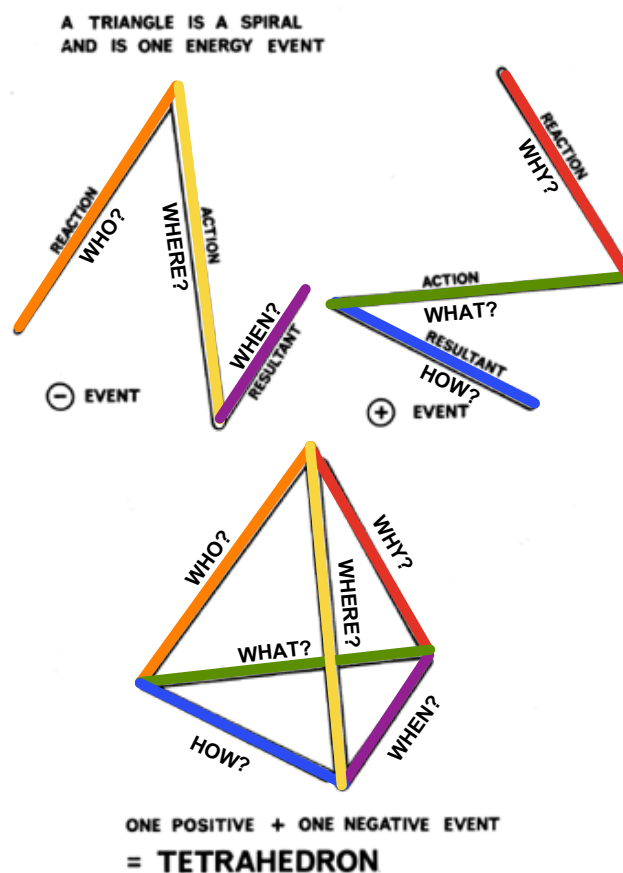
Figure 4.4 – Positive/ negative 'energy events'. (Base image: Buckminster Fuller, 1979, p.440. Colour-coding applied by author from Fig. 3.24, p.81).

Fig. 4.5 places a focus on '*What', 'How'*, and *'When'*. *'Learning & Teaching – Design'* needs further attention as we progress, bringing the relationship between RO1 and RO2 into focus: *'What'* is the focus? It is the *'characters'*. Divergent '*What'* and *'How'* questions <u>from</u> RO1 need controlling; *'When'* is important, it controls RO1 and connects RO2 to RO3. Interestingly, Fig. 4.5 suggests that RO1, 2 and 3 can deliver the all-important original *'contribution to knowledge'* (Fig. 4.1, p.89), that just by asking '*What', 'How'*, and *'When'* questions we have the *'idea or concept'* of the recommendations (RO4); *'not likely!'* This may inform how recommendations are framed, but the most important thing is RO's 1,2 and 3 need RO4; for RO4 itself to be realised.
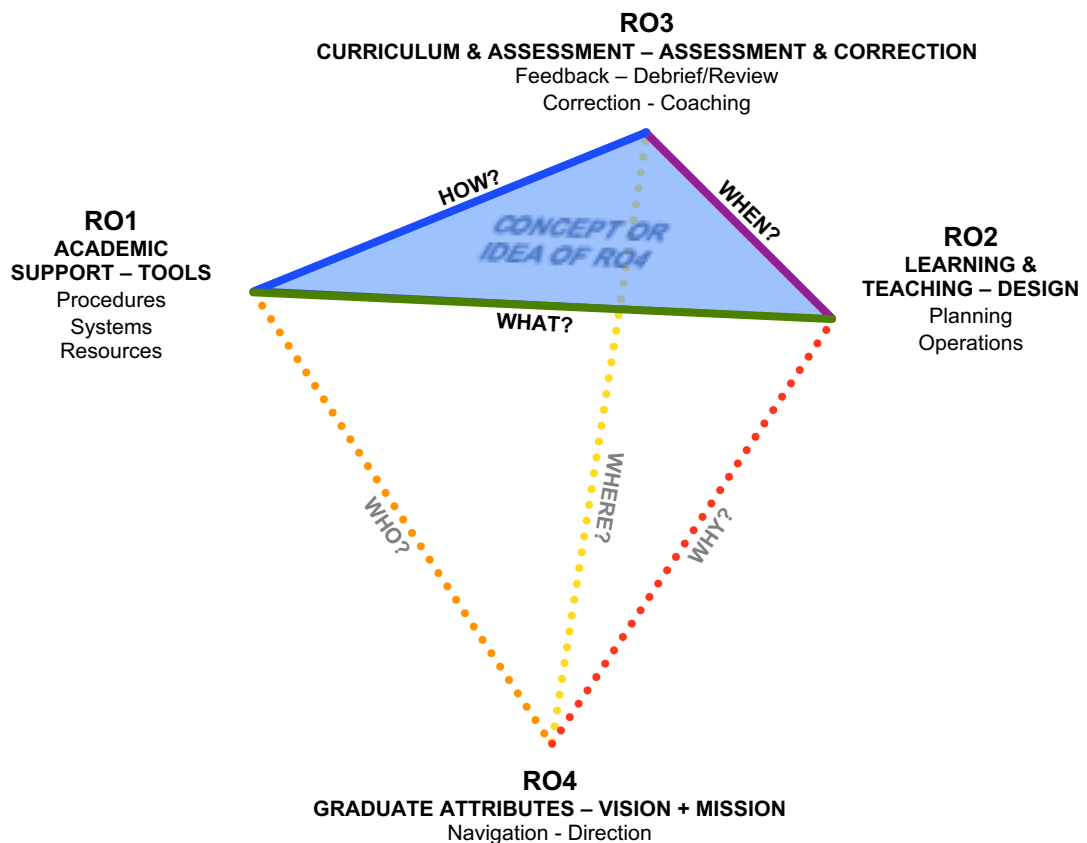
Figure 4.5 – Emphasis on RO's 1, 2 and 3 to provide concept or idea of RO4. (By author, informed by Social Synergetics, 2020).

Walshaw (2012, p.41) suggests *'a review should bring various threads together, continues throughout the doctoral study and that there is never an end to a literature review'*. Taking this literally means keeping sight of *'various threads'* to control the *'confessional, realist and impressionist tales'* (Fig. 4.3, p.92) as they unfold. I could triangulate and over theorise about Fig. 4.5, however, the important point to remember is we only have a *'concept or idea of RO4'* at this stage, but a system to realise all RO's. Wellington (2015, p.68) suggests thinking of a literature review as a story, logical for an autoethnography; a story *'where you are in control of the plot and the unfolding arguments that you wish to put forward'*, RO1 is important here with a focus on *'tools'*.

Fig. 4.6 shows that by considering the tetrahedral model as two spiral-triangle *'energy events'*, positive and negative, we have a system where each *'energy event'* connects to RO's 1, 2, 3 and 4 helping better realise RO4 itself: synergy brings a greater realisation of all RO's *(faces opposite their respective RO)*. With a greater understanding of systems, and procedures to some extent, RO1 informs the three other RO's, but RO1 itself needs to be further informed (Fig. 4.6). I interpret these *'energy events'* as negative – personal and positive – professional, the *'positive' **(Why, What, How)*** guides the *'negative' **(Who, Where, When)***; the story of the characters. To unpack my personal experiences of built environment education, I need to focus on the ***'Why, What, How'*** of autoethnography.

RO3
CURRICULUM & ASSESSMENT – ASSESSMENT & CORRECTION
Feedback – Debrief/Review
Correction - Coaching

HOW? (RESULTANT)

WHEN? (RESULTANT)

REALISATION OF RO4

RO1
ACADEMIC SUPPORT – TOOLS
Procedures
Systems
Resources

WHAT? (ACTION)

RO2
LEARNING & TEACHING – DESIGN
Planning
Operations

WHO? (REACTION)

WHERE? (ACTION)

WHY? (REACTION)

NEGATIVE EVENT (PERSONAL)

POSITIVE EVENT (PROFESSIONAL)

RO4
GRADUATE ATTRIBUTES – VISION + MISSION
Navigation - Direction

Figure 4.6 – Emphasis on RO's 1, 2, 3 and 4 to realise synergy through spiral event triangulation. (By author, informed by Social Synergetics, 2020).

Although triangulation is not typically applicable to autoethnography, Fig. 4.6 triangulates 5W & 1H *'relationships'* in a creative way; not only can they depict the beginning *(reaction)*, middle *(action)* and end *(resultant)* of a story, they can be inter-related to form a bigger story or chapter. Fig. 4.6 offers a means to systematise my RO's, a way to conceptualise and focus the autoethnographic chapters 5 and 6. Referring back to Fig. 4.3 (p.92) briefly, it is through a conceptualist approach that I am fusing together the realist, confessional and impressionist tales of my experiences within built environment education. Fig. 4.6 offers a framework for the narrative, without influencing the story itself; to focus my contribution and perspectives of the characters themselves.

In danger of being too *'solipsistic'* (Etherington, 2003, p.141), *'narcissistic or self-indulgent'* (Chang, 2008, p.51), it is in pursuit of tackling the *'non-analytic, no theory, no concepts, not scientific'* criticisms Denzin (2014, p.69) highlights which captures my immediate attention. Even before using autoethnography, I was curious how we validate research; I followed a similar path to Hamood (2016):

> *"Trying to predict what questions I may be asked, or from which angles I may be challenged in both the feedback from my more immediate assignments and chapters right through to my viva voce in the final stages."*

Trafford and Leshem (2008, p.37) provide *'good/ poor viva models'*, I am not looking to find fault in them; I will refer to them again later in the chapter to outline how they help inform my analysis of experiential learning models. In systematising 5W & 1H questions I began to explore optimal *'question patterns'*, in doing so I intuitively overlaid Fig. 4.6 (p.96) over Trafford and Leshem's (2008) *'good/ poor'* viva models (Fig. 4.7), doing so emphasizes the importance of *'spiral events'* to triangulate synergy.
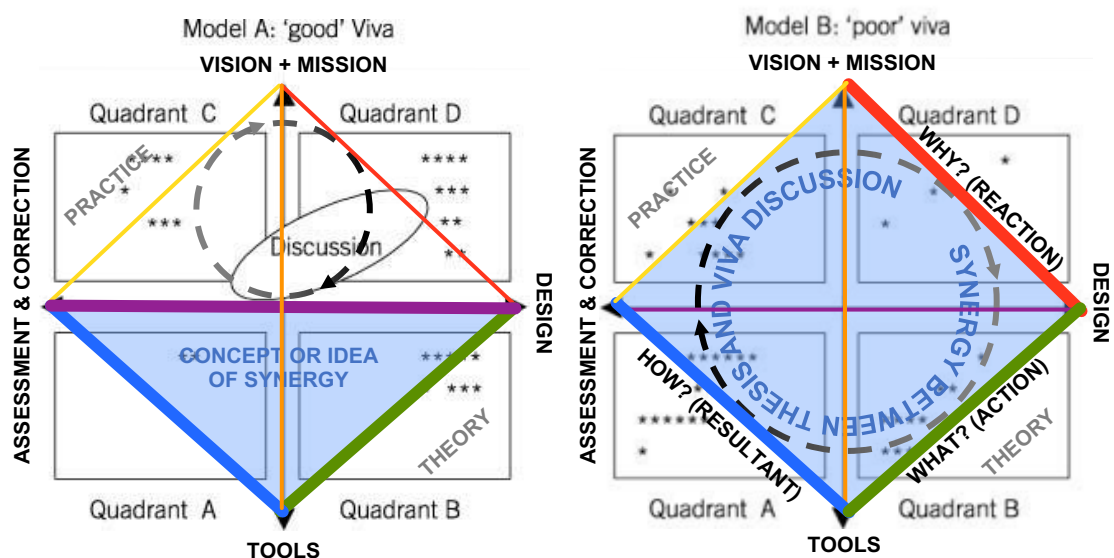
Figure 4.7 – Overlaying Fig. 4.6 (p.96) over Trafford and Leshem's (2008, p.37) 'quadrants model of a good and poor vivas' to appreciate 'spiral events' triangulation. (By author).

The *'good'* viva model in Fig. 4.7 only offers a *'concept or idea'* outside of a viva discussion, with the discussion only in quadrants C and D it is not fully discussing the whole thesis in theory. It could be said the *'good'* viva is not fully serving its purpose, examiners may be academics more attuned to the sort of topics that quadrants A and B cover; it is likely this *'good'* model is for PhD's rather than DProf's. In pursuing optimal *'question patterns'*, which is futile really, it led to discovering *'pairings'* between *'quadrants'*; however, it led to a greater interest in the embedded knowledge within experiential models I have experienced in built environment education. Fig. 4.6 (p.96) has proved itself to be a useful template in analysing Fig. 4.7, a useful *'tool'* to develop my thinking.

I want to be clear about triangulating 5W & 1H *'relationships'*, Fig. 4.8 offers the *'concept'* or *'idea'*, not necessarily the realisation of all my RO's and associated themes. For me this means struggling to *'connect-the-dots'*; research difficult to control, overly complex, hard to follow, disjointed and lacklustre: a limitation with triangulation in my view.
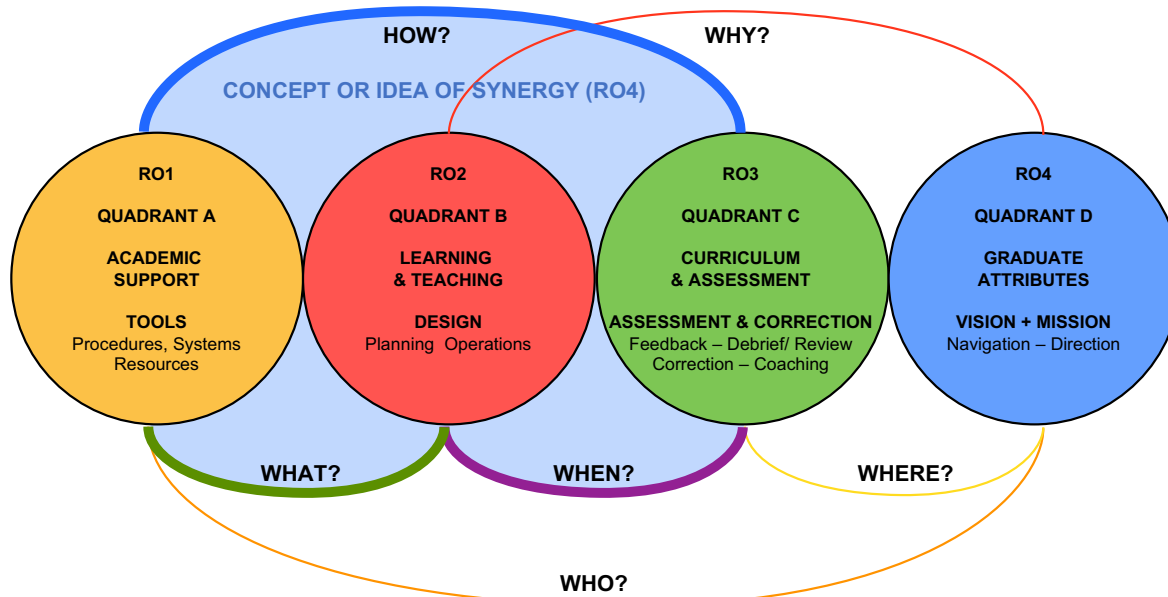
Figure 4.8 – Concept or idea of synergy by only triangulating as Fig. 4.5 (p.95). (By author, informed by Fig. 3.23 (p.80) and Fig. 3.26, p.83).

RO4 directs this investigation, a *'point of entry'* (Fig. 4.9); **'Why? / How?'** is my research question. Between RO's 2 and 3 there is a precessional relationship between theory and practice to appreciate (p.82); my experiences and reasoning informs my use of theory. What Fig. 4.9 brings into focus is **'Where?, Who?** and **'When?'**, I interpret this as mobilising my experience and analysing the artefacts within my built environment education.
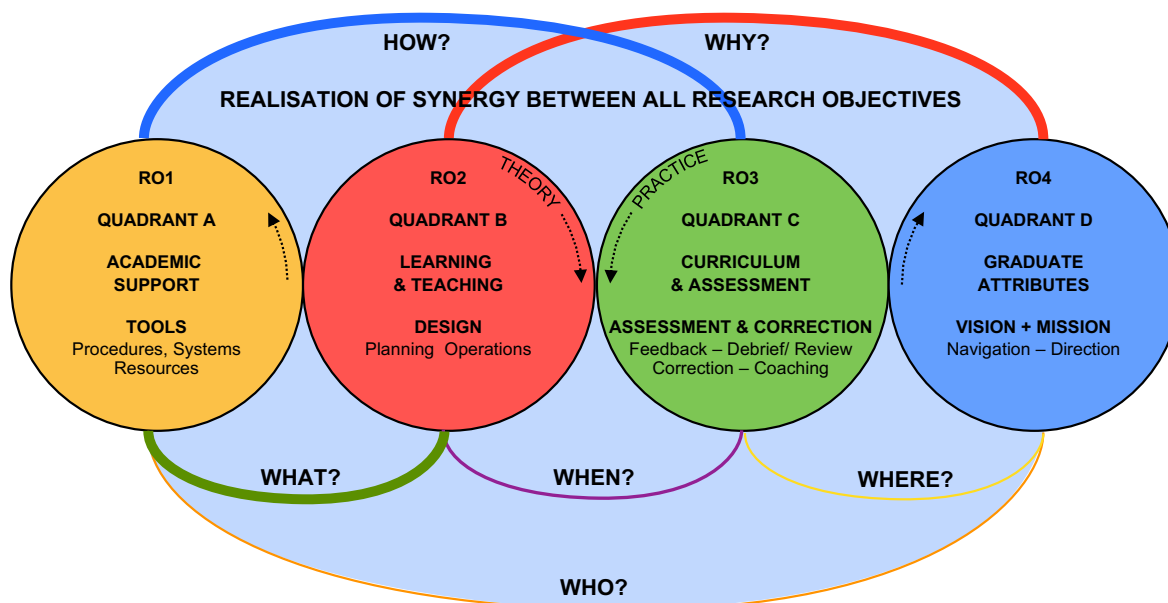
Figure 4.9 – The precessional relationship of theory and practice. (By author).

We collect rich sources of memory data and material in various ways as we compose our lives (Clandinin and Connelly, 2000, p.114). Muncey (2005, p.75) inspires inclusion of my school reports in chapters 1 and 5, using her own to discuss artefacts; I have collected all different types of artefacts over 30 years. Chang (2008, p.107) states artefacts are a *"valuable data collection technique in autoethnographic study"*. Both construction and education offer a range of data *(artefacts)*, that can be fused with my own experiences; the purpose of chapter 3 was to provide insights and be congruent with my doctoral journey: '*an artefact'*. By developing a suitable artefact(s) I can do two things; firstly, provide a focus for the characters, to discuss and contribute autoethnographically to realise RO's 1-3; and secondly, aid the development of an artefact that informs recommendations to realise RO4 and re-imagine built environment education.

O'Riordan (2014) in proposing autoethnography in Information Systems Research states, *"autoethnographer's need to devise strategies from the start to cope with data that can come in various ways"*; Connelly and Clandinin (2000) outline techniques:

1. *Using visual tools like free drawings*
2. *Inventorying people, artefacts, activities, proverbs*
3. *Chronicling the autoethnographer's daily life*
4. *Reading and responding to other autoethnographies*
5. *Collecting other field texts such as stories, personal journals, letters, conversations, interviews, documents, photographs, memory boxes and life experiences.*

Artefacts can facilitate understanding of the culture within built environment education, for both those inside and outside of it. Chang (2008, p.80), states; *"artefacts are ubiquitous in all levels and periods of culture"*. The *"thick description of a culture"* that autoethnography seeks to create, does so *'inductively through feelings, stories, and happenings – as evidenced in field notes, interviews, and/or artifacts to explore discerning patterns of cultural experience'* (Ellis, Adams and Bochner, 2011).

Johannesson and Perjons (2014, p.3) define an artefact as *"an object made by humans with the intention that it be used to address a practical problem"*, offering an architect's plan for a building as an example. Simon (1996, p.3) states artefacts are *"adapted to human goals and purposes"*; a cycle of change between aims and artefacts. My aim is to design an artefact to support the *'conversation'* and myself as an *'artefact'*. To realise my *'purpose or goal, I need to further consider the character of the artefact, and its performance within its environment'* (Simon, 1996, p.5), reinforcing the importance of being explicit reflexively about my positionality as a *"self-as-researcher"* and *"self-as-subject"* (Throne, 2019, p.28), paying attention to myself in my environment(s).

Herbert Simon's *'The Sciences of the Artificial'* is a seminal book for describing objects and phenomena – *'artefacts'*, objects that come from human intervention in the natural world. Dresch et al (2015, p.106) refer to Simon and provide Fig. 4.10 to discuss the construction and application of artefacts and state:

> *"The fulfilment of purpose or adaptation to a goal involves relation among three terms: the purpose or goal, the character of the artifact, and the environment in which the artifact performs".*
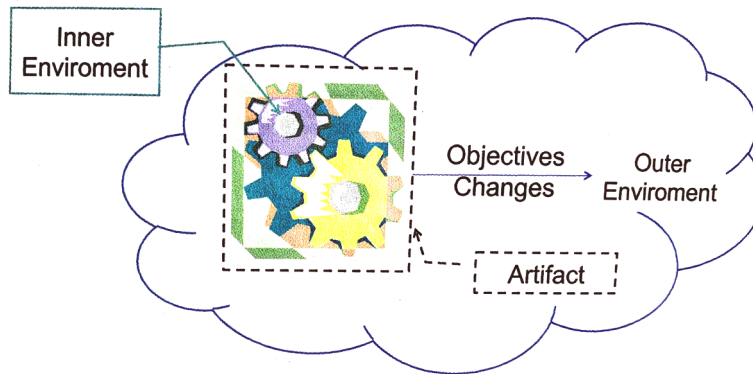
Figure 4.10 – Characterization of an artifact, Dresch et al (2015, p.106).

Both Johannesson and Perjons (2014, p.4) and Dresch et al (2015, p.106), outline that artefacts have an *'inside'*, an *'outside'* and an *'interface'* between them; Johannesson and Perjons' (2014) description is easier to understand with Fig. 4.11 that they provide.

Exploring more scientific sources like Design Science, which focuses on the *'study and creation of artefacts as they are developed'* (Johannesson and Perjons (2014, p.7), is for two reasons: my connection with it as the researcher; and exploring synergies between autoethnography and scientific methods. My reasoning is with consideration for evaluation, addressing criticisms of autoethnography itself, culminating in referring to the QAA (2014) criteria in chapter 2 and autoethnographically in chapter 3.

Johannesson and Perjons (2014) state:

> *"People engage in practices in which they may perceive problems that can be addressed by means of artefacts. Thus, artefacts do not exist in isolation but are always embedded in a larger context".*

Figure 4.11 – People, practices, problems, and artefacts. (Johannesson and Perjons, 2014, p.4).

Johannesson and Perjons (2014, p.4) talk about context and anatomy of artefacts, Fig. 4.11 resonates with me because of the *'triadic continuum and tales of the field'* conversation on p.19.

What Johannesson and Perjons (2014) highlight is that although I may perceive a problem with built environment education, because of my experiences, there may not be a problem. Chapter 3 provides *'insights'* into potential issues, but they are drawn from my experience, of where I perceive a problem with built environment education. However, primarily my use of any developed artefact is to aid my own journey; my priority is not to determine how built environment education should be. It is important to bear in mind the priority of any artefact at this stage, is to satisfy my research objectives (RO's) 1-3. If I focus too hard on trying to re-imagine built environment education to satisfy RO4, it could be to the detriment of the *'insights'* I have to offer, undermining any contribution to knowledge.

Chang (2008, p.107-110) outlines, a *'non-exhaustive'*, list of two types of artefacts; textual and other summarised. Although I personally have an issue with *'lists'* because of what they miss out, ther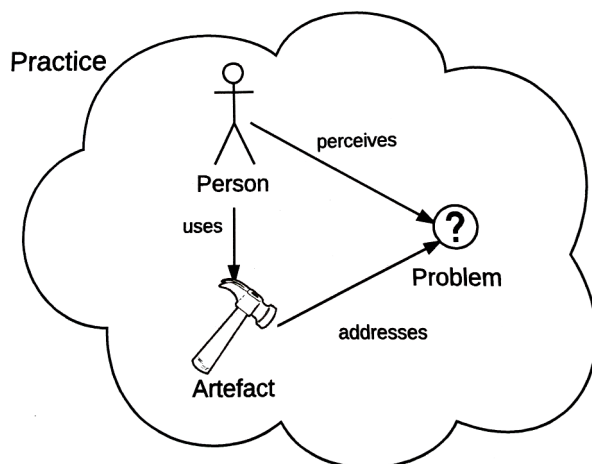e is plenty of scope with artefacts. Built environment education as outlined in chapter 3, offers a range of textual and other artefacts. By adopting some of the principles of design science I can move beyond scientific realism; *'a need to describe, account for, explain and theorize'* (Cherryholmes, 1992); to *'define, suggest, develop, evaluate and conclude, to design and recommend'* (Dresch et al (2015, p.95).

Design science is *'pragmatic and solution-focused'* (Dresch et al, 2015, p.56), orientated with a focus on things that *'do not yet exist'* (Dresch et al, 2015; Romme, 2003); which is useful for informing RO4. It is "*fundamentally a problem-solving paradigm*" (Hevner et al 2004, p.78), where perspectives continuously shift between design processes and designed artefacts. Ontologically design science is in its infancy but is being discussed more within computer and information science communities (Nguyen et al, 2019). Iivari and Venable (2009) suggests it sits within both a realist and anti-realist ontology; this is only helpful in highlighting synergies of hybridity with autoethnography (Reed-Danahay, 1997), particularly as knowledge develops in action (Romme, 2003; van Aken, 2004).

Denshire and Lee (2013) bring autoethnography and assemblage together, to highlight how a *'multi-perspectival assembly of artefacts* can foreground juxtaposed multiple accounts between writer and observed: self and culture. Rodriguez et al, (2017, p.61) question the merits of triangulation in autoethnography, stating assemblage *"rivals triangulation as a promising innovation of autoethnography research"*. In thinking about *'goals'* for evaluating autoethnography (Adams, Holman-Jones and Ellis, 2015, p.102), particularly in *'making contributions to knowledge'*, it is in the more explicit use of language that Design Science suits both my skill and mindset, particularly class of problems and artefacts, and types of knowledge. In better articulating these areas I can better define types of artefacts I will use and begin to focus the story of the characters in chapters 5 and 6.

Classifying problems and artefacts to focus my knowledge contribution

Using autoethnography to reflect on my experiences and extend the existing knowledge of built environment education, I have to acknowledge my contribution to knowledge is both situated and contested (Adams, Holman-Jones and Ellis, 2015, p.102). In my view this is where Design Science benefits autoethnography; by explicitly outlining *'what'* form my contribution to knowledge and practice should take, and *'where'* the insights through any artefact(s) will come from thinking back to Fig. 4.9 (p.98).
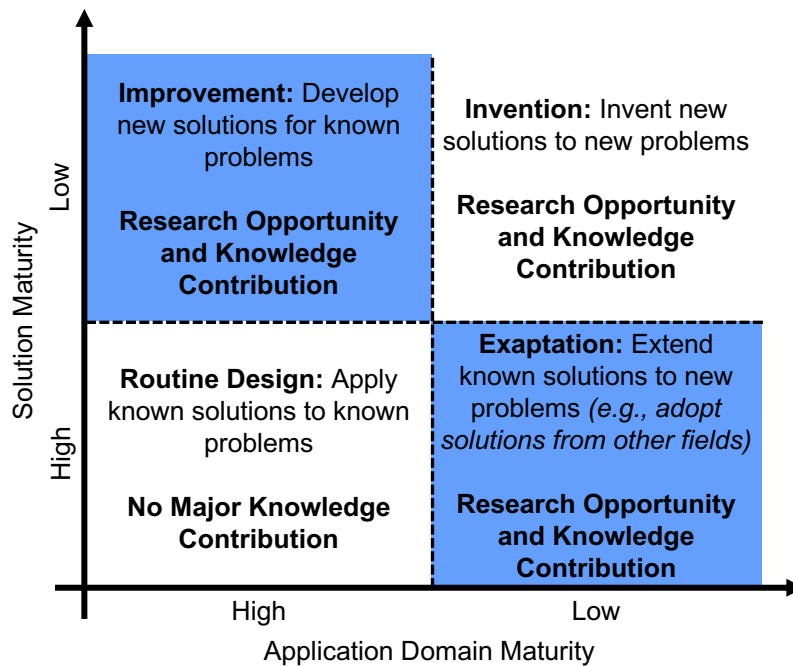
Figure 4.12 – DSR Knowledge Contribution Framework.
(Adapted by author from Gregor and Hevner, 2013, p.345).

Fig. 4.12 is useful, my own contribution to knowledge and practice likely sits within two domains; *'exaptation'* or *'improvement'*. As I seek to *'re-imagine'* I am not looking to invent anything, using autoethnography to explore built environment education there is no *'routine design'*. It is not a case of having to make a *'major contribution to knowledge'*, a small one will suffice, from which *'adopting solutions from other fields'* helps explore *'known problems to develop new solutions',* to improve or *'re-imagine'* built environment education.

Johannesson and Perjons (2014, p.11) state *"improvements are probably the most common kind of design science contribution, and they can be the most challenging because a researcher needs to show that a proposed solution actually improves on the state of the art".* However, by conducting this research through autoethnography, the design and critique of any artefacts is to support my own story. Through *'exaptation'* of *'other fields'* such as DSR and Cybernetics, it is to orientate the story and adopt some of their principles to support autoethnography itself.

Although I feel built environment education can be *'improved'*, made more efficient, flexible, and adaptive to users; it is by adapting existing solutions, repurposing existing artefacts within it that longstanding issues with *'silos'* and fragmentation can be addressed. But only through a transdisciplinary, or *'antidisciplinary'* (Pickering, 2013), *'goal-orientated'* mindset can I explore my own biases to deliver original ideas (Gregor and Hevner, 2013, p.347) in this investigation. In being *'goal-orientated'* I am free from the pursuit of having to gain more knowledge of problems within built environment education; chapter 3 aids better exploration of literature in this chapter.

However, although chapter 3 provides a foundation to inform the *'conversation'* in chapters 5 and 6, there is still a problem to outline. Johannesson and Perjons (2014, p.2) discuss *'practical problems'* – *"undesirable state of affairs or, more precisely, a gap between the current state and a desirable state, as perceived by participants in the practice"*, they continue to state that many practical problems are *'wicked problems'*.

Horst Rittel and Webber (1973) contrast wicked problems with *"tame or benign"* problems, providing ten distinguishing properties of them:

1. *There is no definitive formulation of a wicked problem.*
2. *Wicked problems have no stopping rule.*
3. *Solutions to wicked problems are not true-or-false, but good-or-bad.*
4. *There is no immediate and no ultimate test of a solution to a wicked problem.*
5. *Every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial-and-error, every attempt counts significantly.*
6. *Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.*
7. *Every wicked problem is essentially unique*
8. *Every wicked problem can be considered to be a symptom of another problem*
9. *The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.*
10. *The planner has no right to be wrong.*

The built environment is dynamic, even if built environment education seems static to me, we are in the midst of a global pandemic with coronavirus, any ideas I have to re-imagine could already come as a result of life events forcing change. In making my contribution to knowledge and practice, any re-imagined solution may not be adopted; this is what makes autoethnography important. Knowledge of the culture within built environment education can be extended in RO's 1-3 through my personal insights; without any requirement to test what a re-imagined approach could be (RO4). Considering the last point Horst Rittel and Webber (1973) state *"the aim is not to find the truth, but to improve some characteristics of the world where people live"*; my aim is to provide a truthful account that makes an authentic contribution through autoethnography to deliver its insights.

In chapter 3 *'output theory'* was part of the *'conversation'*, that *"a well-designed learning experience should provide artefacts (graduates), who are representative of the institutional strategy itself"*; understanding the principles of studying artefacts associated with my own experience potentially helps realise this. Principles drawn from different fields such as DSR and Cybernetics can help autoethnography address validity, generalisability, and reliability; other *'fields'* offer a template that others can adapt to their use of autoethnography and how they choose to mould their own stories.

Dresch et al (2015, p.103-5) provide a snapshot outlining *'classes of problems'*, highlighting how artefacts and solutions they provide can be generalized, even if originally intending to generate knowledge for a specific context. Although not wanting to classify problems beyond the theoretical and practical, Dresch et al (2015, p.104) provide some useful points to consider; ethically, classifying problems brings a greater awareness of impact to others; it informs selection of research methods to explore artefacts; in referring to van Aken (2004) is something important to direct me going forward. Van Aken (2004, p.226) states *"design-science is not concerned with action itself, but with knowledge to be used in designing solutions"*. This is where I want to be with autoethnography; providing an opportunity for the characters to focus on *'designing solutions'*, contributing to something more. I get to keep control of the *'kitchen sink'* (Etherington, 2004, p.38), acknowledge my problem is *'wicked'* and focus on meeting the goals of autoethnography (Adams, Holman-Jones and Ellis, 2015, p.102), whilst exploring creative *'solutions'* to make my own contribution to knowledge and practice at doctoral level.

In looking to mobilise artefacts within my experiences in built environment education, considering Chang's (2008, p.107-110) *'non-exhaustive'* list, DSR classifies artefacts differently, but more helpfully I feel. Dresch et al (2015, p.107) discuss *'layers of the artifact development process'*, which includes possible solutions to problems, consideration under construction, and use of artefacts; it leads into classifying artefacts, more helpful to inform my use of autoethnography. Both Johannesson and Perjons (2014, p.29) and Dresch et al (2015, p.109) both classify artefacts into types; '*Constructs, Models, Methods and Instantiations'*. Dresch et al (2015, p.108) add a fifth term *'design propositions'*, but this is a more theoretical form of artefact relating solely to Design Science itself. Johannesson and Perjons (2014, p.30) discuss two more forms of classifications; *'function-orientated and pragmatic'*. Johannesson and Perjons (2014, p.12) also outline *'technical artefacts'* and *'socio-technical systems'*; the latter interests me because it includes the use of artefacts as well as humans, laws, rules etc. to address practical problems, potentially applicable to my exploration of built environment education. I will come to this but first to '*Constructs, Models, Methods and Instantiations'*.

Fig. 4.13 outlines Johannesson and Perjons' (2014, p.29) discussion regarding constructs, models, methods, and instantiations. Dresch al (2015, p.109) provide similar descriptions, but a little more technically. My reasoning for wanting to better understand constructs, models, methods, and instantiations, is to better analyse those associated with built environment education. This is important because my contribution to knowledge and practice likely sits within *'improvement'* and *'exaptation'* (Fig. 4.12, p.102); likely to be instantiations of constructs, models, and methods, critiquing them to inform how to structure the story of the characters through autoethnography. *"Instantiations are the artifacts that operationalize other artifacts (constructs, models, and methods)"* state Dresch et al (2015, p.110). Johannesson and Perjons' (2014, p.30) offer a similar discussion but discuss methods particularly because they may not count if an instantiation is already defined as a working system (instantiation) itself.

CONSTRUCTS
- Terms, notations, definitions and concepts for formulating problems and possible solutions.
- Do not make statements about the world, but make it possible to speak about it.
- Definitional knowledge.

MODELS
- Representations of possible solutions to practical problems (support construction of other artefacts).
- Built up from constructs that are related to each other.
- Prescriptive knowledge.

METHODS
- Define guidelines and process for how to solve problems and achieve goals.
- Prescribe how to create artefacts,
- Highly formalised or informal.
- Prescriptive knowledge.

INSTANTIATIONS
- Working systems that can be used in a practice. However, likely to be an instantiation of another artefact, which works as template, form or idea for a working system.
- Embedded knowledge *(Databases for example)*.

Figure 4.13 – Graphical simple summary of constructs, models, methods and instantiations. (informed by Johannesson and Perjons, 2013, p.29).

What Fig. 4.13 captures is knowledge types, equally useful with differentiating artefacts themselves. Using autoethnography, analysis of artefacts is likely to be of a surface level, awareness of types sufficient, knowledge types is a conversation to develop in considering built environment education. Coming back to *'socio-technical systems'*, Johannesson and Perjons (2014, p.12) state *"socio-technical systems are also artefacts in that they have been purposely designed to address a practical problem or enable some human endeavour"*. Through autoethnography I can critique built environment education and its *'purposely designed'* artefacts, such as modules or curriculum, safe in the knowledge (of any type) that I am now more informed by DSR in how I look at them moving forward as a *'working system'* myself; an artefact of a *'purposely designed process'*.

Knowledge and the relationship between theory and practice

Holman-Jones, Adams and Ellis (2016, p.23) highlight how autoethnographic texts seek to make contributions to knowledge drawn from past research. Anderson and Glass-Coffin (2016, p.65) highlight that autoethnographers collect data that requires *'improvisation, experimentation and interpretation'* to present it in different ways; from my journals, personal memory, and other data I have. They also highlight this can create issues methodologically for would-be autoethnographers, who particularly undertake autoethnographic research for theses and dissertations, where more explicit discussion is needed.

Autoethnography can be framed with theories, not in a scientific sense with a hypothesis, but more as conjecture or postulate to explain a social phenomenon; an explaining tool (Chang, 2008, p.137). In my case *'Graduate Attributes' (output theory)*, an aspirational term, but a useful tool for me in this thesis; *'Graduate Attributes'* links institutional strategy to realising my own learning gain. Chang (2008) highlights the goal of autoethnography is not to establish new theory, the principle behind *'output theory'* is to orientate this research.

To be doctoral the QAA (2014) criteria suggests that a *'holder of a doctoral qualification'* has to *'postulate'* in *"the absence of complete data"*; is this possible through inductive and deductive logic alone? Dresch et al (2015, p.61) state; *"abduction is considered a process that is, above all, creative"*, suggesting this type of reasoning is intrinsic to the creative process. Dresch et al (2015) state abduction is *"the only scientific method that enables the introduction of a new idea"*. So, in telling an autoethnographic tale, it can be designed scientifically without influencing the content itself. Costa et al (2017) provide a simplistic representation (Fig. 4.14) of how abduction can help a *'researching professional'* make *'intuitive leaps',* to bring congruence between theory and practice.

Through autoethnography I can explore synergies between theory and practice to elaborate on my experiences (Fig. 4.14); between the data I have and how I piece it together. Inductively I can describe and understand built environment education, deductively I can test theory through re-telling the story of my *'lived experiences'* of it; abductively evaluate existing theories to challenge current practice in construction and education, by antagonising the data I have and my belief it needs re-imagining.
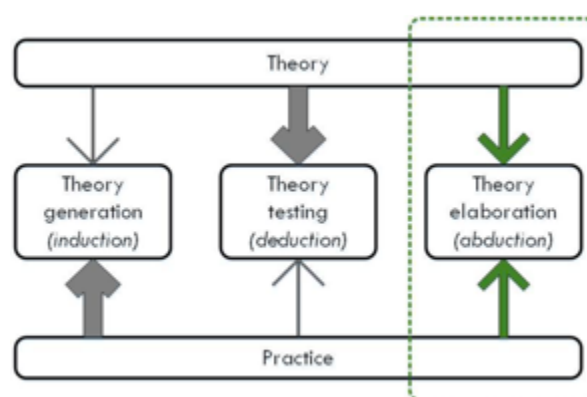

Figure 4.14 – Inductive, deductive and abductive research and the selected approach. (Costa et al, 2017).

Exploring Cybernetics, Synergetics and DSR, classes of problems and artefact types is useful, staying out of built environment education within this chapter keeps a focus on my *"self-as-researcher"* (Throne, 2019, p.28). As a *'working system'* I am developing a deeper curiosity of how knowledge manifests itself, from the *'purposely designed'* artefacts of my built environment education to how I have experienced them. Interest in types of knowledge has developed since working in academia and during my doctoral journey, curiosity sparked by previous student experiences, which on reflection I feel were confused, potentially as a result of the *'purposely designed'* artefacts created by others.

For example, the Construction Industry Council (CIC) *'Higher Education Graduate Common Learning Outcomes'* (Fig. 3.21, p.77) includes personal skills, technical knowledge and professional knowledge; reference is made to *'reviewing and identifying your own learning needs'* but it offers little beyond disciplinary knowledge. As a *'model'* it offers prescriptive knowledge (Fig. 4.13, p.106); as an *'instantiation'* it offers little value to learners themselves during the process of learning, yet it is an artefact representing many professional bodies who accredit courses.

The Oxford dictionary (Lexico, 2020) defines knowledge as:

> *"Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject"*

This definition outlines both objective *(facts)* and subjective *(skills)*, also types of knowledge *(theoretical and practical)*. Typically in built environment education reference is made to academic and professional knowledge; Gibbons et al (1994) traditional and transdisciplinary modes to knowledge a typology widely referred to. Scott et al (2004) discuss academic and professional knowledge but do so outlining four *'modes'*: Mode 1 – Disciplinary knowledge; Mode 2 – Technical rationality; Mode 3 – Dispositional and transdisciplinary knowledge; and Mode 4 – Critical knowledge. Scott et al (2004, p.53) in discussing hybridity suggest that as students transition through programmes, they use any combination of these *'modes'*, but are likely initiated with disciplinary knowledge first. Scott et al (2004, p.41) question the typology Gibbons (1994) offers; that *"disciplinary knowledge is constructed in the university and transdisciplinary knowledge produced outside the university"*.

My built environment education comes from formal study and *'learning-on-the-job'*, it offers a mix of vocational, academic, and professional environments. I agree with Scott et al (2004) that Gibbons et al (1994) is an *'outmoded'* ideal; however, I question the four *'modes'* Scott et al (2004) offer also. As a potential doctoral graduate and *'advanced knowledge worker'* (Boud and Lee, 2009, p.18), I need to be aware of rabbit holes like this; makes me question the relevance it brings to the *'conversation'*.

In built environment education disciplinary knowledge is a problem, in tertiary education it can confuse or limit learners in my view; *'siloed'* disciplinary training (practical) and a true *'higher'* education (theoretical) are two different things. Not wanting to complicate things two *'modes'* will suffice for now, it lends itself to the *'theoretical and practical'* within the dictionary definition (p.107). Fulton et al (2013, p.14) refer to Gibbons et al (1994) to suggest DProf's *'tend to'* generate more Mode 2 knowledge, a traditional PhD more likely to generate Mode 1 knowledge.

Table 4.1 – Comparing Mode 1/ Mode 2 knowledge production. (Fulton et al, 2013, p.14).

Comparison of Mode 1 and Mode 2 knowledge production	
Mode 1 Knowledge	Mode 2 Knowledge
Has clear academic content	Is related to the content of the application area
Focuses on single discipline	Crosses discipline boundaries
Is of a more theoretical nature	Is applied, takes account of the political and other contexts
Is within the control of the individual and their academic peers	Reflects practice and is affected by the complexities of the world

Fulton et al (2013, p.14) usefully summarise Mode 1 and Mode 2 knowledge (Table 4.1), highlighting it is not as black and white as picking a *'mode'*. As a '*researching professional'* I lean towards Mode 2, where reflexivity comes to showcase my positionality and challenge my biases, beliefs and experiences of built environment education. Fulton et al (2013, p.16) highlight it would be *"easy to think of Mode 1 as theory and Mode 2 as practice"*, but for a *'pracademic'* working in academia this would be a mistake. The gap in knowledge I see is in the relationship between theory and practice, between the *'design' (theory)* and *'delivery' (practice) 'conversation'* within built environment education; I need to antagonise this gap through autoethnography and the insights to come from the characters.

Fulton et al (2013, p.16) refer to Carr (1986) to discuss a different approach to explore the relationship between theory and practice, highlighting four types of theoretical issues (Table 4.2). *'Modes'* inform the *'purposely designed'* artefacts of my built environment education, but Table 4.2 offers a simple framework to explore the relationship between theory and practice; pragmatic exploration through the *'working system'* of my experience.

Table 4.2 – Summary of Carr's four types of theoretical issues. (Fulton et al, 2013, p.16).

Theory as applied to practice	The *'common-sense'* approach
Application of existing theories to generate ideas or questions about practice.	Implicit knowledge drawn from a practice setting in skilled manner.
Theory which is derived from practice	The critical consideration of practice
Full articulation of theory informed by practical knowledge drawn from experience.	Closely examine practice, questioning why things done in a particular way.

Re-visiting Design Science briefly I want to move the *'conversation'* past the disciplinary and transdisciplinary *'modes'*. Johannesson and Perjons (2014, p.21) provide a helpful chapter focused on knowledge *'types'* and *'forms'*; definitional, descriptive, explanatory, predictive, explanatory, and predictive, and prescriptive types of knowledge, leading to the distinction they make between *'types'* and *'forms'*:

> *"While knowledge types describe the purposes for which knowledge can be used, knowledge forms specify how it can be materialised, i.e. where it exists and in which shape. Knowledge forms are important for design science research, as it creates not only knowledge explicitly codified in documents but also embedded in artefacts."*

Splitting knowledge into *'types'* and *'forms'* feels unnecessary, but it is with built environment education in mind that it is useful; artefacts span both education and construction, when thinking of *'artefacts'* I am also including people. Johannesson and Perjons (2014, p.25) highlight both explicit knowledge and embodied knowledge (tacit); I will re-visit both in a more autoethnographic conversation in chapters 5 and 6 through characters themselves. I want to focus on a third *'form'* Johannesson and Perjons (2014, p.26) highlight, embedded knowledge which they state:

> *"Embedded knowledge resides not in humans but in entities, such as physical objects, processes, routines, or structures."*

I see patterns within the *'processes, routines and structures'* of built environment education; how the principles behind artefacts or the thinking of others is embedded into the models and methods used. However, much of this is an implicit process, which I will explore as we progress in this chapter and chapters 5 and 6. As students we are artefacts of certain *'processes, routines and structures'* that influence our learning experiences; which takes place in both a formal educational environment and in a workplace setting. As students we are also influenced by the pre-conceptions, beliefs and thinking of others who *'scaffold'* and *'embed'* knowledge; which I will come to shortly.

Simon (1996, p.93) suggests as *'experts we possess both knowledge and skills'*; that there is a subtle difference between them. Simon offers an example, but I will offer another. An iPhone has knowledge embedded within it, yet it is not the designer's knowledge we see as users; it is the designer's skill that transmits the embedded knowledge to us and how we intuitively use it. We can explore an iPhone's functionality and structure, we can do this with built environment education to unlock new insights into it. What I am particularly interested in here is the *'processes, routines and structures'* of experiential models; how do they link theory and practice, to transfer embedded knowledge. This is where I see a disconnect between experiential models I have experienced and experiential reality, which I will come to. From a better understanding of how to study artefacts through DSR, it is to explore this more so in an autoethnographic conversation in chapters 5 and 6.

As a *'pracademic'* I have always been conscious of over-relying on my practical knowledge. Harland (2012, p.58) observed how the thinking of new lecturers can be transformed, by moving away from a *'reliance on tacit knowledge and experience'* and embracing learning theories, particularly those offering *'genuine utility'*. Harland (2012, p.58) refers to *'student learning'* as opposed to teacher training, suggesting it *'can be a powerful catalyst for change'* thinking this way. For much of my adult education learning theory has been non-existent, or not explicitly expressed; I want to explore this particularly in chapters 5 and 6 autoethnographically, it feels like a more *'common-sense'* approach to take.

However we split up and describe knowledge, a professional built environment education is significantly influenced by folk knowledge; which *'revolves around existing beliefs and practices of others'* (Powers, 2017). Powers (2017, p.21) highlights how a *'folk pedagogy'* comes as a result of educators taking abstractions from professional working practices, and *'recasting them in a theoretical foundation to teach design'*; the result of which Powers (2017, p.21) states is:

> *"a pedagogy that is highly reflective of design practice but not always in focus with how people actually learn to design."*

I can extend this to all my built environment education, I do question how *'highly reflective'* my formal education has been of practice; much of my formal education at times has lacked the theoretical foundation to explicitly underpin it also. However, I will follow the advice of Bruner (1996, p.44) and concentrate on this in the context of my experience, rather than generalise on its impact too theoretically. It is through a combination of knowledge and skills, theoretical or practical, that as learners and professionals we interchangeably use and apply them within a range of environments; knowledge gained in one transfers to an applied skill in another.

Autoethnography benefits from my skills and experience, together they can create new knowledge and insights but only in the context of this research. Osbourne (2013, p.94) refers to Kundera (1988) who argues *'that the history of the novel is the history of different kinds of knowledge, but that it applies in the context of the novel'*. In supplying knowledge in this thesis it aims to provide new knowledge, but in the context of my own experiences of built environment education. What you as the reader gain is insight into my *'epistemological development'* (Moon, 2005, p.8), my contribution to knowledge is actually in my skill and use of autoethnography, the fusion of various kinds of knowledge embedded within it. In any claims to originality I make, it is likely many of the definitions Hart (1998, p.24) provides could be demonstrated. However, it is important not to overstate the value of my personal insights beyond being an authentic account of my own experiences, because it is situated and contested knowledge.

Harasim ((2017, p.32) suggests in 1000 years of formalised learning, learning theory has only emerged over the last 100; positivism a strong early 20th-century influence. Schön (2016, p.46) discussing the impact of positivist epistemology of practice on professional knowledge, refers to Herbert Simon who *'suggests all professional practice is centrally concerned with design'*. But Schön (2016, p.46) however, states *"design in this sense is precisely what the professional schools do not teach"*. Simon (1996, p.138) argues that technical education, a proper study, should focus on the *'science of design'*. My focus is exploring experiential learning models associated with humanism primarily, how theories underpinning them influence my experiential reality. In my view there is a disconnect between them, I want to explore this now because it informs part of my autoethnographic conversation in chapters 5 and 6; it also informs an area where I feel I can make a small contribution in my recommendations.

But first; what is a theory? Torraco (1997, p.115) states:

> *"a theory simply explains what phenomenon is and how it works. A theory explains the phenomenon by identifying the main ideas, or concepts, and by stating the relationships among these concepts. Concepts and their interrelationships are the elements of theory that are common to most methodologies for theory building."*

Chapter 3 outlines the *'phenomenon'*, the main idea of *'output theory/ Graduate Attributes'*; influential concepts and elements are outlined, to nuance theory with my own experience. So, I am theory building, exploring the *'elements'* to better understand my own experience, in doing so it is to bring stronger insights and enrich my own autoethnographic story moving to chapters 5 and 6. Wilson (1997, p.23) offers a further array of considerations with theory; that observations and evidence are connected through our experience, which influences our reasoning and theorizing; that theories offer many ways of seeing; helping us envision new worlds, or ways of doing things; they shape our world and the realities we create; from theory we can make things; lastly, theories keep us honest. Wilson (1997, p.24) highlights how *'theory is often contrasted with practice'*, but that it can be *'offensive'* to draw such stark boundaries because theorists practice and practitioners theorize; just differently. Wilson further highlights the importance of the roles:

> *"Theorists and practitioners are different roles within practitioner communities. The theorist role is to reflect on problems, study and research questions, and share knowledge with the group. The practitioner role is to thoughtfully use knowledge toward the solution of problems. Both roles are essential to good practice and good theory."*

As a *'pracademic'* this resonates, I am guilty of contrasting the two at times. The two roles are not equally appreciated, too often we contrast theory and practice; theory generally can be let down by poor communication and delivery, an area to improve on.

I question much of my built environment education and how successful it has been at times, but stepping off the *'well-worn path'* has offered a richer experience; contributed to my holistic mindset. My formal education has been a largely *'machinistic'*, modular endeavour, but a significant part of my education and experience has been in informal environments. Scott et al (2004, p.133) state *'experiential learning is considered key to adult forms of education or andragogy'*, not just my professional doctorate.

However, Usher et al (1997, p.42) suggest experiential validation is flawed as a pedagogical approach because we can fail to go beyond the boundaries and limitations of our experience (Scott et al, 2004). My exploration of learning theories is to underpin and better understand my experience, to support my use of autoethnography and deliver the insights needed to make my contribution to knowledge and practice. I need to creatively explore ways to do this pedagogically, but first the appropriate learning theories need to inform my approach to this; to help me *'connect-the-dots'*.

From an understanding of what a theory is, Harasim (2017, p.4) states *"a theory of learning aims to help us understand how people learn"*, continuing *'theoretical approaches became compartmentalised in the 20th century; a battle between two polar opposites 'scientific' and 'social'*. Harasim (2017, p.10) outlines three 20th century learning theories, behaviourism, cognitivism, and constructivism, with 21st-century learning theories, connectivism and collaborativism. I am drawn to constructivism and humanism, more so humanist theories; it underpins my current learning environment at doctoral level. Learning theories associated with behaviourism and cognitivism do inform my built environment education; however, because they have been implicitly used, it is through autoethnography they may be teased out in chapters 5 and 6. It is in trying to better understand the theories, making better sense of my learning at different times, that I feel I can better demonstrate my own learning gain; insight into how I learn is embedded in this thesis.

Aubrey and Riley (2016) offer a range of learning theorists and their ideas, from Dewey, Piaget, Montessori, Vygotsky, Bloom, Bruner, through to Freire, Schön and Kolb; an array of learning theories simply discussed. Likewise, Bates (2016) comprehensively covers many learning theories and modes of learning; with more clarity in directing through them. First, Bates (2016) focuses on what he calls *'classical learning theories'*: behaviourism, cognitivism, humanism and neurolism; Bates (2016, p.73) admits he adopted neurolism from neuroscience. Constructivism is present in Bates (2016), theorists like Vygotsky and Piaget sit within cognitivism. *"Constructivism refers both to a learning theory and to an epistemology of learning"* (Harasim, 2017, p.12), my immediate focus is learning theories; epistemology formed part of the conversation in chapter 2.

Aubrey and Riley (2016, p.155) credit David Kolb with experiential learning theory, which developed upon existing theories of Dewey, Lewin, Piaget, Jung, and Rogers; Dewey began a movement that others have followed (Bates, 2016, p.18). Dewey (1938) brings questions of how far we have travelled in reality? Dewey (1938, p.19) describes traditional education as *'static'*, with *'little regard for the future'*; a *'cultural product of society'*. Montessori also challenged the benefits of a curriculum that caters more for society than the learner, Aubrey and Riley (2016, p.20) state:

> *'Montessori saw this educational experience as one of which was largely demotivating and responsible for some of the problems inherent in education of the time'*.

'Staticness' resonates with my experiences of built environment education, actually all my education. *'Little regard'* can be given to learners, assumptions the future will be like the past seems engrained; Will the future in 100 years' time make for the same reading?

Both Dewey and Montessori promote and value *'learning-by-doing'*, through experience; however, Montessori offers a better opportunity to navigate a future. Knowles, (2015, p.105) suggest Dewey's work is more educational philosophy than learning theory, recognising Dewey was the first to directly protest against elemental educational models. Bates (2016, p.42) places Dewey within cognitivism to discuss *'intelligent action'*. Aubrey and Riley (2016, p.7) outline Dewey's *'multi-faceted influence'* and includes humanism. Hase and Kenyon (2013, p.21) place Dewey in constructivism to discuss with humanism, to demonstrate how assumptions from both underpin heutagogy. Wherever Dewey is placed, Hickman (1992) and Fesmire (2003) rightly highlight he was a pragmatist, believing in theories offering practical application. Dewey's pragmatic approach to theory resonates most, those offering *'genuine utility'* (Harland (2012, p.58) and that can be crystallised in reality which Montessori certainly offers. Bates (2016, p.57) states:

> *"Humanism is based on the belief that the individual is self-determining, free to make their own choices. It is a person-centred activity in which the individual plays a part in deciding what role they should play in determining what they should be allowed to learn. The basic premise of humanism is that people have a natural potential for learning and that significant learning takes place when the individual can see the subject matter is relevant to them."*

When writing and learning are congruent; crystallisation of theory is never far from reality. Despite the work of Dewey and Montessori being central to humanistic education early in the 20th century, Abraham Maslow and Carl Rogers are widely accredited with developing associated theories in the mid 20th century. I will come to them but do not want to bypass Montessori, because like Dewey there is a simple pragmatic quality in her work. At doctoral level I am supported within a humanist learning environment representative of a Montessori environment in early years, helping me unpack earlier learning experiences.

Maria Montessori rejected behaviourist approaches to teaching skills through repetition and instead focused on developing exercises to help the senses to see, smell, hear, feel and touch (Bates, 2016, p.62); integral to developing my tacit knowledge in practice. Montessori developed theories through careful and clinical observations of children she worked with; theories developed and evolved naturally over time; greater importance given to the needs of the child than a curriculum for societal needs. Like Dewey, Montessori offers many ideas, it is impossible to sufficiently explore them all in this thesis.

Aubrey and Riley (2016, p.23) outline three interrelated components with Montessori's methods: the child, the favourable environment and the teacher; my thoughts are on structuring *'conversations'* in chapters 5 and 6, with the characters and different periods of my built environment education. Another area Aubrey and Riley outline is her series of stages or *'planes of development'*. Issacs (2018, p.19) provides a chapter breaking these *'planes of development'* down further to outline the periods of sensitivities; I want to re-imagine the *'planes'*, look to develop an experiential model which offers a lifelong meaning to them. Ramputty (2015, p.16) visually depicts these four *'planes',* in providing an autoethnographic thesis focused on her experiences of Montessori, which is adapted and presented in Fig. 4.15.
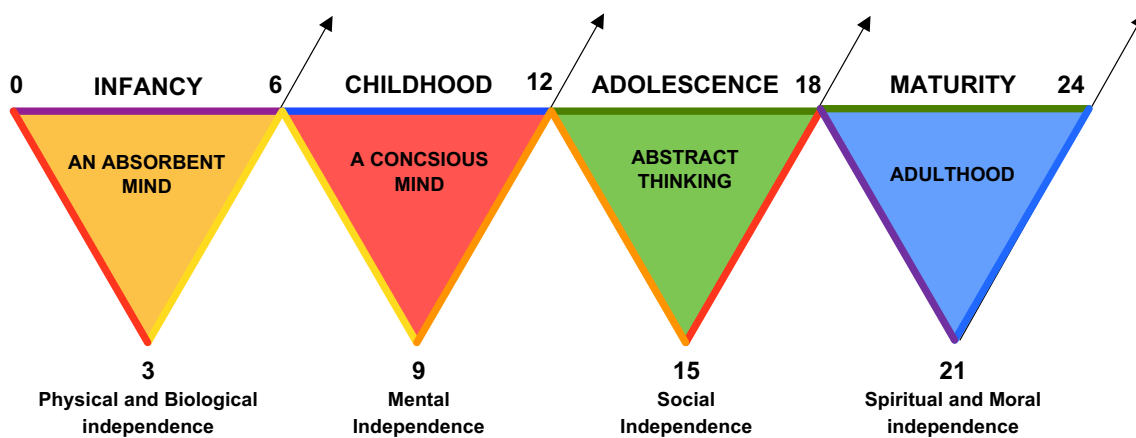
Figure 4.15 – Montessori's 'four planes of development'. (By author, informed by Ramputty, 2015, p.16: Aubrey and Riley, 2016, p.23: Montessori, 2014).

Fig. 4.15 utilises Ramputty's model, the central text is from Aubrey and Riley (2016, p.23) and Montessori (2014). Combined with '*the child, teacher and environment'*, Montessori helps to *'scaffold'* my thoughts. The *'planes'* (Fig. 4.15) draws me to the cybernetics and synergetics *'conversation'* earlier in this chapter. However, the *'ages'* in each *'plane'* is problematic, Fig. 4.15 is too linear; what happens beyond 24 years old when life events bring a child-like curiosity to learn? We cannot *"merely get older"?* (Montessori, 2014). My focus on her is two-fold, she offers no visual model of her method, from exploring other experiential models I can begin to re-imagine her *'planes'*.

Montessori has significantly influenced humanism, but others do get more attention and credit. Montessori has her critics, Kilpatrick (1914, p.14) writes a *"Montessori child is an isolated worker".* Thayer-Bacon (2012, p.4) argues there is a '*troubling, gendered side to Montessori's story'*, one affecting her both personally and professionally, that still lingers and affects her contribution to educational theory. For me Montessori stands out as a giant amongst men, I will explore two more briefly now: Carl Rogers and Malcolm Knowles.

Rogers was a driving force in the humanist movement (Bates, 2016, p.66), like Maslow he was primarily concerned with self-actualization (Knowles, 2015, p.74); focusing significantly on facilitation as opposed to teaching. Rogers (1969, p.103) viewed teaching as *"a vastly over-rated function"*, and *'was not interested in instructing others or imparting knowledge and skills'*; which leaves me thinking what consideration was given to prior knowledge or experience of learners? Facilitation still requires instruction. In built environment education however much we facilitate, instruction is designed into our learning programmes, through modules and learning outcomes. Rogers (1969, p.164) provides ten principles for facilitating humanistic learning which Sharples (2019, p.235) more concisely provides to state a facilitator:

1. *Sets the initial mood of the class or experience.*
2. *Elicits and clarifies the purposes of individuals as well as the entire class or group.*
3. *Relies on each student to motivate the learning, for purposes of personal meaning.*
4. *Offers a wide range of resources.*
5. *Is a flexible resource to be used by all.*
6. *In response, a facilitator accepts both intellectual content and emotional attitudes of the students*
7. *Can become a participant learner.*
8. *Can take initiative in sharing feelings and thoughts, in ways that do not demand or impose.*
9. *Is alert to expressions of deep feeling and tries to understand these from the person's point of view.*
10. *In functioning as a facilitator, a teacher or leader tries to recognise and accept personal limitations.*

The principles Rogers offers aid reflection on my *'pracademic'* position, highlighting the importance of exploring pedagogy that places an emphasis on conversation and reflective practice. However, what interests me most about Rogers is his attitude to teaching; how it transmits from others that do not facilitate or *'scaffold'* learning properly. I agree in essence with what Rogers (1969, p.103) states, but I just think it has been poorly communicated. Good facilitation is not teaching knowledge and skills; it is in facilitating a process that effectively supports the acquisition of them to others. As facilitators, *'experts'* (Simon, 1996, p.93), we know where learners are going, there is a need to appreciate our *'skill'* is teaching the process of acquisition for others to attain knowledge; however, by *'design'* we more explicitly focus on subject content potentially.

In my experiences of built environment education, both as student and pracademic, I believe some have taken Rogers (1969, p.103) too literally at times. They do not *'teach'* or *'impart'* the knowledge and skills which I can understand, but the process to acquire the knowledge and skills in facilitating or *'teaching'* of others can be undervalued or missing. In my view I feel this is best reflected in the attitudes towards graduate attributes and employability, why I value them personally as an *'artefact of output'*, where others may not appreciate them.

In respect to employability Rich (2015, p.9) states that '*academics debate about the extent to which employability is an intrinsic quality of the graduate*'; he continues to rightly highlight *'employability is not employment'*, which many in built environment education do confuse. Sub-consciously it could be suggested the embedded knowledge of learning theorists like Rogers has been transmitted to others in how they facilitate learning, it could be suggested theory has been empirically tested by others in transmission. However, further exploration is required, which I will explore shortly through experiential models.

Rogers may be considered *'a driving force'*, but it is with Malcolm Knowles that I have come to question areas of my built environment education in respect to curriculum. Knowles is widely credited with raising awareness of adult education, that when *'adults are taught in the same way as children they can become de-motivated'* (Aubrey and Riley, 2016, p.88). Alexander Kapp (1833) is credited with first using *'andragogy'* (Maes and Sylin, 2016, p.226; Loeng, 2017), but Knowles is best known for popularising the term. With no single theory of adult learning, Merriam et al (2007, p.83) suggest it is Knowles and andragogy which provides the best-known contribution.

Andragogy does have its critics, Merriam et al (2007, p.85) chronicle a topic that *"stimulates controversy, philosophical debate and critical analysis"*. Hartree (1984) and Rachal (2002) question the science; if andragogy is a theory or set of assumptions. Criticism centres on limited empirical investigations and *"questions are still unanswered"* (Rachal, 2002, p.211); there is an absence of *'operational definition'* to base a theory or unifying concept/ model of adult education on. Still andragogy endures so it must be doing something right some 50 years on. As somebody who is very process-driven, who seeks to better understand how I have learnt at different times, Knowles et al (2015, p.51) make the distinction between *'process'* and *'content'* models of learning. I want to explore this further in the context of my experiences, to look at the transitions in various stages within it and identify potential issues with curriculum models. Knowles et al (2015, p.52) offer process elements of andragogy, comparing it to pedagogical approaches to learning; I will explore this autoethnographically within chapter 5, as I want to focus on experiential models which includes Knowles et al (2015, p.6) andragogy model.

It is in the models offered with theories associated with humanism that I come to Maslow's *'hierarchy of needs'*, to Maslow (1943) who outlines his theory of human motivation, the foundation for visual representation of the hierarchical pyramid model. Maslow (1954, p.97) discusses *'higher and lower needs'*, which if anything I find largely *'de-motivating'*, not useful for my purposes; however, it has been used in my built environment education. Within both Maslow (1943) and Maslow (1954), no pyramid model is present. Bridgman, Cummings and Ballard (2019) state *"Maslow did not create his famous pyramid"*; Charles McDermid (1960) is credited with the *'earliest rendition of Maslow's Pyramid'* (Fig. 4.16).
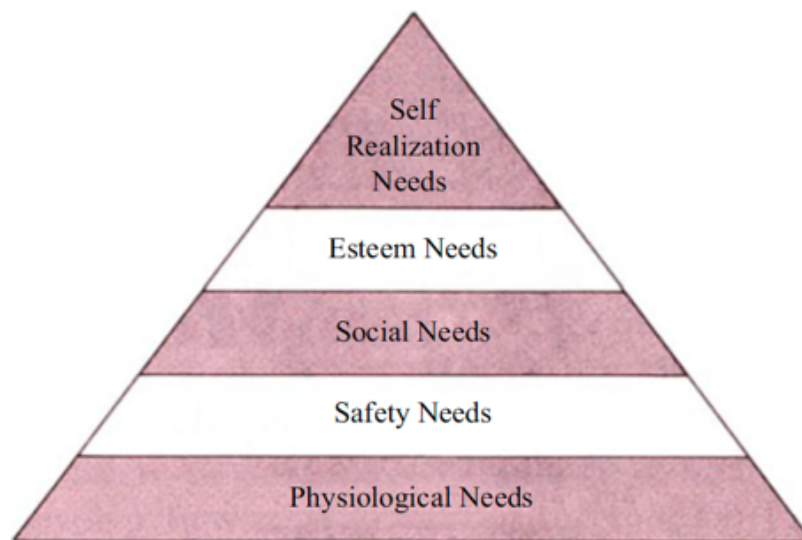
Figure 4.16 – Probably the earliest published rendition of "Maslow's Pyramid" by C. McDermid, 1960. (Bridgman, Cummings and Ballard, 2019, p.87).

Kolb (2015, p.93) includes criticisms of his own experiential learning model, namely from Wilson and Hayes, 2002, p.174) who state:

> *"Kolb's learning cycle has become as ubiquitous as Maslow's hierarchical triangle. That is not just unfortunate, but limiting, because it restricts the way we see and understand experience which thus limits the way we can learn in-from-to experience."*

I will come to Kolb's model, it is with Wilson and Hayes (2002) highlighting issues with *"Maslow's Pyramid"*, or should I say *'McDermid's Pyramid'*, we can begin to appreciate the issues with visual models to explain experience; models and conceptual frameworks are an individual endeavour. As a learner I see no value in Fig. 4.16, it does not bring congruence to how I think and learn; it is linear, lacks context and if anything undermines the value of Maslow's theory. However, *'despite Maslow not being interested in testing his theory empirically'* (Bridgman, Cummings and Ballard (2019, p.87), nor being responsible for the *'hierarchical pyramid'*, Maslow's knowledge is embedded within Fig. 4.16 and subsequent *'renditions'*. Empirically, it could be suggested Maslow's theory has been tested and offers questionable value to warrant its use in educational practice in reality.

Maslow's theory it appears is a hypothesized theory, not one derived from practice. By his own admission, Maslow possibly has fallen foul of not giving sufficient attention to the dual roles of theory and practice (Wilson, 1997, p.24); for my purposes it means it is not a good theory to explore. If it was a good theory others like McDermid (1960) would make reference to *'motivation'* to better link theory and practice, six relationships in Fig. 4.16 (p.117) would have perhaps led to greater synergy between theory and model; instead we have a theory working against the geometry of a poorly thought out model as a result.

In respect to Kolb's experiential model, Aubrey and Riley (2016, p.159) provide a version (Fig. 4.17) I typically see used in built environment education; Aubrey and Riley (2016, p.159) outline *'learning styles'* *(below)* associated Fig. 4.17.

- *Diverger – combining CE and RO*
- *Assimilator – combining AC and RO*
- *Converger – combining AC and AE*
- *Accommodator – combining CE and AE*
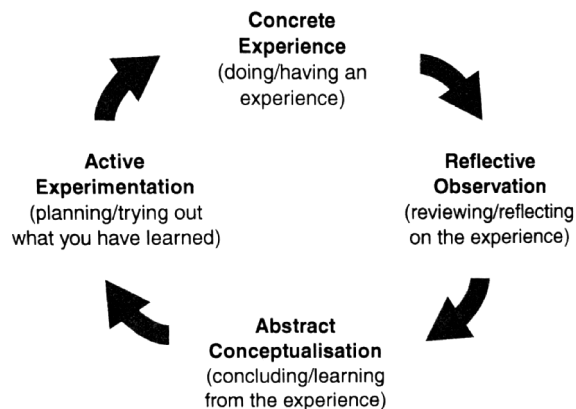
Figure 4.17 – Kolb's (1984) Experiential Learning Cycle. (Aubrey and Riley, 2016, p.159).

Fig. 4.17 represents the more Lewinian experiential learning model, which Kolb (2015, p.69) discusses with Dewey's model of experiential learning (Fig. 4.18); its multi-loop cycles also fails to bring congruence to how I think and learn in an experiential reality. Maslow and Kolb both offer a theory, but only Kolb has consciously produced a model of his own thinking. By his own admission some 30 years on, Kolb (2015, p.93) accepts he has failed to adequately explain his own model from his own perspective at times. Kolb's theory in reality, and any model of it, provides insight into how it has fared in practice; I have never consciously learnt with it, and I am confident many operating in built environment education have not either, so as staff why do we use them?
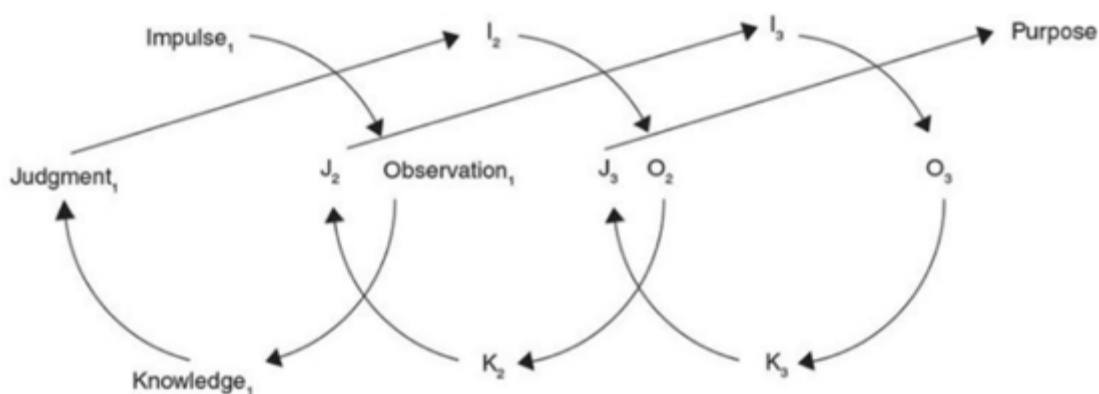
Figure 4.18 – Dewey's Model of Experiential Learning. (Kolb, 2015, p.71).

Kolb (2015) offers an appreciation of how time benefits theory, providing a solid knowledge base that draws extensively on the research of others such as Piaget. Piaget although critical of Montessori's work, suggesting it lacks creativity and exploration was significantly influenced by Montessori (Halfpenny and Pettersen, 2014). Research aimed at education was not Piaget's original intention Jarvis and Chandler (2001) suggest, yet we possibly have Montessori's method reflected in his model, which Kolb (2015, p.91) further developed to offer a better understanding of his experiential learning cycle model (Fig. 4.19). The role autoethnography plays here is in providing a method to help me conceptualise ideas on models, which in turn gives a focus to my own story.
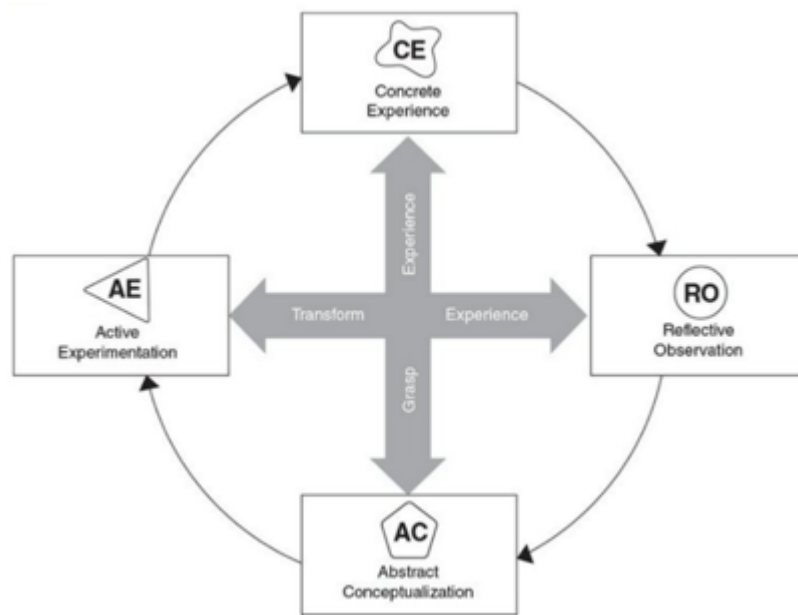
Figure 4.19 – The Experiential Learning Cycle. (Kolb, 2015, p.92).

Fig. 4.19 includes two additions, which are missing from Fig. 4.17 (p.118) and undermines the integrity of that model in reality. Fig. 4.19 includes *'grasp experience'* and *'transform experience'*; *'intuitive leaps'* can be made abductively depending on personal experience. It is an improvement on a sequentially linear process depicted in Fig. 4.17 (p.118).

Fig. 4.19 is still an *'over-simplified'* model of a messier experiential reality, it may concern Wilson and Hayes (2002, p.174) and others but it brings more congruence to my own thinking. Kolb (2015, p.93) acknowledges criticisms, in doing so we gain an insight into experiential learning theory. Kolb (2015, p.94) aimed to *"create a model for explaining how individuals learn and to empower learners to trust their own experience and gain mastery over their own learning"*. The real lesson Kolb provides though is that by a developing model to explain how *'others'* learn, he actually detracts from his own theory. Contrast this with Montessori and Maslow, they offer theories to assume you will make your own model: Montessori a method.

To take the analysis of experiential models a little further and to highlight how they can be limited in an experiential reality, I come back to Trafford and Leshem's (2008, p.37) good/ poor viva models momentarily. In discussing intuitive dream enquiry Lemke (2018, p.179), brings an instant connection for me with Trafford and Leshem's (2008) *'quadrants'*.
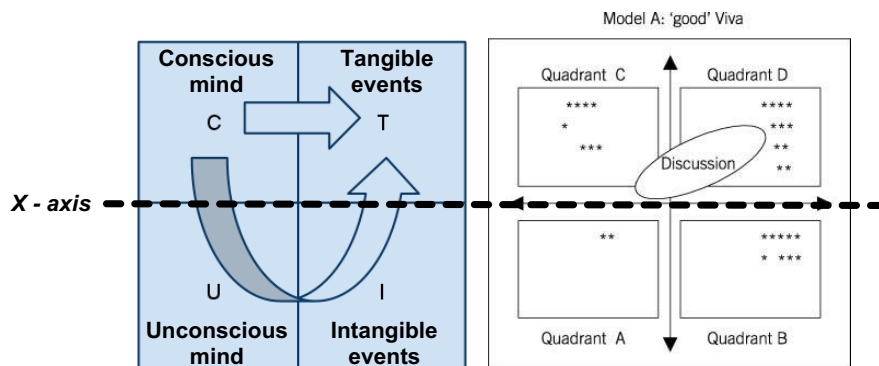
Figure 4.20 – Kerr and Key (2011) adapted model of Jahn and Dunne (2001) model of mind-matter interactions, in Lemke (2018, p.180); brought together with Trafford and Leshem (2008, p.37) 'good viva' model.

Lemke (2018, p.179) discusses Kerr and Key's (2011) model (Fig. 4.20, *left*) to highlight limitations of fields that sit within positivist paradigms; *"conscious mind (C) to tackle tangible (T) events and process of the physical model"*. They sit above the central X-axis; a clear correlation with Trafford and Leshem's (2008) *'good model'* of a viva discussion (Fig. 4.20, *right*). The viva, a tangible event (T) sits within quadrants C and D; quadrant A (The Technology of the Thesis and quadrant B (Theoretical Perspectives) is largely disregarded. Lemke (2018, p.180) states:

> *"The area below the X-axis represents all the aspects of a psychological phenomenon, which remain disregarded and are somewhat difficult to assess limiting oneself to a positivist approach. Furthermore, the model implies that knowledge phenomenon acquired through the positivist approach might not be as complete as it seems, as the internal processes below the X-axis are entirely neglected yet part of the phenomenon as a whole."*

In Fig. 4.20 quadrant A (U) is under the X-axis, it connects theory (quadrant B) to practice (quadrant C) to realise the *'aspirational'* quadrant D (T). Quadrant A heightens my interest in the mechanics, the *'nuts and bolts'*. But what intrigues me more in Fig. 4.20 with Kerr and Key's (2011) model, is that the arrow pattern moves through three *'quadrants'* in anti-clockwise directions. Buckminster Fuller (Cates, 2015) states *"unity is plural and has a minimum two, a concave and a convex, experience is a plurality of events"* he continues: *"three points/gears (concept) get stuck"*. Two or four '*gears*' *(experience) provide* positive or negative *'energy events'* (Fig. 4.4, p.94); two for feedback and two for feedforward. *'Gearing'* offers a deeper understanding of Trafford and Leshem's *'quadrants'*, congruence between conceptual and experiential realities, *'gears'* bring a more tangible understanding of how I think and learn: synergy in *'real-time'*.

My immediate interest is what better appreciating quadrant A means for this research and my doctoral journey, particularly what this means for evaluating autoethnography through potentially positivist criteria. Jahn and Byrne (2001) who inform Kerr and Key's (2011) model (Fig. 4.20, p.120) offer more discussion on mind-matter interactions, Jahn and Byrne (2007, p.318) discuss *'the source'*. Fig. 4.21 offers models for me to consider placing myself as a source in both this thesis; and in viva discussions where the unconscious bias may be at play. Jahn and Byrne (2007, p.319) suggest the influence of the *'source'* needs to be *"confronted and assessed"*. As a pracademic, I confront myself as a *'source'* by placing myself as (d) in Fig. 4.21.
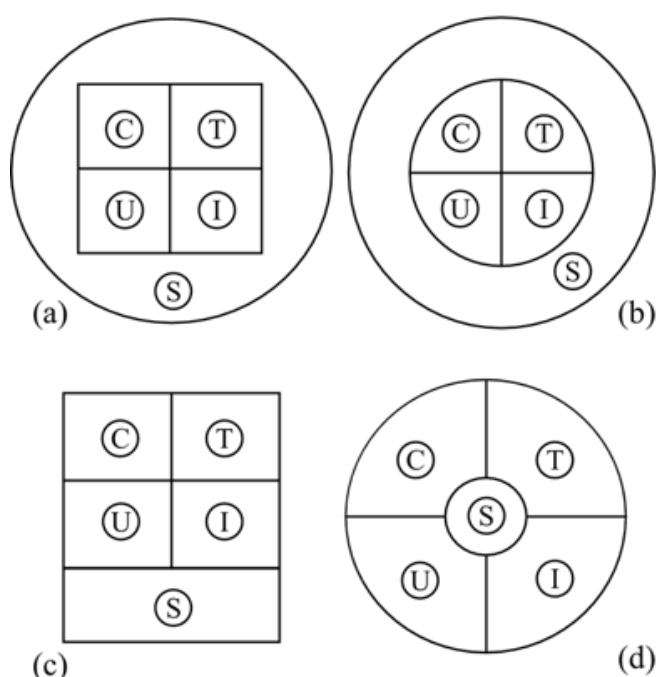
Figure 4.21 – Modular Structures with the Source (Jahn and Byrne, 2007, p.319).

Acknowledging the *'source'* is important, thinking back to *'Maslow/ McDermid's'* pyramid model (Fig. 4.16, p.117), to Dewey's (Fig. 4.18, p.118) and Kolb's model (Fig. 4.19, p.119); they all lack a *'source'*: they are limited as models, as artefacts they offer little to address practical problems (Fig. 4.13, p.105). A technical education should have a greater focus on the *'science of design'* (Simon, 1996, p.138), it is from my pragmatic analysis of experiential models flaws in my built environment education become apparent: dissonance between theory and practice. As staff we use experiential models, we may not sufficiently understand the *'science'* underpinning them. We can interpret them incorrectly through *'folk knowledge'* in how it was put to us, which we can then pass on to our students if not careful, who need to establish their own *'source'*. As a student, I have had classes where they have been presented, but never really appreciated the value or thinking behind such models. Within my doctoral journey I have wrestled with trying to understand my thinking through models, it has been *'quadrants'* that has helped me to do this.

In danger of losing myself with *'quadrants'*, there is something in quadrant A, an *'itch'* to scratch; it is a *'re-imagination itch'* I cannot ignore, but I will re-visit this in chapter 5 because I want to come back to andragogy. Andragogy offers useful *'tools'* to help learners navigate different periods of a lifelong journey. Knowles et al (2015, p.6) provide six core principles for adult learning but suggest they are *"incomplete in terms of learning decisions"*. For me Fig. 4.22 is a *'tool'*; an *'instantiation'* to mould conversations with myself and characters in chapters 5 and 6.
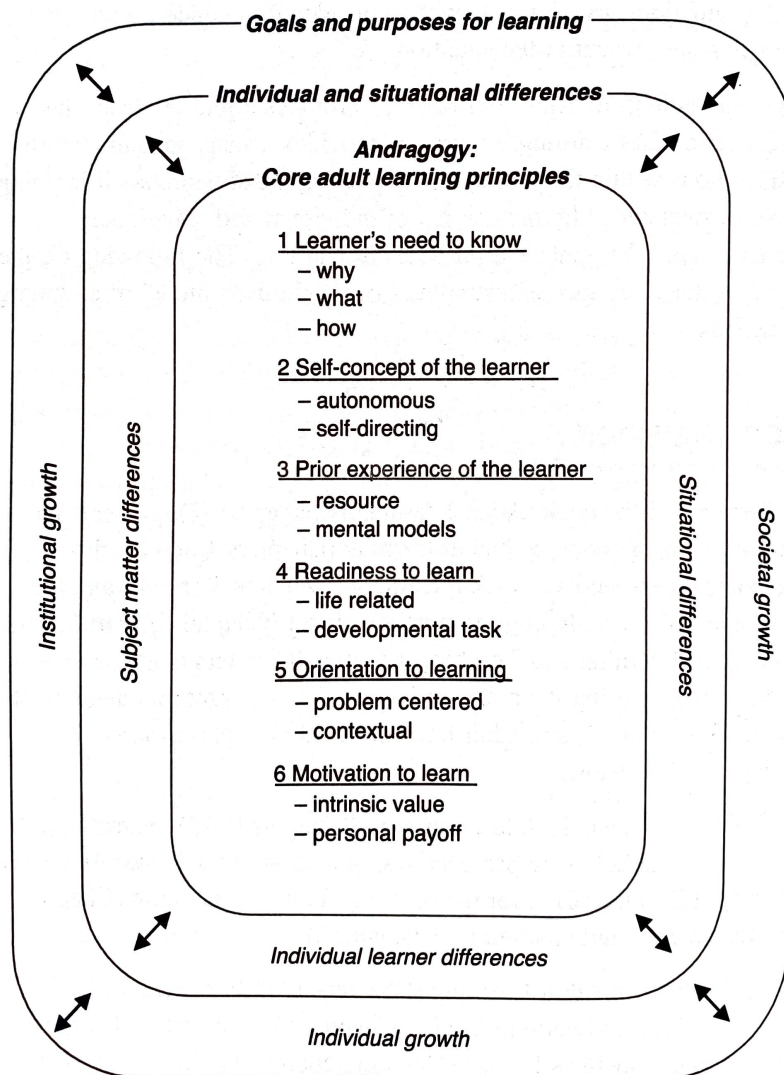
Figure 4.22 – Andragogy in Practice. (Knowles et al, 2015, p.6).

The core principles offer a framework to cater for all student types entering built environment education, to re-visit them during the process and at the end of a period of learning. Fig. 4.22 itself is scalable, it offers context; as you grow so does *'mastery of the tool'*, a greater awareness develops; it is instinctive, becomes more intuitive as your knowledge develops with it. Looking at Kolb's model (Fig. 4.19, p.119) it is Fig. 4.22 that offers greater synergies with theory; it has keys to unlock you, which I will explore autoethnographically in chapters 5 and 6 within the context of my *'lived experiences'*.

Fig. 4.22 (p.122) offers *'genuine utility'* (Harland, 2012, p.58) as a theoretical and conceptual model to build upon in my view. Its basic tenets helping open up my thinking, taking me to a place **'where'** a greater awareness of my learning began; a *'point of origin'*, which I will re-visit in chapter 5 in the context of my experiences within built environment education. But what Fig. 4.22 (p.122) lacks is explicit reference to **'who, where and when'**; as learners and *'scaffolders'* we need a more explicit conversation to go with **'why, what and how'** we learn. **'Who'** impacts our learning? **'Where'** and **'when'** do we think and learn, which are two different things; I think about my learning mainly when with others, but I learn about my thinking when I reflect mainly on my own.

Fig. 4.22 (p.122) offers connection to Montessori; Knowles focused on adult education, but the model could be used for all stages of education. Montessori is synonymous with early years education, she offers no conceptual model, which is a good thing I can make my own, the *'age-bound planes of development'* are limiting (Fig. 4.15, p.114); but a marriage with Knowles and andragogy offers ideas to explore. From a growing interest and reading more about Montessori, the impression left with her method being focused on *'three inter-related components'* is that it is lifelong. You get no sense of ego from reading her, or in accounts of her, if anything you get a sense of jealousy and resentment towards her (Kilpatrick, 1914); there is also a sign of a quiet admiration from the many male theorists who have followed and critiqued to re-gurgitate her ideas. Thinking of Heseltine's (BBC, 2016) romantic idea of *'all-through'* education linked to the UK's industrial strategy, Montessori offers food-for-thought to re-imagine, Montessori (2007) states:

> *"If the 'formation of man' becomes the basis of education, then the coordination of all schools from infancy to maturity, from nursery to university, arises as a first necessity: for man is a unity, an individuality that passes through interdependent phases of development. Each preceding phase prepares the one that follows, forms its base, and nurtures the energies that urge towards the succeeding period of life."*

Hirsch (2016, p.196) states *'education is inherently an induction into the adult tribe'*, the professional focus of built environment education, its disciplinary *'tribal'* education can be limiting and confused. It can inhibit delivery of a true holistic education for learners of a similar mindset to myself, particularly at tertiary level. Since working as a pracademic I have come to realise something through my doctoral journey, I cannot recollect being taught the theory that underpins my built environment education; there has never been an explicit conversation about pedagogy or *'andragogy'* that informs how I will be learning. Sharples (2019) suggests pedagogy can be ignored, he states *"pedagogy is something teachers do, but don't generally talk about"*; this needs to be extended to *'andragogy'*. Between Knowles and Montessori are two theorists to support a conversation, a lifelong conversation to deliver insights. As I continue with autoethnography in chapters 5 and 6, exploring pedagogy and andragogy can offer me a better understanding of the *'mechanics'* of my education.

Chapter reflections and insights

The thematic framework from chapter 3 (Fig. 3.30, p.88) has been expanded upon within Fig. 4.23 (p.125), with additional reflection points provided. RO1 and RO2 share a close relationship in many aspects (Fig. 4.23, p.125), they have been focused on particularly in this chapter, realisation of them still needs developing but in the context of chapters 5 and 6. RO1 has helped scaffold the *'conversation'* in this chapter, both to realise itself and support RO2. RO1 both benefits from Fig. 3.30 (p.88) help refining the *'conversation'* in this chapter, a focus on cybernetics, synergetics and design science brings *'art and science'* together to help monitor and inform my own use of autoethnography (RO1.2/3). It offers a way to systematise autoethnographic *'conversations'* in chapters 5 and 6, without influencing the content to come from the characters themselves.

Fig. 4.23 (p.125) outlines this investigation faces a wicked problem (RO1.1), it has to be acknowledged a global pandemic could influence recommendations, teaching practices are changing rapidly. However, explicitly using my research objectives to make my contribution to knowledge and practice reduces the impact of this (Fig. 4.1, p.89). A focus on andragogy, humanism and experiential learning is a *'conversation'* to continue within chapters 5 and 6 (RO1.5). The relationship between academia and industry brings into focus the importance of learning environments (RO1.6). RO2 (Fig. 4.23, p.125) benefits from RO1 in the way that the literature has been orientated towards achieving *'goals'*, helping iterate and simplify the way forward. 5W & 1H questions in a synergetics *'conversation'*, cybernetics offers a goal-orientated focus and design science informs my understanding of evaluating *'artefacts'* (RO2.1/3/5). In discussing knowledge and skills, folk knowledge and pedagogy has been outlined (RO2.4), the impact of which will be incorporated into chapters 5 and 6. Discussing humanism and experiential learning models (RO2.2) has helped to focus, or orientate, an emphasis on the design of learning and teaching (RO2.6); Montessori and Knowles particularly offer ideas to inform the autoethnographic *'conversation'* moving forward with into chapters 5 and 6.

In order to *'connect-the-dots'* with chapter 3, RO3 and RO4 need more attention; RO3 particularly needs to develop upon the personal insights offered in chapter 3. RO4 with its focus on graduate attributes and *'output theory'* has been briefly discussed more as *'artefact of output'* (RO4.1), with theory thought of more as conjecture or postulate than hypothesis. Knowledge types/forms and skills has been explored, but through Design Science which is more explicit than autoethnographic literature (RO4.2). Modularisation and assessment types explicit to built environment courses have not been discussed, an area to re-visit in chapters 5 and 6 (RO3.1/ 2); this is where I can explore how I have been assessed at different times, by analysing my own assignments and coursework.
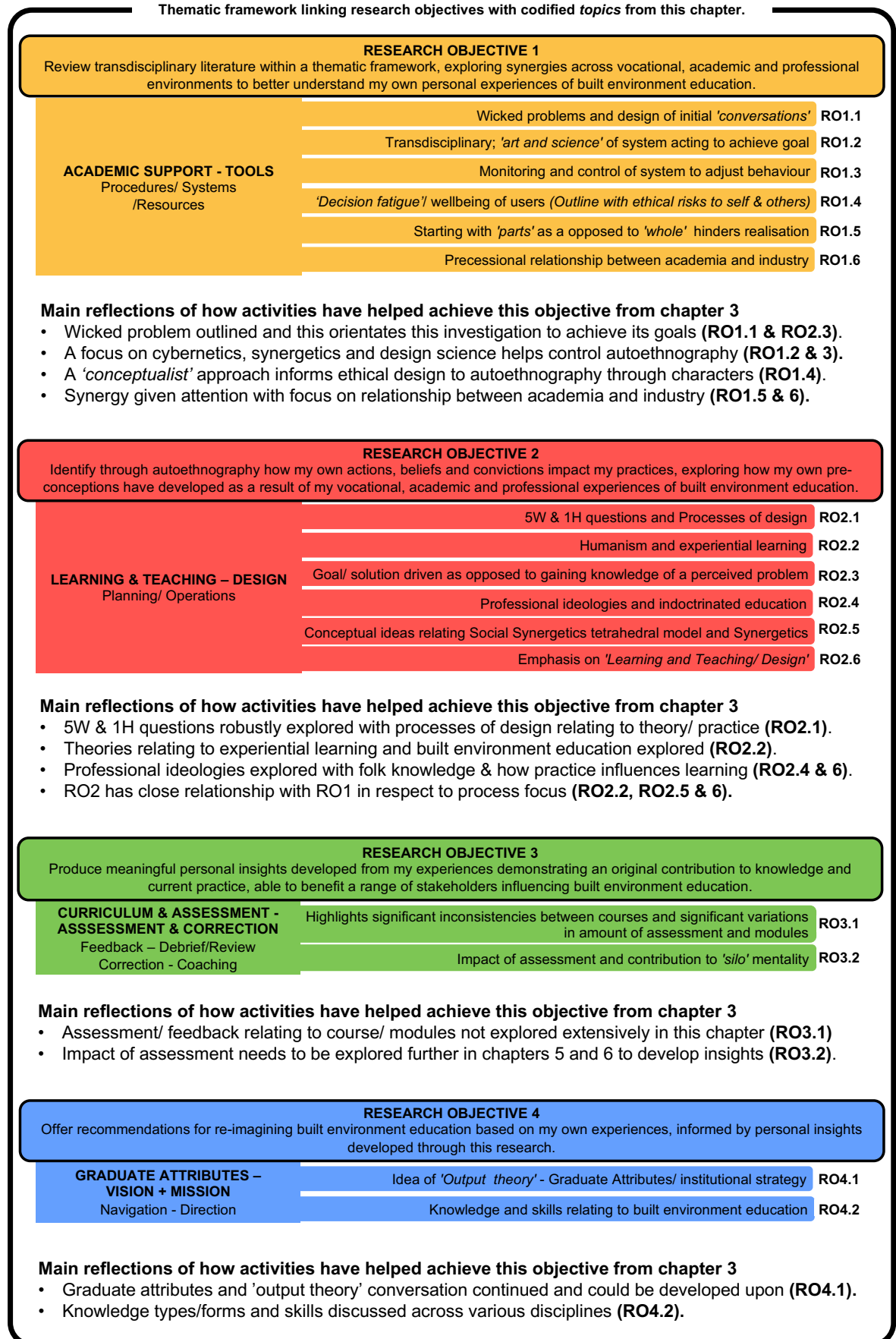
Thematic framework linking research objectives with codified *topics* from this chapter.

RESEARCH OBJECTIVE 1
Review transdisciplinary literature within a thematic framework, exploring synergies across vocational, academic and professional environments to better understand my own personal experiences of built environment education.

ACADEMIC SUPPORT - TOOLS Procedures/ Systems /Resources		
	Wicked problems and design of initial *'conversations'*	**RO1.1**
	Transdisciplinary; *'art and science'* of system acting to achieve goal	**RO1.2**
	Monitoring and control of system to adjust behaviour	**RO1.3**
	'Decision fatigue'/ wellbeing of users *(Outline with ethical risks to self & others)*	**RO1.4**
	Starting with *'parts'* as a opposed to *'whole'* hinders realisation	**RO1.5**
	Precessional relationship between academia and industry	**RO1.6**

Main reflections of how activities have helped achieve this objective from chapter 3
- Wicked problem outlined and this orientates this investigation to achieve its goals **(RO1.1 & RO2.3)**.
- A focus on cybernetics, synergetics and design science helps control autoethnography **(RO1.2 & 3)**.
- A *'conceptualist'* approach informs ethical design to autoethnography through characters **(RO1.4)**.
- Synergy given attention with focus on relationship between academia and industry **(RO1.5 & 6)**.

RESEARCH OBJECTIVE 2
Identify through autoethnography how my own actions, beliefs and convictions impact my practices, exploring how my own pre-conceptions have developed as a result of my vocational, academic and professional experiences of built environment education.

LEARNING & TEACHING – DESIGN Planning/ Operations		
	5W & 1H questions and Processes of design	**RO2.1**
	Humanism and experiential learning	**RO2.2**
	Goal/ solution driven as opposed to gaining knowledge of a perceived problem	**RO2.3**
	Professional ideologies and indoctrinated education	**RO2.4**
	Conceptual ideas relating Social Synergetics tetrahedral model and Synergetics	**RO2.5**
	Emphasis on *'Learning and Teaching/ Design'*	**RO2.6**

Main reflections of how activities have helped achieve this objective from chapter 3
- 5W & 1H questions robustly explored with processes of design relating to theory/ practice **(RO2.1)**.
- Theories relating to experiential learning and built environment education explored **(RO2.2)**.
- Professional ideologies explored with folk knowledge & how practice influences learning **(RO2.4 & 6)**.
- RO2 has close relationship with RO1 in respect to process focus **(RO2.2, RO2.5 & 6)**.

RESEARCH OBJECTIVE 3
Produce meaningful personal insights developed from my experiences demonstrating an original contribution to knowledge and current practice, able to benefit a range of stakeholders influencing built environment education.

CURRICULUM & ASSESSMENT - ASSSESSMENT & CORRECTION Feedback – Debrief/Review Correction - Coaching		
	Highlights significant inconsistencies between courses and significant variations in amount of assessment and modules	**RO3.1**
	Impact of assessment and contribution to *'silo'* mentality	**RO3.2**

Main reflections of how activities have helped achieve this objective from chapter 3
- Assessment/ feedback relating to course/ modules not explored extensively in this chapter **(RO3.1)**
- Impact of assessment needs to be explored further in chapters 5 and 6 to develop insights **(RO3.2)**.

RESEARCH OBJECTIVE 4
Offer recommendations for re-imagining built environment education based on my own experiences, informed by personal insights developed through this research.

GRADUATE ATTRIBUTES – VISION + MISSION Navigation - Direction		
	Idea of *'Output theory'* - Graduate Attributes/ institutional strategy	**RO4.1**
	Knowledge and skills relating to built environment education	**RO4.2**

Main reflections of how activities have helped achieve this objective from chapter 3
- Graduate attributes and 'output theory' conversation continued and could be developed upon **(RO4.1).**
- Knowledge types/forms and skills discussed across various disciplines **(RO4.2).**

Figure 4.23 – Summary of main reflections in response to thematic framework from chapter 3. (By author).

This chapter has informed me *'how'* to simplify the *'conversation'* from chapter 3, Fig. 3.30 (p.88) has been a useful tool to explore the literature; going into chapters 5 and 6, a simpler systematised framework is required to showcase my personal insights. From the analysis of experiential models within this chapter, it would be easy to fall into the trap of developing my own now to take the *'conversation'* forward. This in my view would be a distraction at this stage for the following two autoethnographic chapters, therefore I will refrain from doing this now, I want the story to still evolve naturally; I will bring the various threads together through chapters 5 and 6, more so in chapter 7 as I conclude this investigation and have an eye on recommendations in chapter 8.

So, moving forward my initial focus is on the six coloured relationships in Fig. 4.24, which draws on a *'conversation'* that develops from Fig. 4.9 (p.98); it does not attempt to influence the unfolding story itself, just help systematise my writing. I am particularly focused on the **Action** *(beginning)*, **Reaction** *(middle)* and **Resultant** *(end)*, and the positive and negative energy events outlined in Fig. 4.4 (p.94); using them to construct sub-headings to consider how to creatively navigate through various types of data I have, but that importantly draws from the story and themes already developed in the first half of this research.
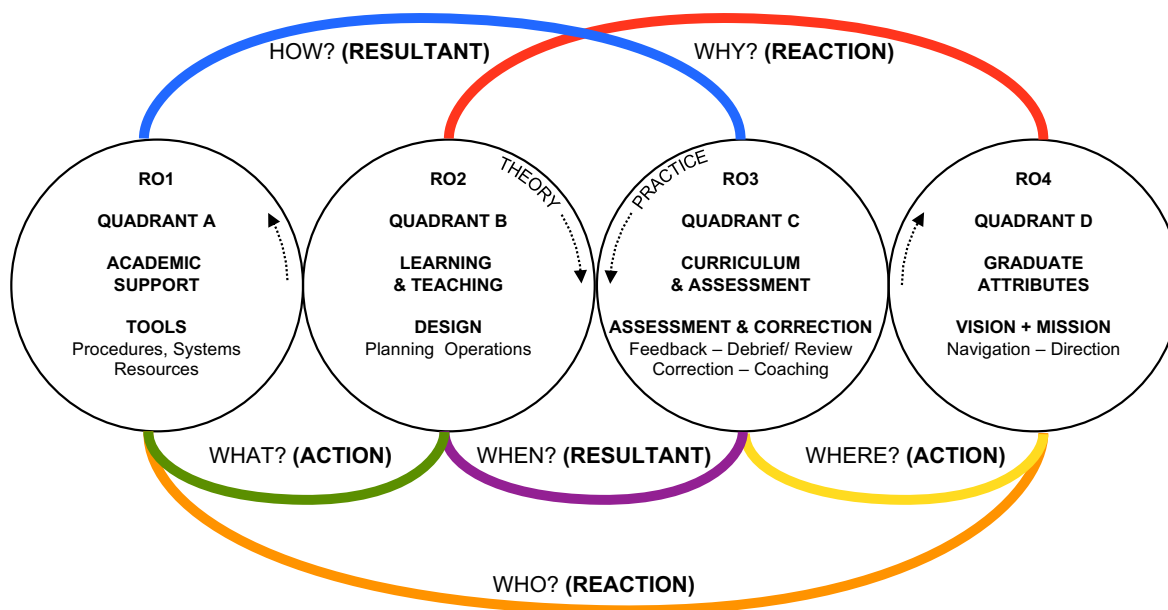

Figure 4.24 – A 'conversational' framework to help systematise autoethnography in chapters 5 and 6. (By author, informed by Fig. 4.9, p.98).

Chapter 5 – Focusing on Theory in my *'Black Box'*

This autoethnographic chapter utilises Fig. 4.24 (p.126), to provide a structure for a series of *'events'* within one story (Fig. 5.1). As the pracademic (Fig. 1.3, p.13) I am talking to you directly, in a period of lockdown due to the coronavirus pandemic. This chapter re-visits some of the period covered in chapter 3, but as part of a *'conversation'* covering different periods of built environment education. A particular emphasis in this chapter is on exploring educational theory in the context of my personal experience, of what curriculum can mean, of how learning programmes can be sufficiently flexible when our circumstances change. This chapter begins to examine the *'mechanics'* of different periods of my built environment education, some of the elements not fully appreciated as a student are reflexively explored from my *'pracademic'* viewpoint. The aim of this chapter is to provide the basis of the *'conversation'* going into chapter 6, one with multiple characters present.

Fig. 5.1 does not control *'event'* content, it just directs us through a beginning *(Reaction)*, middle *(Action)* and end *(Resultant)*. There is a relationship between those in the analysis series of events, and those in the synthesis series, for example, the analysis *'reaction'* also informs the synthesis *'reaction'* (feedback/ feedforward). Each *'event'* is signposted with a coloured *'dot'* referring to Fig. 5.1, to help *'connect-the-dots'*. Within the analysis series of *'events'* I am more focused on my *'thinking gain*, in the synthesis series it is on my *'learning gain'*; I am trying to demonstrate that I do these at different times in reality.
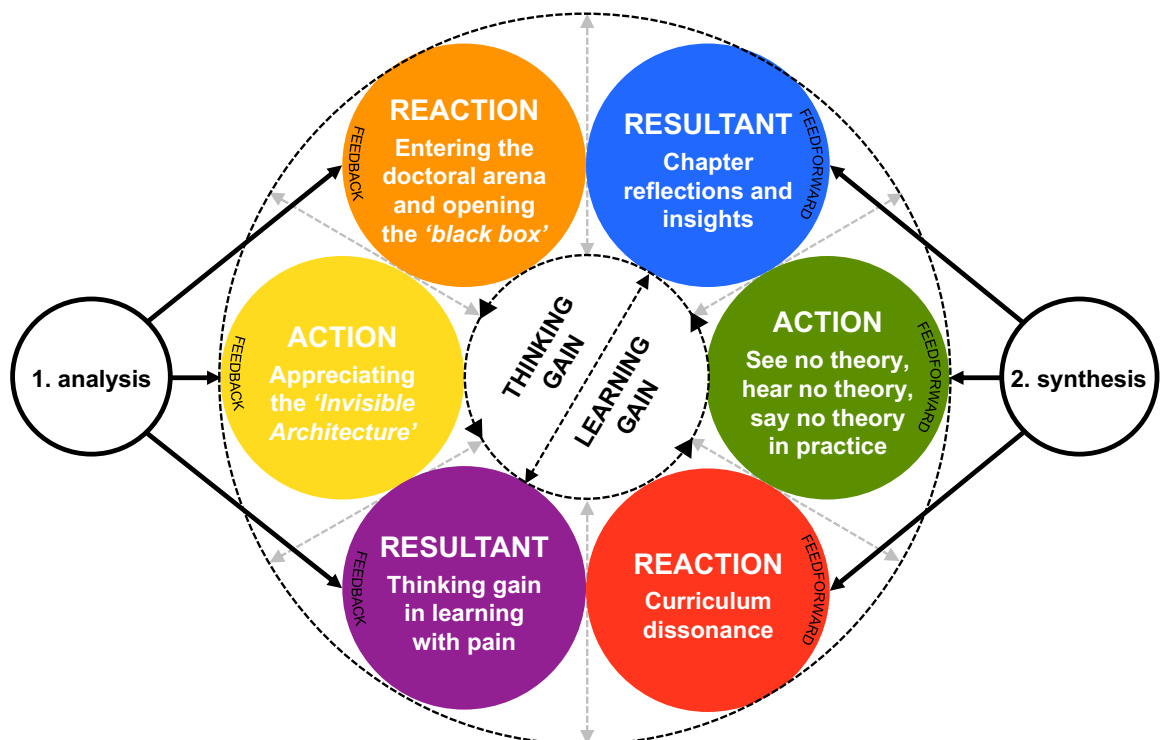

Figure 5.1 – Systematising stories within a story to bring analysis and synthesis together. (By author).

● **Entering the doctoral arena and opening the *'black box'***

I've been in this box in *'lockdown'* for weeks, staring through screens on my desk trying to be a *'digital native'* but I'm nearer the *'silver surfer'* category. I've been waiting for this day, a day I feel ready to write this chapter; it's also my birthday. Some early presents kickstart my day, Louis Theroux's rather aptly named book, *"Gotta Get Theroux This: My Life and Strange Times in Television"*; a title I could adapt as I delve further into my life and strange times in built environment education. The other gift is Romney's Kendal mint cake: *lovely ol job!* Birthday cards remind me I'm awesome, a sexy beast, and like a fine wine; *cheeky!* We re-live my Fortnite initiation, which unbeknown to me was put on YouTube (Shock Crim, 2020) a few days previous. We laugh that somehow, I don't feature in the video; a timely reminder that despite having clear learning outcomes, we sometimes forget the learner in the process of learning.

The texts roll in whilst making my way to do the weekly ritual of lockdown *'click+collect'* shopping; the radio plays Powfu – death bed *(a cup of coffee for my head)*. I'm home again but have to dash out; my Fortnite teacher needs to do their own *'lockdown learning'* at school. Now we're here, it's just you, me and this other guy; the *'researcher-self',* in this *'black box'* (Fig. 5.2). My Gorg brings a *'coffee for my head'*: its 10am. Ok let's crack on.

Figure 5.2 – My black box (Photograph by author).

Muncey (2005) inspires a re-visit to old school reports, those artefacts offering insight into a rich tapestry of over 30 years' worth of experiences; those interwoven into the DNA of who we become. I compare two reports (Table 5.1, p.129) when I first started at high school in 1988, more jokes at my expense, but at the age of 13 there's some insights to help me begin *'connecting-the-dots'* and continue to profile myself as a learner.

I seem like an ok student, in some subjects I got better and some I didn't, my attendance fell. I could produce work, when it suited or interested me, write with *'pleasing flair'*, produce *'work of the highest standard'* in Physics and CDT, be *'mature and self-disciplined'* in Chemistry. Yet in Art despite an improved grade my work was *'bad or not particularly well done'!* Evaluation through tests or exams appears an issue. I displayed *'characteristics of care and friendliness'*, but *'need to take more care in my technical accuracy'* so I *'must listen to my work more carefully'* as my music teacher suggests. Summarising Table 5.1 (p.129) examinations bother me, still do; I was capable, but not disciplined and mature enough; feedback and assessment aren't always consistent with each other; subject relevance and learning environment matter. I'm a bundle of energy.

Table 5.1 – Attendance, grades and feedback from two high school reports (first year).

		Autumn Term 1988 (Attendance 66/66)	Summer Term 1989 (Attendance 50/72)	
C	**Maths:** *Leon can be rather chatty and silly in class but on the whole his work is satisfactory and completed on time.*		**Maths:** *Leon tends to be easily distracted, which I feel is the reason for his, only passable exam result.* **With better exam preparation and concentration in class, this could be greatly improved**	**D-** Exam C
C+	**English:** *Leon participates very well in class discussion (though he needs to remember to put his hand up!).* **There is a pleasing flair to his written work though he needs to take more care with technical accuracy.**		**English & Lit:** **Leon makes a very good contribution to class discussion and his understanding is good.** *His written work and homework are usually barely completed, and he has difficulty in this area*	**C** Exam D
B	**Physics:** *Some good work this term.*		**Physics:** **At his best, his work is of the highest standard, but he must control his inclination to mess about.**	**B**
C	**Chemistry:** *Leon is enthusiastic and works hard in practical sessions.* **However, his written work needs more detail.**		**Chemistry:** *I have been pleased with Leon's enthusiasm and interest during the year.* **He is keen to work, mature and self-disciplined** *consequently his term grades have been consistently good*	**C+**
B	**Biology:** *Leon takes some time to settle down but works well when he has done so.* **Written work quite good.**		**Biology:** *Leon has passed 2 of the 3 'foundation' tests in the topics completed in this year. He has gained good levels in the various assessments – a steady year's work*	**C**
C	**History:** *Good written work and some useful oral contributions but the* **test result was disappointing.**		**History:** **The test result was a little disappointing,** *Leon ran out of time. He could expect success on a GCSE course.*	**C** Exam C
B	**Geography:** *An encouraging start*		**Geography:** *Leon worked steadily and with interest and his class work is good.* **However, his exam result revealed several gaps in knowledge**	**D-** Exam D
B+	**French:** *good. Leon participates well in class discussion and has presented some good written work.* **Leon can produce good written work. He needs to concentrate on it all the time.**		**French:** **Leon is capable of producing some good work but does not usually give his best.** *Leon always gives the impression, orally, that he is coping well with the course. Unfortunately, however it's not reflected in his written work. His general behaviour in class is not always acceptable.*	**C** Exam D
C	**Music:** **Leon must try to 'listen' to his work more carefully**		**Music:** *Leon can produce sensible results when he concentrates for long enough*	**C**
C-	**Art:** *Leon hasn't done the required amount of work in class or at home. He has produced one good plant study and he obviously enjoyed doing portraits.*		**Art:** **This is a low 'C' due to the amount of work in Leon's folder which is bad or not particularly well done.** *His painted portrait and plant paintings is 'A' quality. I wonder if he has always put his full effort into his work. If he did his work would have been better all round.*	**C**
C	**CDT:** *Leon has potential and I detect some improvement in his presentation.*		**CDT:** *Marks which Leon has got for his assignments vary from 10% to 90%.* **He is obviously capable of high attainment – but only when he feels like it!**	**B**
C+	**Home Economics:** *I am pleased with the progress Leon is making in this subject. The standard of his practical work is good.*		**Home Economics:** *There has been a slight improvement in Leon's attitude to work.* **However, he needs to adapt a more positive and concentrated approach to all of his work**	**D** Exam E
B	**P.E.:** *A lively and cheerful member of the form Leon has made pleasing progress in this subject in which he has shown keen interest*		**P.E.:** *A satisfactory years work from Leon who has fair all-round ability in this subject.*	**C**

Form Tutor: **Leon has a bubbly personality. Underneath is a person who shows characteristics of care and friendliness**

Year Tutor: **Leon has ability to do well but these reports reflect his inability to concentrate and work at capacity. He will need to rectify this next year to be successful in exam courses.**

The real benefit of my *'black box'* is being able to time-travel, whilst sitting still. I grab Buckminster Fuller (2010) *'Education Automation: Comprehensive Learning for Emergent Humanity'*, a lighter introduction to Bucky and Synergetics; the rich and colourful life of Bucky illuminates, my eyes listening to the many words, quotes and stories; like this for example:

> *"I am quite confident that I can say with authority that Einstein, when he wanted to study, didn't sit in the middle of a schoolroom. That is probably the poorest place he could have gone to study. When individuals are really thinking, they are tremendously isolated".*
>
> (Buckminster Fuller, 2010, p.62)

This quote connects me to school not being my place to learn and autoethnography, it has its critics but there's a benefit to being *'tremendously isolated'* in my *'black box'* exploring the last 30 years or so. Table 5.1 (p.129) represents the start of a journey, one highlighting an underlying anxiety about how I'm assessed by others; how value judgements can impact more than just periods of study; that environment matters. I've become more consciously aware of this anxiety during my doctoral journey, leading me to question most of my built environment education.

I *'leap'* to the beginning of my doctoral journey; not enrolled, just a guest invited to attend. The learning environment is a buzz, many different subjects explored, an engaging and inclusive community of people. I'm hooked and have my first encounter with Trafford and Leshem's (2008) *'stepping stones'*, a purchase that leads me to *'the end is where we start from'*. Harland (2012) helped me *'swim'* in academia; Trafford and Leshem (2008) have helped elevate my thinking. It's through exploring *'quadrants'* and the road to *'demonstrating doctorateness',* that ideas to re-imagine built environment education *'swim round'*; in turn a greater understanding of my own *'graduateness'* ensues.

From Trafford and Leshem (2008, p.18-21) came my fascination with questions in doctoral vivas that *'follow certain patterns'*, unhealthily so they've occupied my thoughts. Thinking of a viva as an exam concerns me, because at 13 I was useless at them Table 5.1 (p.129); however, as a *'conversation'* it opens me up. I think that *'the end is where we start from'* is under-appreciated, that the *'output'* is not given enough attention at the beginning; that a key *'input'* is missing in the *'conversation'*; the learner. It's through an early connection with Trafford and Leshem's (2008) *'quadrants'* I've come to appreciate that when designing learning experiences, you have to design with, not for learners, otherwise you end up with experiences like mine with my Fortnite teacher. In Trafford and Leshem (2008) is a source to unlock the geometry of how I think and see patterns, entering the doctoral arena the lid on my *'black box'* is opening up; if the *'the end is where we start from'* we would be in the dark on this occasion.

130

In *'demonstrating doctorateness'* (Trafford and Leshem, 2008), my focus is still on *'graduate attributes'*; the *'aspirational artefact of output'* to better understand parts of my own self-transformation. Transformation project themes (Fig. 3.1, p.49) informed my connection to *'quadrants'*; why transformation project themes? As a learner I feel you're both a conduit to realising the success of a designed experience and an artefact of it; *'an artefact of output'*. Treading an unorthodox path with my built environment education, only at doctoral level have I come to really appreciate *'what the end looks like'*. The QAA (2014) offers a clear framework to help an overactive thinker, and serves as a good precedent of what was missing at other levels to which I question; how do institutions actually know what they do makes a difference to learners?

A brief account of *'quadrants'* is to underpin how it unlocks other *'light-bulb'* moments as we progress. *'Re-living'* epiphanies feels odd, re-writing them lacks the same surprise and wonder; labelling them into Denzin's (2014, p.52) *'forms'* feels futile. It feels like completing assignments after the experience itself, energy dwindles in me quickly; creating dissonance in how I reason with myself, it goes against the grain.
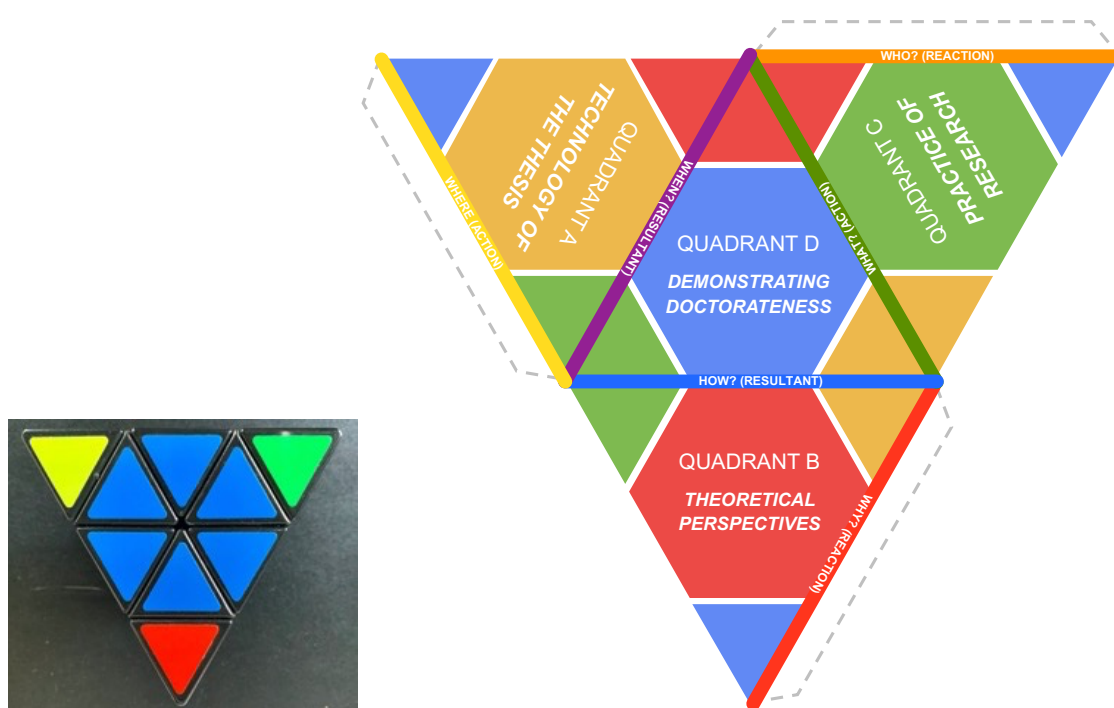

Figure 5.3 – Pyramix-inspired 'quadrants' and tetrahedral model. (Photograph by author, informed by Trafford and Leshem, 2008 and Buckminster Fuller, 1979).

In my desire to understand my own self-transformation *'quadrants'* consume me, I'm looking to systematise them; explore thinking behind them. Other artefacts help pattern-forming, I'm sucking in data in many forms; physical objects like Pyramix (Fig. 5.3) for example. My primary focus is to conceptualise and systematise the themes; whilst seeking an artefact to simplify learning experiences: frustration bubbling within me.

Frustration bubbles, *"tension between both my insider and outsider perspectives"* (Reed-Danahay, 2009). The immediacy of my *'multiversal perspectives'* puts me in a quandary; as a graduate comes a curiosity to better understand my transformation; but as a *'pracademic'* I'm starting to gain a greater insight into an environment that brings out conflict in me. I want to provide a learning experience that elevates the thinking of future professionals, yet I feel like we design for school kids. We undervalue prior knowledge and skills of adult learners, make value judgements about them no different to what school teachers did with me (Table 5.1, p.129); we're *'too pedagogical'* which I'll come to. As a graduate looking in, conflict within me builds, I'm quietly thinking what are we doing guys? As a pracademic, despite nearly 30 years in industry, my journals continually highlight being thought of as junior and that it grates with me getting talked down to by disciplinary dogmatists. There's innovation and imagination, it's in here, I can see a spark in others; individuals left frustrated because it's not transferring through to a disparate and siloed collective. A journal entry at the time reminds me:

"People don't like change because they have no time to implement it"

Lack of time is a factor, but there's a real collective resistance to change; I empathise with other innovative individuals craving it. I just feel lucky to have a front-row seat; however, it's also driving a reaction to change what I see, a reaction I must acknowledge developed long before being immersed in a working academic culture; as a student and from practice. It could be deep-rooted, stem back to school experiences as a 13 years old; knowing that how we measure or assess is lacking an important initial *'conversation'* to prepare and understand the learner themselves.

I need to move on, seek solace in my own little world, my thoughts are with *'marginal gains'* (Syed, 2016) and *'stepping stones'* (Trafford and Leshem, 2008). I'll take *'naval-gazer'* (Denzin, 2014, p.70) as a criticism, it's a compliment to a graduate with *'tools'* to challenge and question: besides what was Einstein's go-to method, thought experiments wasn't it? (Issacson, 2007, p.114). Who would have thought research offering '*little fieldwork' (30 years' worth)*, using *'small, biased data samples' (30 years' worth)* to conduct *'naval gazing'* through imagination and personal experiences would have such an impact? I've never really *'naval gazed'* with intention; it's a novel experience.

'Quadrants' aid exploration of my conceptual ideas; a release from the realms of disciplinary dogma. With the journal entry *(above)* is a note *'Synergetics and tetrahedrons' – simplify and systematise to better understand quadrants'.* Pyramix (Fig. 5.3, p.131) inspires the *'quadrants'* within an *'unfolded'* tetrahedral form, my pursuit of the *'invisible architecture'* begins; we'll pick up this *'conversation'* when we get to the 🟡.

School reports, exploring different periods of my built environment education and working in academia, bring me to question the design of some of my learning experiences; it's led to a real scepticism of curriculum. I'll focus on undergraduate level, both a convergent *(child)* and divergent *(adult)* point between secondary and tertiary education for many students; the use of pedagogy interests me, it appears a default term used generally for all education in my experience. Fig. 5.4 outlines *'the three gogies'*; an adapted representation from Heick (2020).

	Pedagogy Children's Learning	**Andragogy** Adults Learning	**Heutagogy** Self-determined Learning
Dependence	The learner is a dependent personality. Teacher determines what, how and when anything is learned.	Adults are independent they strive for autonomy and self-direction in learning.	Learners are interdependent. They identify the potential to learn from novel experiences as a matter of course. They are able to manage their own learning.
Resources for learning	The learner has few resources – the teacher devise transmission techniques to store knowledge in the learner's head.	Adults use their own and other's experience.	Teacher provides some resources, but the learner decides the path by negotiating the learning.
Reasons for learning	Learn in order to advance to the next stage.	Learn in order to advance to the next stage. Adults learn when they experience a need to perform more effectively.	Learning is not necessarily planned or linear. Learning is not necessarily based on need but on the identification of the potential to learn novel situations.
Focus for learning	Learning is subject focussed on prescribed curriculum and planned sequences according to logic of the subject matter.	Motivation stems from internal sources-the increased self-esteem, confidence and recognition that comes from successful performance.	Learning can go beyond problem solving by enabling pro-activity. Learners use their own and other's experiences and internal processes such as reflection, environment scanning, experience, interaction with others, and pro-active as well as problem-solving behaviours
Motivation	Motivation comes from external sources – usually parents, teachers and a sense of competition.	Motivation stems from internal sources-the increased self-esteem, confidence and recognition that comes from successful performance.	Self-efficacy, knowing how to learn, creativity, ability to use these qualities in novel as well as familiar situations and working with others.
Role of teacher	Designs the learning process, imposes material, is assumed to know best.	Enabler or facilitator, climate of collaboration, respect and openness.	Develop the learners' capability. Capable people: Know how to learn Are creative Have a high degree of self-efficacy Apply competencies in novel as well as familiar situations Can work well with others

Figure 5.4 – 'Three gogies': the difference between Pedagogy, Andragogy and Heutagogy. (Adapted by author from Heick, 2020).

When speaking to students about the transition to university from school, college, or work I have often put up a slide of Fig. 5.4 (p.133) early on. To highlight their responsibility as learners, link previous experiences to the road ahead and give some indication of growth working towards being graduates. It's also to define my role with them, that I'll help their transition to be more capable learners; it's a slide that re-surfaces on various occasions to jog their memories.

What Fig. 5.4 (p.133) encapsulates, reflecting on my experiences, is that built environment education is too *'pedagogical'* at many levels; It's one example I accept, but it reflects what I see and only come to appreciate at doctoral level. How many academics can honestly say their teaching is predominately andragogical, or even heutagogical? I can't unfortunately, not for the want of trying, and not necessarily the fault of students in my view; how many staff have even heard of andragogy and heutagogy? Is this a design or mentality issue? I see it as another indicator that there's a lack of appreciation of what the *'artefact of output'* should look like.

All of my built environment education has been as an adult, most of it possibly designed too *'pedagogically'*. I'll refer to Fig. 5.4 (p.133): staff determine learning; who devise complicated and unnecessary strategies to transmit knowledge; students looking to advance may lack experience of practice; a curriculum is prescribed and subject-focused, meaning motivation to learn is still left with staff; who've designed the process, provided material and determined that what they provide is the best way to learn. I don't think it's rocket science to see why students are perceived as not being *'independent learners'* or *'critical thinkers'*. If you design pedagogically you're likely to have adults learning as kids; likely to get a lack of inquiry from the *'artefacts'* by design. For me it's an issue, because on reflection I don't feel I was even taught right as a child at school.

The last point in Fig. 5.4 (p.133) with pedagogy and the role of the teacher who; *"designs the learning process, imposes material, is assumed to know best"*, niggles me personally. Academia can be challenging and confusing for academics and students alike (Harland, 2012, p.90-91). Whilst a focus early in my doctoral journey was on the relationship between institutional strategy and curriculum design, my scepticism of curriculum itself has become another area of friction and frustration; my awareness of *'folk pedagogy'* develops and I reflect on its impact. All my built environment education up to doctoral level has been compartmentalised in some form; a *'prescribed and subject-related'* curriculum designed and planned by others. A curriculum as I've always known it creates conflict in me because I feel it impedes learning, makes it too linear, static, providing only an abstract concept of reality. However, my livelihood dictates its use.

Opening the lid on my *'black box'* a little I seek out a few curriculum definitions: Kelly (2009, p.13) states *"its too problematic and complex to try and define curriculum"*. McKernan (2008, p.11) reluctant to present a strict definition of curriculum, offers a range from others, those striking a chord are cherry-picked based on my own experiences:

1. *"All the learning which is planned and guided by the school, whether it is carried on in groups, or individually, inside or outside the school."* (Kerr, 1968)

2. *"A curriculum is an attempt to communicate the essential principles and features of an educational proposal in such a form that is open to critical scrutiny and capable of translation into practice."* (Stenhouse, 1975)

3. *"The total experiences planned for a school or students."* (Wiles and Bondi, 2007)

4. *"Curriculum is often taken to mean a course of study. When we set our imaginations free from the narrow notion that a course of study is a series of textbooks or specific outline of topics to be covered and objectives to be attained, broader more meaningful notions emerge. A curriculum can become one's life course of action. It can mean paths we have followed and the paths we intend to follow. In this broad sense, curriculum can be viewed as a person's life experience."* (Connelly and Clandinin, 1988)

The first three quotes may resonate with many academic staff, students will likely think of curriculum as basically doing whatever you tell me to learn; I did. The view of both staff and students will be informed by prior learning experiences; for built environment education, many staff like myself enter academia from practice and may still be practitioners. With the 3rd quote who should design a curriculum: institution or student? Institutions want credit for *'totality'* of life experiences to show *'learning gain'*; a fallacy in reality if not designed for in partnership. The 4th quote, shouldn't all learning be this way? Lifelong learning reflecting on *'paths we've followed'* and agreeing '*paths we intend to follow'*, the stuff of dreams or a possibility? My doctoral journey provides a precedent of the possible, one that feeds the *'self-as-researcher'* but torments the *'self-as-subject'*, who resides and operates in the first three quotes.

The benefit of being both *'observer and the observed'* is bearing fruit, in chronicling a journey it's in the *'self-as-researcher'* and observation of others that there's a realisation of growth. Growth comes from acknowledging my arrival in the andragogical and heutagogical domain Fig. 5.4 (p.133). Moving deeper into my *'black box'*, conscious there's a need to explicate, to be transparent, I think of '*cognitive dissonance'* and the *'closed-loop behaviour'* residing within built environment education (Syed, 2016). Liberated by *'lockdown learning'*, being immersed in my *'black box'* means my *'multiversal perspectives'* can reflect; both quasi-student and quasi-teacher (Powers, 2017, p.27) seek synergy in folk knowledge. Buoyant by the principle of the 4th quote *(above)*, my viewpoint of curriculum widens to begin re-imagining its purpose.

Lectures are likely to remain central; not my preferred delivery method, I'm too conscious of the *'chalk and talk'*, *'sage-on-stage'* (Bothwell, 2018) and death by PowerPoint. Harland (2012, p.32) outlines two camps regarding lectures; one for it to *'disappear altogether'*, one for it to be *'preserved or enhanced'*. Davies (2016, p.99) states some lecturers:

> *"see teaching as simply transferring knowledge from themselves to their students. Actually, I think all lecturers see it this way sometimes, myself included".*

Favouring the *'enhanced'* Harland (2012) outlines, lectures can provide an opportunity to liberate learners from indoctrinated ideologies, and at times ill-informed folk knowledge.

Much of my built environment education is built on folk-based pedagogy: cascading down from professional bodies through academic institutions and staff, many from practice, to students within an indoctrinated disciplinary framework. I've observed both the good and bad of how curriculum impacts: how I can impact. There's comfort in delivering the same content year-on-year; safe in the knowledge similar questions are also likely to follow. Change unsettles and challenges experience, it dislodges those who crave control and who fear looking stupid, failing, or showing weakness in front of a crowd (Matthews, 2017). There's also discomfort in having to listen to a conundrum of over-intellectualised anecdotes, and ill-applied industry technobabble from yesteryear, clogging brains and quelling curiosity. Just because we are knowledgeable in a profession or industry, it doesn't make us naturally good at teaching it, or that we're good at designing the learning experiences of others.

We need to remind ourselves construction and education are two separate industries; both operate in shaping-shifting societies, rapid technological change: *'in lockdown'*. We're all *'learning-on-our-feet'*, need a simpler framework to exchange knowledge. We need to *'flip-the-lens'* (Tett, 2015, p.242), not just *'classrooms'*; be a little more empathetic in how we collectively impact the learning experience. Reflective practice is central to a folk-based pedagogy, but what does that mean to students learning from *'folks'* whose attitude is *"I learned this way as a student so that's how my students learn"* (Powers, 2017, p.23). Through Powers (2017, p.22) I acknowledge how I may impact:

> *"Folk pedagogies are important to shared beliefs and practices of disciplines, but can produce counter-productive behaviours and flawed beliefs, heightening misalignment between how teachers think students learn and how they actually do learn".*

The *'self-as-researcher'* has gradually over time steered the *'self-as-subject'* away from over-relying on *'tacit knowledge'* (Harland, 2012, p.58). I'm guilty of overusing my experiences at times, mainly in trying to provide what I felt was missing from my own student experiences; a more andragogical, even heutagogical *'conversation'*.

I want to take care not to overcook *'the three gogies'* and think about them too linearly. Patrovani (2018) provides useful diagrams (Fig. 5.5), highlighting differences between *'gogies'* within a continuum. Garnett and O'Beirne (2015, p.140) raise caution with *'continua'* in education stating, *"they can be presumed as being points along the learning journey so that one presumes, wrongly, that the learner moves simply from pedagogy to heutagogy"*. Heutagogy as depicted in Fig. 5.5 looks equally uni-directional as pedagogy, is it learning if the *'conversation'* is all with *'self'*?
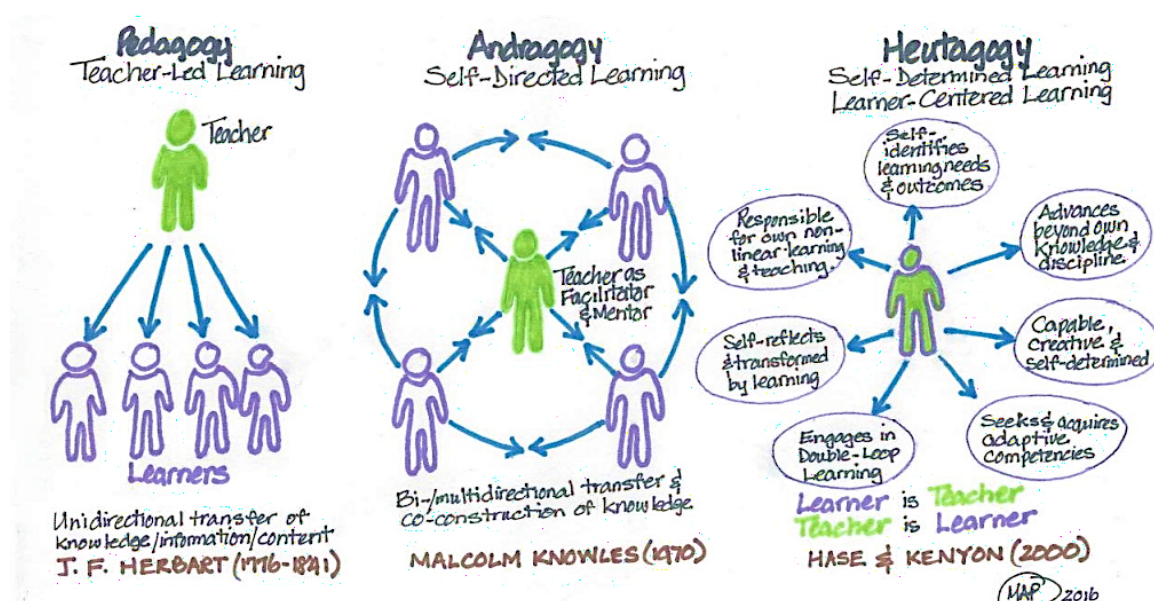
Figure 5.5 – The Pedagogy, Andragogy and Heutagogy (PAH) Continuum. (Patrovani, 2020).

Fig. 5.5 and Fig. 5.4 (p.133) make no reference to heutagogy being an adult endeavour, they refer to *'self-determined learning'*. Hase and Kenyon (2013, p.7) state:

> *"The essence of heutagogy is that in some learning situations, the focus should be on what and how the learner wants to learn, not on what is to be taught"*.

If only I had *'self-determined learning'* at school, could I have become a rocket scientist? Maybe, if my head wasn't filled with being a footballer. Reflecting on what *'built environment'* can offer, I imagine where I could've gone with heutagogy and a curriculum to do it. Much of my formal built environment education has been someone else's thinking, how much did I use in practice? However, I value *'scaffolding'* others provide; the interaction. With the freedom to learn and determining my curriculum, would I have better demonstrated the competence, knowledge and skills required to move into the workplace? Maybe. But I've been lucky, can't complain and feel the richer for it: not financially but that's another story, one in which I empathise with others. A brief exploration into heutagogy requires more andragogical underpinning based on Fig. 5.5, a pragmatic understanding of learning theory helps to see synergies between two industries; with a different perspective of what curriculum can be, the ● will explore educational theory a little further.

● Appreciating the *'Invisible Architecture'*

You might view *'invisible architecture'* as nonsense and dismiss it. Whilst in my *'black box lockdown'* my thoughts are with educational environments. Julian Treasure (2012) presents a TED talk on '*Why architects need to use their ears'* and states:

> *"Invisible architecture was not about appearance but experience. Spaces that sound as good as they look, that are fit for purpose, that improve the quality of life, our health and wellbeing, our social behaviour and our productivity."*

My ears are tuned in, and I'm listening with my eyes to explore the invisible: the *'mechanics'*. I take my undergraduate dissertation off the shelf to reflect, my focus was on the internal environments of educational buildings: an enjoyable experience. A dissertation to me is the pinnacle of a degree; likewise, a thesis at doctoral level. Basically, I think it's what makes tertiary education *'higher'*, without it we have overly prescriptive and expensive professional training. As a supervisor, I feel it offers more explicit realisation of growth, as students move from fear to realise being in control of what you learn can be liberating. I'm left bewildered as to why it's diluted down, or de-valued by institutions; marketised short-sightedness. It's the *'artefact of output'* to design for in my view: build a course around, support it properly. Timetabling dissertation tutorials sees synergies between journal perspectives: why do we fit them in at lunch while we eat, and prepare the factory for the afternoon's sausages as we push the broom round? It's another indicator there's a lack of appreciation *'the end is where we start from'*.

Whilst trying to complete my dissertation, I had to negotiate other distractions: modules. Conscious a rant could unfold and nipping it in the bud quick: they just add unnecessary size and weight to the experience. However, I must give one credit, it changed how I viewed my degree; my viewpoint of professional training and *'chasing-the-grade'* replaced with a childlike curiosity to learn. I still had to *'connect-the-dots'*; but my interest in *'invisible architecture'* began here: *'quadrants'* await. I didn't know it then, but I'd caught the *'research bug'* as Etherington (2004, p.18) put's it; and now we're here in *'coronavirus lockdown'* in my little *'black box'.*

One module explored industry methodologies, the RIBA Plan of Works. It offered a project scenario and a real-life client but placed an emphasis on *'actually learning how to design'*; an important feature that can be overlooked in folk-based pedagogy (Powers, 2017, p.22). I began to see patterns exchange between my academic and industry experiences. In whatever context you view it, projects have a *'beginning, middle and end'*, coherence of the middle is important; understanding how to control and adjust the process is crucial. It's knowing there will be *'bumps-in-the-road'*, the art is anticipating them and make corrections; that *'the end is where we start from'*.

From the RIBA Plan of Works, I appreciate dissonance between the conceptual depiction of a process and reality in use. By inferring linearity (Fig. 5.6), a common mistake to make is to start from stage 0 through to 7. Stages just inform a messier reality: how many projects start at a beginning in reality? They don't, they're informed by *'feedforward'*, the end of other projects, or periods of learning; we all bring prior knowledge – experience. Fletcher and Satchwell (2015) offer useful guidance for briefing projects, stages 7, 0 and 1 starting with *'In Use'* (Stage 7). There's an appreciation of *'the end is where we start from'*, a connection to Trafford and Leshem (2008) again.
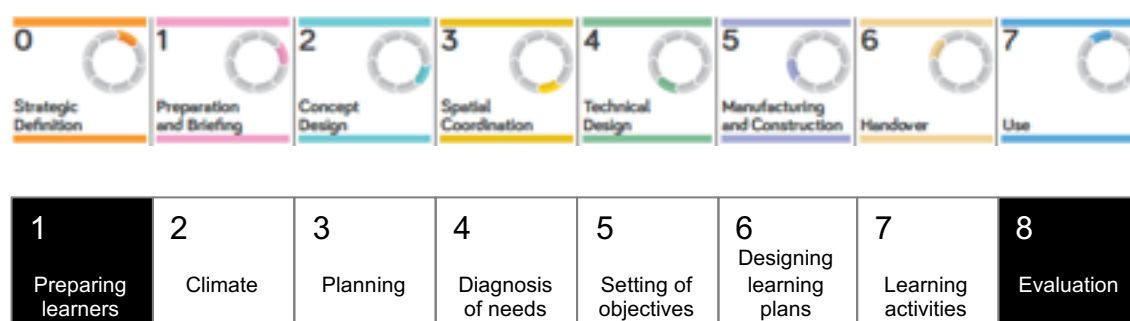
Figure 5.6 – Linear depiction of RIBA Plan of Work 2020 (RIBA, 2020) and the process elements of andragogy. (Knowles et al, 2015, p.52).

Exploring the RIBA Plan of Works in-depth as an undergraduate, I see synergies with the *'process elements of andragogy'* (Knowles et al, 2015, p.53) in Fig. 5.6; their practical value resonates, *'synergy'* between academic and industry methodologies. What hinders them both is the linear depiction; graduates moving into the real world need to know how to *'leap'* intuitively. The numbering of both processes in Fig. 5.6 is what hinders them, we do not *'leap'* in a linear or sequential order, in how we work or learn; the eight chapters of this thesis are built reflecting the principle of Fig. 5.6, but not the reality of how it is put together. The most important parts of Fig. 5.6 are the first and last stages/ elements, in my view it begins with what was; in evaluating prior knowledge.

Linking this to my learning experiences: what have I learned? How do they *'feedforward'* to what I do next? I can think of this by module, year, course, career. Module flow for example hinders *'feedforward'*, semesterisation can make learning *'messy'* and confused at times, for both staff and students. Modules offer *'feedback'*, it can be overlooked and is likely to be *'after the event'*, in my experience leading to two separate *'conversations'*. For example, staff provide summative feedback, students look for grades then generally move on to the next module. Even with formative feedback students can receive differing opinions, even from the same staff week-on-week, which can confuse and doesn't *'feedforward'*. A lack of *'feedforward'* is an issue, it's what brings sender and receiver of the feedback to arrive at consensus, which I felt my dissertation offered.

Coming back to dissertations; my student journal at the time of doing it has more emphasis on topic, reflections offer an implicit awareness of the connection between the process of research and the RIBA Plan of Works; not a full grasp of the connection. However, my staff journal only a year later places emphasis on the process of research; reflections explicitly acknowledge that the topic is secondary, that the research process is the primary focus.

As a supervisor I talk to students about how I'll look through their dissertations at the end, telling them at the beginning. We'd briefly talk topic but more so about the process of doing research, setting milestones and dates; about coherence between the *'beginning, middle and end'*. In a transitional period of being both *'quasi-student'* and *'quasi-teacher'* (Powers, 2017, p.27), *'feedforward'* of my own student dissertation experience helped me. Having an initial conversation about the RIBA Plan of Works, which students could relate to because they had prior knowledge of it, helped to reduce the overwhelming feeling of doing their own dissertations; so, as a *'tool'* it worked in my view.

What a dissertation offers most to the learning experience is simplicity; the exchange of ideas, the *'conversation'*. There's not really a right or wrong way with them; it's a case of what and how you learned and how it feedforwards. There will always be holes in arguments, or in any method used; a dissertation offers a more authentic *'impression'* of someone's learning within a given of time. It won't totally capture someone's learning gain in this period unless you design for it, but it will be an artefact of a shared experience.

I'd like to talk more about the dualities of my dissertation experiences, it's a release from the sausage factory learning; modular not so *'magic moments'*. However, it's an experience shared with others, before entering the doctoral arena. It's an experience that brings out the inner turmoil of doing autoethnography; when does research begin? Thinking of criticisms autoethnography attracts, how the method explicitly showcases the integrity of the writer; do critics really appreciate the ethical focus required? But I'm getting distracted, I want to stay focused on the *'science of design'* in my built environment education.

In striving for simplicity, it's in the idea of *'offline parallel design investigations'* (Kahney, 2013, p.53) that I seek to simplify my thinking whilst exploring the culture I observe. It's whilst typing, preparing the learning of others, using artefacts of someone else's thinking my mind wonders. I'm sitting here in my *'black box'* with my Mac, iPhone, iPad and Apple watch also, they take me into a world where congruence between a process of design and reality can be felt; embodied in a quote Isaacson (2011, p.117) provides from Steve Jobs and echoed by Kahney (2013, p.190):

> *"The main thing in our design is that we have to make things intuitively obvious."*

I think to myself do learners, *'self'* included, struggle with their formal education because much of it is not *'intuitively obvious'* compared to other aspects of our lives? My thoughts turn to Isaacson (2011, p.317), to Apple as Jobs was due to return.

"Engineers would say 'here are the guts' – processor, hard drive – and then it would go to the designers to put it in a box."

This is how I view my built environment education; a collection of *'engineered guts'* put into *'boxes'* and thought of as *'curriculum design'*. Through Isaacson (2011, p.116), Jobs refers to Bauhaus, to mantras *"God is in the details"* and *"Less is more"* which resonate. It's through re-reading about Apple, Jobs and Ive, their pursuit of simplicity, mainly through Isaacson (2011) and Kahney (2013) that my interest in the *'invisible architecture'* grows. Isaacson (2011, p.316) through Ive describes Jobs' philosophy.

"Why do we assume that simple is good? Because with physical products, we have to feel we can dominate them. As you bring order to complexity, you find a way to make the product defer to you. Simplicity isn't just a visual style. It's not just minimalism or the absence of clutter. It involves digging through the depth of complexity. To be truly simple, you have to go really deep. For example, to have no screws on something, you can end up with a product that is so convoluted and so complex. The better way is to go deeper with the simplicity, to understand everything about it and how it's manufactured. You have to deeply understand the essence of a product in order to be able to get rid of the parts that are not essential."

This quote resonates; as a *'physical product',* has the structure of educational programmes *'dominated'* me too much? Meaning I *'defer'* doing the learning in pursuit of the reward; for the majority I feel it has. But although I view built environment education as being too complex, an engineered *'kit-of-parts'*, is simplifying it right? If it were too simple, would I be here now in my *'black box'* writing this thesis *'digging through the complexities'* of my experiences? Probably not. What's the impact of any recommendations to re-imagine Built environment education? I do believe that we can simplify the experience, whilst maintaining appropriate levels of complexity in any level of built environment education; we just need to re-purpose the *'tools'* or artefacts we currently use. If our *'coronavirus lockdown'* teaches us anything, it shows we can adapt and do things differently; but should it be the catalyst to drive change?

In 2019 I attended an academic conference focused on creative and innovative approaches to pedagogic research, it helped to crystallise what I had been thinking myself. I began to reflect more so on the importance of pedagogy as an educator, those that would help me have more explicit conversations with students to connect theory and practice. Coronavirus is likely to bring a *'new normal'*, requiring greater flexibility in how we teach, learn, and assess the ability of learners; a collective appreciation of pedagogy can bring an array of innovative ways to learn, it needs to be a more visible *'conversation'*.

It's in pursuing simplicity I have continually returned to Trafford and Leshem's (2008, p.36) *'quadrants'* throughout this thesis, because they're an *'artefact of output'*, quadrant A I now see as *'invisible architecture'*, the *'toolbox'* to record my *'thinking'* and *'learning'* gain (King, 2012, p.119); integral to showcasing the *'artefacts of output'*. Originally, I sought out optimal *'question patterns'* but I don't need *'optimal'*; I just need to provide *'real world'* insights to make my contribution (Dresch et al, 2015, p.57; Simon 1996), which can be small but still significant (Hart, 1998, p.21; Garfinkel, 1984).

I think my exploration into *'quadrants'* has been for two reasons; first, I think the principle of a viva itself can help to re-imagine built environment education at all levels, to better gauge competence; secondly, as with many learners, there's an underlying anxiety about how you're being assessed. Built environment education in my view offers a confused learning experience, particularly in higher education. Confusion comes from a blurriness between the academic education and the professional training across two industries: two different beasts with different needs.

Flicking through my dissertation I find *'invisible architecture'* hidden within the appendices; four tutorial assessment sheets carrying a small weighting towards the final mark. *'Quadrant A'* is in my thoughts as I explore the technology underpinning my own built environment education. I enjoyed my dissertation but there was no viva with it, the nearest thing to a viva in my undergraduate (UG) experiences were *'crits'* and projects we presented to an audience; I don't view these as vivas, they didn't feel like an exam, just practice to verbally communicate your work if you were selected to present by peers.

I have very few examples of *'viva experiences'* that I can '*time-travel'* to, but I have one I can recall. Completion of my trade apprenticeship comes with a CITB skills test at Bircham Newton, with a threshold to meet. I fail to achieve it because of the roofing tasks, but in making value judgements about me as a person my employer viewed this as acceptable, acknowledging I had little practical experience of roofing at the time beyond the classroom. Whatever subjective or objective markers we bring to assessment at any level, it influences our decision-making. In built environment education, competence within an academic setting through learning outcomes does not necessarily transpose into reality.

In need of another coffee and as I nibble on more mint cake, my thoughts are still with how to explore the *'invisible architecture'* of my built environment education; I can't lose sight of *'Who/ Reaction', 'Where/ Action'*, and '*When/ Resultant'* going into chapter 6. *'When'* we get past the ● we will better understand *'Why/ Reaction'*: a better understanding of my research question will be known.

See no theory, hear no theory, say no theory in practice ●

Exploring educational theory at doctoral level has highlighted a problem I feel with my built environment education, a lack of theory *'conversation'*. Scott et al (2004, p.57) state, *"one of the principal aims of professional doctorate courses is the development of the reflective practitioner"*; it's a principle aim of built environment education at any level. An opportunity to *'naval gaze'*, having space to reflect feels novel because it's never truly felt part of my education; it feels like a *'bolt-on'*, an afterthought.

Lifting up a pile of HNC assignments from the floor I begin to browse. Amongst the scribbled feedback notes are continual reminders that I lack references to support my arguments; one comment about performance requirements of materials and seems poignant for this thesis:

> *"You need to simplify your writing – you are being a little too grandiose in your prose and getting a bit tied up as a consequence".*

Hilarious, perhaps I've always been an *'autoethnographer'?* It makes for fun reading going back over work from nearly 20 years ago, it offers a very nostalgic view of my own learning gain. I delve a little deeper, my *'self-as researcher'* kicks in dissecting the *'self-as-subject'* once again. Past the cover page, learning outcomes and common skills framework, which is something to re-visit, I arrive at grading criteria, thresholds for pass, merit, and for distinction which includes the following:

- *You will have a detailed action plan that will develop over the assignment period. It will show changes to your proposed plan identifying planned completion dates and actual completion dates for parts of/ and the whole of the assignment. Monitoring shows that you have been able to progress with minimal tutor support.*

- *Your work will be reflective and analytical, e.g.: comparing theory, practice and experience.*

- *Prepare a self-evaluation report to reflect on your own performance in terms of approach, and technical content.*

All are evident within the assignment. I compare it with two others: there's a chronological sequence between these assignments, all relating to one unit. Across all of them there's incomplete or missing elements, which would contribute to each of them not achieving distinctions; two out of three do though exposing inconsistency. However, collectively they meet the unit assessment requirements; inconsistencies exposed by compartmentalising design of the learning experience itself, not necessarily the reality of my learning. By breaking down the unit further into multiple assignments, it leads to a crossover of content, which is reflected in the feedback. Unnecessary complexity just adds size and weight, at the expense of giving space to properly *'scaffold'* reflective practice; it reflects a recurring theme at most levels.

Throughout all my assignments an evolving story unfolds, a default action plan develops to meet the distinction threshold. But what captures my attention most with the grading criteria is the *'self-evaluation/ reflective aspect, comparing theory, practice and experience'*. I look again at the three assignments, all self-evaluations are the same: word for word, only one has a tutor comment, but they were completed at different times. Some *'mimicking'*, my skills developing to think about what staff want to see and hear (Didau and Rose, 2016, p.15). To successfully meet assessment criteria and cut corners, it would seem I'm actively *'thinking'* about getting from A to B, at the expense of reflecting on my *'learning'* during these units (Didau and Rose, 2016, p.16).

My reflection-in-action was to bypass this process because it was boring, my reflection-on-action nearly 20 years later is I wasn't taught to reflect, or *'scaffolded'* properly to do it. Much of my education in this area has been *'tokenistic'* self-reflections parked at the back of assignments, completed mainly the night before hand-in dates, or just before submission. But I think that *'reflective practice'* is an important piece of *'scaffolding'*; it's a transferable *'tool'* that transcends both construction and education; it helps practice make sense of theory in my case. However, prior knowledge and experience are needed to competently use such tools. Bolton (2010, p.5) states whilst referring to a range of other sources:

> *"Reflective practice which genuinely affects practitioners lives, and those around them, needs confident experienced teaching and facilitating. Students or employees required to write journals and accounts of practice without being inducted and facilitated well are likely to experience feelings of helplessness, frustration and burnout, be resistant, negative, or even angry, challenged, threatened, demoralized, shocked, and put off by the leap into the unknown, and they might focus merely on technical skills, or write safely and hypothetically about themes rather than specific experiences."*

Many of my assignments at different levels have a *'tokenistic'* weighting, to incentivise reflections. But you don't fully invest time in the process because as a student it doesn't feel valued, or a priority to staff. I think *'folk pedagogy'* influences this, staff with a mentality of *'it was good enough for me'* are not likely to fully embrace it in their own practice of teaching others; I've seen some don't. Self-reflection for many professionals is an intuitive process; possibly why it feels like a token gesture in professional body criteria?

As a pracademic I've come to value reflective practice, because once past the inconsistently completed assessments; what students are left with is *'conversations'* with those people that have helped them along the way. Reflective practice is an undervalued tool lacking sufficient *'scaffolding'* in the experience, but it can be such a simple tool to hand down to others. My thoughts travel back to pedagogy being a default term; psychologically does it influence why reflective practice is inadequately *'scaffolded'* and not explicitly taught? Too grandiose?

144

The *'stepping stone'* my HNC experience provides is that it takes me from being a 13-year-old child (Table 5.1, p.129) to being an adult, my HNC brings fond memories because I was actively ready to learn, taking me back into the andragogical domain. Knowles et al (2015, p.51) outline the andragogical process model of learning, explicitly discussing the difference with *'content'* and *'process'* models to state:

> *"In traditional education the instructor (teacher or trainer or curriculum committee) decides in advance what knowledge or skills need to be transmitted, arranges this body of content into logical units, selects the most efficient means of transmitting this content (lectures, readings, laboratory exercises, films, tapes, etc.), and then develops a plan for presenting these content units in some sort of sequence. This is a content model (or design)."*

Two immediate thoughts; how have the *'content models'* faired in *'lockdown'*? Challenging. Is the design of the *'engineered content models'* sufficiently appreciated when the learner is being designed for and not with from the outset? I'm biased. But seriously, I feel *'content models'*, pedagogical or not, have limited my learning at times; there's a need for a smoother *'process'* to better deliver *'content'*. In saying this what I have to acknowledge is, that my bias comes from not having explicit conversations to help better understand the majority of my own experiences as a learner. Table 5.2 reflects on my HNC experience against both pedagogical and andragogical approaches.

Table 5.2 – Evaluating HNC experience against pedagogical and andragogical approaches (Adapted from Knowles et al (2015, p.52).

	Process Element	Pedagogical approach	Andragogical approach	Evaluation of HNC with pedagogical and andragogical approaches
1	Preparing learners	Minimal	Provide information Prepare participation Help develop realistic expectations Begin thinking about content	Course & unit info. provided by staff Prepared by staff Incentivized through grading criteria Staff-led discussion and activities
2	Climate	Authority-orientated Formal Competitive	Relaxed, trusting Mutually respectful Informal, warm, collaborative, supportive Openness and authenticity Humanness	Small cohort (20 max. students) Developed through course Inclusive environment, supportive, with good peer relationships developed Authentic as a result of new experience Good competitive community environment
3	Planning	By instructor	Mechanism for mutual planning by learners and facilitator	Staff *'scaffold'* mutual planning (Action Plans and common skills framework)
4	Diagnosis of needs	By instructor	By mutual assessment	Some flexibility to suit learner needs, self-evaluations not fully discussed
5	Setting of objectives	By instructor	By mutual negotiation	Determined by qualifying body and delivered by staff
6	Designing learning plans	Logic of subject matter Content units	Sequenced by readiness Problem units	Assignments and units sequenced by staff Both content and problem-based units
7	Learning activities	Transmittal techniques	Experiential techniques (inquiry)	Both transmittal and experiential but with little to no theoretical underpinning
8	Evaluation	By instructor	Mutual re-diagnosis of needs Mutual measurement of program	Some mutual re-diagnosis of needs Through common skills framework

There's a relationship to appreciate between *'content'* and *'process'*, between transmission and acquisition; a *'scaffolded transition'* towards self-direction reflected in my HNC. Based on the *'underlying assumptions'* Knowles et al (2015, p.52) offer for both pedagogy and andragogy within Table 5.2 (p.145), it's clear there's a more pedagogical approach. It's also clear there's a transition towards an andragogical approach and self-direction within the environment created, in the *'scaffolded'* frameworks to aid self-efficacy, inclusion of work-based experiences and in monitoring my developmental needs. But like most of my built environment education, it's been completed without any explicit understanding of theory to which I question what purpose does learning theory serve practice? Now it's to make sense of my experience, but it shouldn't need 30 years *'concrete experience'* (Kolb, 2015, p.27) to explore associated theories; it should be a more explicit conversation between learners and *'scaffolders'*; child or adult learners I feel.

In clarifying the difference between *'content'* and *'process'* models, Knowles et al (2015, p.51) state:

> *"the difference is that the content model is concerned with transmitting information and skills, whereas the process model is concerned with providing procedures and resources for helping learners acquire information and skills."*

What Knowles et al (2015, p.51) suggests is that by being too pedagogical much of my built environment education has focused on *'content'*, transmitting thinking and skills of others, I've only appreciated this now as a pracademic. By not being more explicit in providing the theoretical knowledge to underpin my learning, I've potentially been limited in valuing the *'process'* of how I've learnt; to appreciate the innate knowledge and skills I was born with. As an adult learner I needed information and resources to acquire a greater appreciation of the skills I had or will acquire; a pracademic view is I think as staff we overlook it and just resort to instinct. The *'engineered content-driven models'* have dominated my professional education, possibly at the expense of personal growth; inquiry lost in transmission because of a lack of knowledge to identify how I learn. As a result, I think my actual learning came after successfully completing my HNC, not really within it; inferences can be made about my learning based on performance and grades, but this can be a very poor indicator of my learning in reality (Didau and Rose, 2016, p.15).

On reflection, my built environment education has confused me at times, when looking to assess competence is it about testing how somebody neatly re-packages the transmitted *'content'*? Or is it how competently somebody articulates the *'process'* of their own inquiry when operating in practice? In a *'knowledge age'* with opaque '*fake news',* easily accessible information and transmitted re-gurgitated *'content'*; do we impinge on a learner's potential to acquire skills; to evolve and be authentic in a shape-shifting society?

146

My HNC brings me to a place where I became more interested in learning, I'll keep it brief. A *'point of origin'*, an experience that defines the direction of one's life; an entangled moment of ontological and epistemological disturbance (Crease and Goldhaber, 2014, p.219), *'sofastuck'* in a multiverse with a pretty big decision to make. A *'point of origin'* comes during a prolonged period off work. Ruptured cruciate: football finished. A six-month *'unscaffolded'* reflective period in the wilderness, World Cup, boxsets of *'Friends'*, Mexico, physio. At the *'point of origin'* a character lurks, I now know him as Socrates, driving me to *"Know Thyself"* (Hubbard, 2016, p.17).

From *'Dancing in the Dark'* with Springsteen to now writing in my *'black box'*; a *'point of origin'* brings a motivation to learn, career change, college, learning to use a computer and dial-up internet. Motivated and ready to learn I had *'scaffolding'* to aid self-direction; implicit use of theories to underpin my learning I could say hindered it, but that's the benefit of hindsight. En route to better *'know thyself'* I wouldn't say *'self-directed'* (andragogy), or *'self-determined'* (heutagogy) are terms I'm looking for, it's been learning to be a more *'self-disciplined'* one; lacking at 13 years old (Table 5.1, p.129) I'm reminded. Being in periods such as *'lockdown'* magnifies environments do matter because we all think and learn differently in our own *'self-built boxes'*.

What my HNC did offer was an unconfused experience focused on developing my technical knowledge. My HNC experience lacked explicit conversation about underpinning theories, it also lacked a full appreciation of my prior experiences, and to crystallise what personal transformation should look like by the end to evaluate it. The self-evaluations, feedback and possibly even the common skills framework are not potentially a true measure of me. My HNC was successful, however; I think my motivation was more personal than professional; a love affair with studying (Montessori, 2007). I was not fully cognisant of my learning gain whilst studying, assessment or realisation of it came afterwards. On reflection, in order to *'know thyself'*, my *'point of origin'* has highlighted that my formal built environment education acts to consolidate my experience when I've needed direction personally. Isaacson (2017, p.18) refers to Leonardo da Vinci:

> *"First I shall do some experiments before I will proceed further; because my intention is to consult experience first then with reasoning show why such experience is bound to operate in such a way."*

Exploring andragogy has helped me realise this, so the question I ask myself is: does a curriculum measure the person or the course? If realisation of learning gain happens after a period of learning, surely, we're mainly assessing course *'content'*, not the competence of learners? I'll think about this a little more, look out for the 🔵 it will *'connect-all-the-dots'* in this chapter; I'm going for a walk because I need to work off this mint cake.

● Thinking gain in learning with pain

I stand at the door, set my watch to record my walk, put headphones in, pick an appropriate playlist and I'm off. Immediate thoughts are still with curriculum potentially measuring course content not people; ACDC *'Thunderstruck'* kicks in, my head's nodding; thoughts start to wander and within a few minutes I'm in a different environment (Fig. 5.7).

Figure 5.7 – A wander with my thoughts in a different environment. (By author).

Looking over the water my thoughts fall back briefly to reflecting on my *'point of origin',* then swiftly on as a train passes me. I think of the commute, one many others undertake before our *'lockdown learning'* adventure. I've felt the impact of the long commute that Moss (2019) discusses, and many others face as they navigate their way to campus', which now sit vacant due to this pandemic. I'm in two minds about commutes, they provide space *to 'time-travel'*, to *'naval-gaze'* out the window, read, or make reflective journal notes; but they can also be a place to hinder body and mind. Even the most level-headed can be taken down by the commute, a build-up of big audiences and shifts at the sausage factory; one in six workers suffer depression, anxiety or stress in the UK (Mates in Mind, 2019).

I've become a statistic, anxiety brings a new experience; invincibility vaporises into fresh air, I feel damaged and broken. A long-daily commute and intense work environment brings panic, fear, pain and stress. Shutting the door dripping with sweat: collapse. My body is embraced by the sofa, for around 2 months life passes me by. For 5 months I'm in the wilderness, a period including a minor operation, a range of tests, wellbeing sessions and experimenting with a range of prescription drugs; a guinea pig experience, diagnosis – *'fibromyalgia' (FMS) and chronic fatigue syndrome (CFS).*

NHS (2019) labels fibromyalgia as a; *"syndrome: (FMS), is a long-term pain condition that causes pain all over your body"*. Liptan (2016, p.10) refers to fibromyalgia as a disease, which *"has a specific cause or causes and recognisable signs and symptoms"*. Liptan, a doctor and fibromyalgia sufferer, provides great insights; but if there's no method for direct diagnosis, I'm not sure how we determine if I'm diseased or not. With an array of symptoms, it affects people in different ways; how do I know I have it? Ingraham (2019) refers to Dr Fred Wolfe who highlights *'how fibromyalgia is being buried by an avalanche of crappy useless research'*. I wouldn't place Liptan (2016) in this category, a very helpful guide. Being in the wilderness provides a valuable learning experience, one with symptoms that can limit but all manageable. More importantly in using autoethnography comes a realisation: I just don't want to deliver *'crappy useless research'*.

Academia is not all long summer holidays as some may think, there's significant peaks and troughs with periods of prolonged stress, for both staff and students. Construction has peaks and troughs, but semesterisation of the academic year is a war of attrition. At a time when academics seem to work when ill out of fear of losing their jobs (Grove, 2019), and students work on multiple zero-hour contracts just to survive and study part-time or full-time, *'lockdown'* brings opportunity for wholesale change. If we don't place people central to any transformation of a marketised education, in how we deliver built environment education; why should we expect future built environment professionals to care about how they impact people and society? Sausages need careful cooking, so their skins don't split.

Stigma comes with mental health issues, autoethnography offers a way to deliver impactful, insightful, and innovative research for a *'self-as-researcher'* in my view*;* to do more than just raise awareness of mental health. Initially dismissive of fibromyalgia as a real condition, it's only when you experience it yourself can you begin to appreciate its impact. Its symptoms have come as a result of genetics, stress, or any number of things, they can be described, and others may empathise, but the reality is it's my pain and mine alone; so, you move forward and have to learn from it. When you go through an experience that ends up with you being thought of as disabled it *'twists with your melon'*.

For nearly 5 months lifting my *'Fortnite teacher'* is impossible, I'm used to manhandling heavier loads. The legacy of this *'syndrome'* and its symptoms moving past the guinea pig period in the wilderness, brings a different challenge and a need to re-evaluate. It's meant embracing change, accepting the challenge it brings and channelling it to gain a greater focus on how to move forward. This is where resilience kicks in, you can talk and write about it, but you cannot teach it, something has to click in you individually. However, resilience can only get you so far, to show spirit, initiative, and resourcefulness you need to have gumption; and as I've found out in life that doesn't come on prescription.

From my *'sofastuck'* sabbatical I slowly re-boot, a period of deep *'Man-Chine'* learning. My focus is making a '*negative event'* a more *'positive'* one: I'm a *'growth mindset Man-Chine'* (Syed, 2015, p.273). An unintended learning path contributes to informing the decision to use autoethnography in this thesis, a big learning gain would be missing and left unspoken without it; together they bring more *'soul'* and verisimilitude, but without you having the symptoms. With ACDC in the ears a re-imagined *'man-chine'* goes from *'sofastuck to Thunderstruck'*, to reduce the cognitive dissonance in *'self'*. The benefit of time and space to adapt brings a different perspective, my doctoral journey the richer for it. Approaching home Sinatra *'My Way'* plays, I stop my watch; the head feels clearer. We sit and eat dinner, have some birthday cake; I walk back into my *'black box'*.

Once past a *'sofastuck'* sabbatical, my slow re-boot brings a problem; as part of my built environment education, my doctoral programme crucially provided the environment and space to adjust. For months words fall off pages; a foggy neurological symptom. But I can look at and stare through screens, doodle, draw and build models. I work with spells of dictating, of typing, being almost *'cat-like';* away in subconscious *'naval-gazing'*. Managing the physical and neurological is a constant, but opens up different ways of working, brought greater efficiency if anything; I've learnt new *'tools'*. From the dissonance created by a body that has to exercise and one that doesn't want to, I begin to explore the patterns between both my *'thinking gain'* and my *'learning gain'*. During my re-boot re-visiting the QAA (2014) criteria proved fruitful as I re-evaluated what a *'holder of a doctoral qualification'* means; *'the absence of complete data'* connects me to a quote from Brown University (Lee, 2019) who offer an analogy that resonates with the medical undertones of my guinea pig experience:

> *"Abductive reasoning is most easily understood through the analogy of a doctor diagnosing his patient's illness. He gathers a hypothesis from the patient's symptoms, or otherwise evidence that he deems factual, and from there, goes down the list of maladies and tries to assign the appropriate illness. This is opposed to deductive or inductive reasoning – more generally, abductive reasoning is the logical process where one chooses a hypothesis that would best fit the given facts".*

Through rigorous medical examinations, tests and process of elimination, experimentation with different prescription drugs, my diagnosis is an abductive *'best guess'*. With no method to *'directly diagnose'* and *'in the absence of complete data'*, diagnosis is based on presented facts, my personal experiences and abductive reasoning of medical professionals.

In periods of *'re-booting'*, it's been through exploring the thinking and support of others I've normally re-discovered myself. ***'When'*** life distracts us from stories we anticipate telling, even if the learning outcomes shift; we can actually learn more about the hidden geometry of ***'how'*** we think. ***'When'*** learning new *'tools'* and focusing on the *'process'* of ***'how'*** we think and learn, we gain a deeper understanding of the *'content'* our experience presents us. Frank (1995, p.65) suggests in periods when we're ill:

> *"The worlds that any of us move through are challenging, and illness requires an enhanced concentration of energies to meet those challenges"*.

Etherington (2004, p.146) states:

> *"In the process of paying attention to our history and experiences while writing autoethnography, we may enter into a creative process that helps us remember and re-collect aspects of our experiences that may have been known tacitly or intuitively without knowing 'how' we know."*

My thoughts are with *'how'* the curriculum of my life can creatively capture my learning gain.

Coming back to my *'walk reflections'* I bring together a collection of data from iPhone apps I use to record my sleep, diet, exercise, location and make general health comments in from day-to-day. This has become part of my daily practice for a few years now, a disciplined way to record and monitor myself; to enhance my fieldwork practices of collecting data in journal entries etc. I collect data in many ways through apps on my phone, an untapped rich resource for many learners. For me it offers a *'real-time'* curriculum, one connecting a *'path I have followed with a path I intend to follow';* the curriculum quotes McKernan (2008, p.11) provides (p.135).

Fig. 5.8 extracts the data relating to my walk (p.148). We see I went shopping; an expanded segment would state when and where. I did two walks; one is expanded providing time and heart rate etc. We can see how I slept both the night before my birthday and the night of it, you cannot see dates; my birthday is mine. I own the data but don't actually control it, it's delegated to those that design the apps I choose to learn with.

Figure 5.8 – A collection of data recorded in Sleep Cycle (2020), LifeCycle (NorthCube, 2020) and Activity (Apple, 2020) apps; record health, sleep, diet, exercise and location.

What Fig. 5.8 (p.151) highlights is not so much that I have a rich data source available in the palm of my hand or on my wrist, it reminds me of the difference between real-life learning and much of my formal education. Through apps on my phone or on my watch I control the snapshot in Fig. 5.8 (p.151); it represents a *'content model'.* A curriculum where *'content'* is controlled by others can be a frustrating and confusing experience. You can't fully share the same learning experience as me with Fig. 5.8 (p.151), because it's in my phone and watch; it's my health, diet, sleep and exercise data. By giving you only a snapshot, it's different to how I'm experiencing it in *'real-time'*; you're learning my curriculum. As a learner, this is how I've come to reflect on much of my built environment education, as someone else's curriculum; someone else's story. When others design, control and own the *'content'* I struggle, because when somebody doesn't like your version of their thinking in traditional curriculum models the grades generally tend to suffer; energy levels go down.

I could focus on the negatives of recording such data, tell you that on the last day at work before going into the *'wilderness'*, over a nine-hour period I burnt over 4500 calories, that my heart rate averaged 112bpm and peaked at 158bpm and that I fell through the door at home exhausted; however, I want to maintain a focus on the positives of this period and look forward.

Fig. 5.9 is a phone screenshot of badges I began to collect, once past my initial two month *'sofa sabbatical'* I began to steadily exercise, using the goals my phone offered. As my fitness improved the goals changed as targets were met, my motivation to improve and get stronger developed; aided by strong medication initially helped. Over a 4-year period, my life has become my curriculum, a challenge not problem-based model.
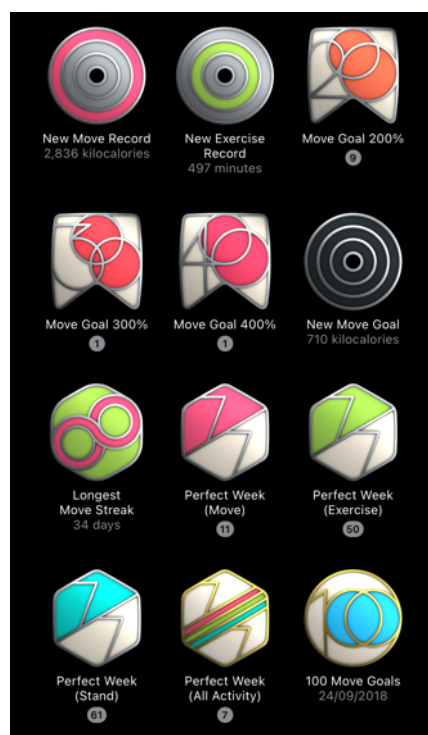

Figure 5.9 – Phone screenshot of challenge badges (by author)

By designing a curriculum model to help learners utilise their own *'real-time content'*, we as *'scaffolders'* can better utilise our own experience to support the *'process',* provide *'content'* to help learners analyse their *'real-time'* experiences; we all just need to better value data from *'paths we follow'*. With so much data easily accessible to learners surely the knowledge to exchange is in the *'process'* isn't it? Google, Amazon, Facebook and Apple themselves have made it *'intuitively obvious'*; they've gained significantly from volunteers of data and lives of others. There's more opportunity for authentic assessment, especially if combined with oral exams in some form to assess and determine competence.

The idea of *'lifelogging'* (Sharples, 2019, p.55) through phone apps, learning from my data came from Buckminster Fullers *'Chronofile'*; he documented his life as comprehensively as possible, every 15 minutes for over 60 years. It's considered to be the most documented life in human history, currently held at Stanford University; it contains a wide range of artefacts. Consciously organising my own *'Chronofiles'* has helped explore my experiences in my built environment education, the *'pain'* I have now is a word limit and closing the lid on my *'black box'*. But '*connecting-the-dots'* here brings me back to personal development frameworks, which can be buried under disciplinary content, based on my own experiences of built environment education; a possible driver for my fascination with quadrant A: '*Technology of the Thesis'* (Trafford and Leshem, 2008)?

I've always been interested in delivering personal development content, if valued and *'scaffolded'* properly it can help *'connect-the-dots'* of learning experiences once working in practice. I place a high value on *'process'*, because above all else, assessment and grades included, it's what links my built environment education to working life. '*Connecting-dots'* in this chapter I see synergies between *'Strategic Definition/ In Use'* in the RIBA Plan of Works (Fig. 5.6, p.139) and *'Preparation of the Learner/ Evaluation'*, that they're *'intuitively obvious'* frameworks to synergise theory and practice. It's *'invisible architecture'* and where the true assessment is; another driver of my fascination with quadrant A: '*Technology of the Thesis'* (Trafford and Leshem (2008) possibly?

Coming back to my HNC, the common skills framework; looking through all my assignments the framework evolved to include an *'evidence'* section. Browsing through assignments from both degree experiences, there's no equivalent; nothing coherent to crystallise my personal development other than *'tokenistic'*, half-hearted self-reflections across modules. If measuring competence shouldn't assessment have a greater focus on *'evidencing'* my development? It's surely where the *'holy grail'* (SEDA, 2020) of learning gain is, isn't it?

By undervaluing personal development frameworks a big *'learning gain'* is being missed, I offer an example: This thesis is an artefact of my doctoral journey, but it doesn't truly tell you about my iterative journey working towards a qualification. It's part of a contrived reality; an *'impression'* of my *'lived experience'* (Adams, Holman-Jones and Ellis, 2015, p.84). In my case you have an increased awareness as it's come into focus; but if we talked about my *'institutional chronofile'* in a viva, which houses my iterative journey and drafts of my work, we would better appreciate my actual learning gain. This is an area of dissonance with assessment in built environment education, because in my view by design we don't actually seek learning gain; learning outcomes can be mimicked which can mask the actual ability of learners, making me question how I have been assessed at different times.

I pull out certificates from my apprenticeship, I've both traditional City & Guilds qualifications and NVQ's; a transitional period in the early 1990's. City & Guilds mixed classroom and practical workshops; exams and assignments tended to be towards the end of a unit or year. At the time I thought of NVQ's as an inferior product. However, I've come to appreciate that NVQ's suited me as a learner, that a more accurate assessment was made as I completed tasks, a *'real life'* assessment of my competence I just didn't appreciate it. As learners we lack awareness of what we need; knowledge of how best to learn. As *'scaffolders'* we can fail to prepare learners properly at induction; so how can we accurately assess them at the end? It's from reflecting on my apprenticeship as an educator, I realise how little awareness I had of my learning needs at the time.

In respect to my apprenticeship, I was pushed into it, not interested in it academically. Going to college was just like school, of going through the motions; whether it was City & Guilds, or NVQ didn't matter. Going to college felt alien, it wasn't like work; it felt one step removed, even with NVQ's you had to attend college to be assessed. But on reflection NVQ style assessment probably suits me as a learner, even at doctoral level I'm possibly hindered by doing a traditional thesis and viva; however, by facing this challenge comes a greater realisation of my learning gain. Maybe this is an underlying reason for my continual interest in quadrant A (Trafford and Leshem, 2008)? I've been seeking a framework; a template (DNA) to crystallise how I think and learn (RNA).

This makes me reflect on another experience, the British Architectural Library at the RIBA headquarters at Portland Place in London. Not many people, it's a calm and soothing place, feels odd to put my bag in a locker. I take in the books and suck in the rich quality of the environment; don't forget environments I note. I'm looking for *'Planning for Productivity'* (Lonberg-Holm and Larsen, 1940): it precedes the *'Development Index'* (Lonberg-Holm and Larsen, 1953); available online. *'Planning for Productivity'* requires a visit, it appears there's only one place you can view it in the UK; it also requires a librarian to go into a locked archive once you've requested it. *'Planning for Productivity'* isn't a big document, 45 pages cover-to-cover, focused on building information and productivity. I became aware of Knud Lonberg-Holm as a student, through Makovsky (Metropolis, 2014) and Ubu Gallery (2014). Both depict Lonberg-Holm as *"The Invisible Architect of Invisible Architecture"*, an array of artefacts like *'Planning for Productivity'* (1940), which Strum (2018) chronicles in outlining the relationship between Buckminster Fuller and Lonberg-Holm. The *'Development Index'* (Lonberg-Holm and Larsen, 1953) that shapes my thoughts most:

> *"a proposed pattern for organizing and facilitating the flow of information needed by man in furthering his own development, with particular reference to the development of buildings and communities and other forms of environmental control."*

154

Both Lonberg-Holm and Buckminster Fuller have influenced my thinking; has Lonberg-Holm subconsciously directed my interest in quadrant A: '*Technology of the Thesis'* (Trafford and Leshem (2008)? Strum (2018, p.215) highlights how Fuller pays homage to Lonberg-Holm, outlining how *'invisibility'* could be thought of with Lonberg-Holm:

1. *As part of his theory of ephemeralization and tensegrity.*
2. *Informational.*
3. *It suggests the anonymous, uncredited, and seemingly authorless.*
4. *May be understood more generally as the disappearance of the architect due to the culmination of automated processes and the new liberating potentialities of the computer.*

Reflecting on these as a *'pracademic'*, I see success in the gradual reduction of the information needed as others progress; that my thinking is present in others but not at the expense of their own journey; that by embracing different ways of doing things I become both learner and *'scaffolder'*: artefact and architect in synergy, helping others on their own journey through built environment education as I disappear.
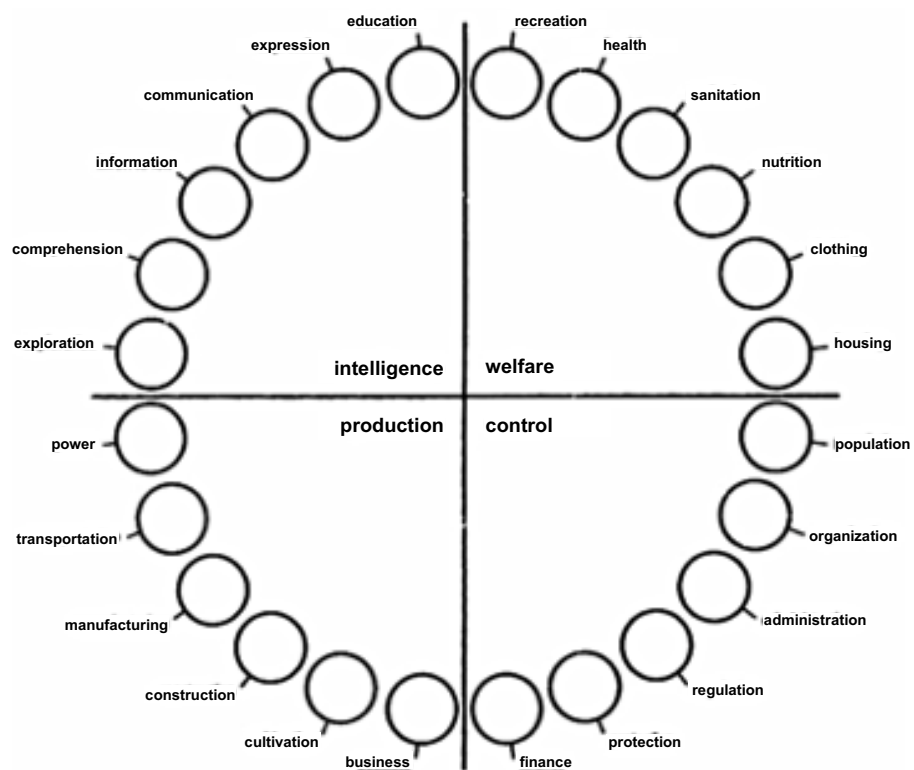
Figure 5.10 – Fields of Activity. (Lonberg-Holm and Larsen, 1953, p.23, touched up by author).

The *'Development Index'* (Lonberg-Holm and Larsen, 1953, p.23) offers *'fields of activity'*, Fig. 5.10 unlike Vitae's (2020) Researcher Development Framework (RDF) which can be used for doctoral level study it is a simple *'tool'*, it allows for personal interpretation. The central wording, *'fields of activity'*, within Fig. 5.10 offers food-for-thought, the outer subjects provide scope of what the *'built environment'* can offer; something to *'scaffold'* my thoughts on experiential models from chapter 3, to further consider going into the next chapter.

The *'Development Index'* has provided *'tools'* to unlock my experience, a journey I can now trace back to a *'point of origin'*, a place I consciously began to think about my development and that of others; Lonberg-Holm and Larsen, (1953, p.9) state:

> *"Implicit in the term 'development' is a concept of man as an entity which strives endlessly to reach and undefined wholeness and completeness. Such emergence is expressed by an increasing variety of human needs in satisfying these needs, man has available all the resources of his environment, including himself.*
>
> *Development thus becomes a problem of continually perceiving new needs and transforming the various environmental relationships into new forms of patterns of activity that will serve man to ever better advantage. By creating new forms to meet new needs man increases the wealth of resources at this command. In the process more needs are created which call for a further development of available means."*

In moments where it's felt like my *'development'* was on hold, re-visiting the *'Development Index'* and its *'fields of activity'* led me to Vitae's (2020) RDF. It has its critics for being *'reductionist'* or *'over-simplified'*, but Dunn (2020) suggests staff and researcher's see value in it to aid their thinking at times of appraisal. The core *'domains'* do offer some interest, but it's cumbersome and lacks directional value as a model. But the RDF is a good precedent; if only to highlight what I feel is missing at undergraduate level.

This chapter of my life has brought student and teacher together, provided an environment to support my own curriculum; Montessori is subtly used, you hardly know she's here. I have been able to connect the past and the present, had some freedom to roam whilst still being directed by a range of information and experiences I have. From a fascination of *'quadrants'*, I have been able to delve into areas I felt were missing from my education at different times but contextualise it within the present through autoethnography.

But in reflexively re-imagining myself it's been Socrates (Hubbard, 2016, p.17), pushing me *'to know thyself'*, that's reminded me to let go of *'striving'* for change, to focus on *'self'*:

> *"to deliberately go in search of experience, would be a mistake, because then you would so multiply impressions that none would be of any avail and your life would be burned out. To clutch life by the throat and demand that it shall stand and deliver is to place yourself so out of harmony with your environment that you will get nothing."*

In seeking new solutions for built environment education, it's taken a period in the wilderness with my *'black box'* to gain a greater insight into *'self'*. I still view Knowles et al (2015) andragogy model (Fig. 4.22, p.122) to be the *'tool'* to take forward with me into chapter 6; along with its process elements also, as outlined in Table 5.2 (p.145). Together they offer a model, with Montessori is a way to conduct the *'conversation'* with characters in chapter 6, reminding me that some of the best ideas come from looking backwards; *'connecting-the-dots'* that others provide helps to move us forwards.

Chapter reflections and insights ●

This chapter has brought out things I had not appreciated until now, particularly from my trade apprenticeship and NVQ's, and my HNC. It highlights how unaware as learners we can be of the *'scaffolding'* around us, that despite NVQ's being viewed as an inferior product they actually suit my way of learning. Although a capable learner, my school reports suggest an underlying anxiety with exams, poor exam performance informing me NVQ's are likely to have more accurately assessed me than City & Guilds. However, this anxiety comes from me not being prepared as a learner and not being *'scaffolded'* properly, evident in different periods of my built environment education.

A DProf through an *'NVQ style'* creative portfolio, may better suit my skillset, compared to writing a thesis and having viva. But in showcasing my strengths to meet criteria, which may not judge autoethnography, would limiting myself to a disciplinary field help me take the *'intuitive leaps'* necessary to make a contribution? *'Discipline'* to me means, being rigorous in approach, to be congruent with my unorthodox journey and all that it offers; as I'm reminded by Issacson (2011, p.316):

> *"The better way is to go deeper with the simplicity, to understand everything about it and how it's manufactured. You have to deeply understand the essence of a product in order to be able to get rid of the parts that are not essential."*

When life brings unexpected challenges, more frank and honest assessments are made; what's left is the *'parts'* that are essential. It would be convoluted to separate the personal and professional, the text and the graphical in a portfolio or appendices because separation would distract the true *'conversation'*; add weight to my writing. The *'better way is to go deeper'*, face the challenge; to gain a *'deeper understanding of self'* whilst in the process of writing. More complete assessments can be made of the *'process'* both during and after of how the *'content'* and person comes to be at a point in time, of their curriculum.

Assignments from different periods suggest reflective practice is an undervalued *'tool'*, that course *'content models'* and thinking of others possibly dominate the experience to the detriment of my personal growth. Exploration into pedagogy, andragogy and heutagogy raises questions of what is being assessed, learners or course learning outcomes? There's a need for greater clarity in what needs assessing, and in which environment assessment should be made. As learner's we enter new environments with the lid of our *'black boxes'* shut, unaware of *'tools'* we need. As *'scaffolders'* the knowledge to exchange is not transmitting the *'content'* of our experience, it's to provide the *'process'* of how we acquired the *'content'* itself. If institutions are interested in learning gain, assessing students on the *'paths they've followed'* on the way in is needed through induction; *'feedforward'* of prior experiences will help to better evaluate *'intended paths we've followed'* on the way out.

From a better appreciation of my pedagogy, andragogy and heutagogy, comes also a wider perspective of what curriculum can be; a means to reflect on the *'paths we have followed and the paths we intend to follow'* (p.135), this has opened up my thinking to reflect on some of the more challenging moments in my life. Both Montessori and Knowles have subtly supported the *'conversation'* in this chapter, a very personalised account. It includes data using innovative pedagogies such as *'lifelogging'* (Sharples, 2019, p.55), using data from phone apps that monitor health, diet, sleep, location and exercise; this has focused my fieldwork practices whilst working with autoethnography.

This chapter includes a period of illness, from a period where life seemed to stand still has come a rich learning journey; requiring significant adjustment, in my view this is a credit to the flexibility that my doctoral programme offers in its design. From this period has come a connection to my HNC, to the common skills framework which I will look to explore more so in chapter 6. My doctoral programme monitors my progress through annual reviews, so I will look at personal development frameworks further, because in my view they are integral to measuring and assessing true learning gain.

The two nuggets I pull from this chapter is pedagogy and personalisation: although I refer to andragogy and will do so again in chapter 6, pedagogy is a better term to bring teaching and learning together, more widely used. With personalisation it is with an eye on graduate attributes, on the *'artefacts of output'*, for which personal development frameworks, the *'invisible architecture',* are important I feel; particularly in considering any recommendations going into chapter 8.

I will use the same process as this chapter in chapter 6, another autoethnographic chapter in which all six characters will be involved in the *'conversation'*. Fig. 5.1 (p.127) offers a simple framework to guide my writing, allowing me to meander and let the story unfold but importantly not significantly go off on a tangent; this chapter may appear a bit random, but as we learnt in chapter 3 even randomness has an underlying order (Fig. 3.23, p.80). This chapter is likely to mean more to me than to you in its significance, but it serves as a good precedent of how effective learning can be when the curriculum of one's life is given space in the programmes we study; true learning gain is evident in the process of learning, giving me something to think about moving forward.

Chapter 6 – Experiencing Theory in Practice

This autoethnographic chapter draws inspiration from chapters 3 and 5 to develop the story further, as well as building on the literature reviewed in chapter 4. This chapter is *'geared up'* differently to chapter 5, which was driven centrally by looking to bring congruence between my own learning and thinking gain; Fig. 6.1 has six individual components within a system, which grows centrally to help deliver more insights into built environment education. The analysis segments of Fig. 6.1 focus on providing *'feedback'*, which led the story in chapter 5; this chapter begins with *'feedforward'* to help set the scene initially.

The analysis series of *'events'* in Fig. 6.1 chronologically travel through different periods of built environment education, the synthesis series helps direct the story but not necessarily in a chronological manner; each is associated with a character, which means they are the character leading the conversation in that *'event'*. Each *'event'*, similar to chapter 5, is signposted in reference to Fig. 6.1 which should help you to *'connect-the-dots'*; however, by emphasizing the characters in Fig. 6.1 each of the events has different story headings.

The *'feedforward'* characters in this chapter are *'scaffolders'* they facilitate the *'feedback'* characters, the designer and scientist characters are mainly participant observers who are focused on chapter 8; although mainly invisible, they are purposely made visible to inform direction at certain times. The overall story seeks to develop more insights through different periods of my built environment education, it utilises humanist theories and concepts to help navigate characters through this story which were outlined in chapter 4.
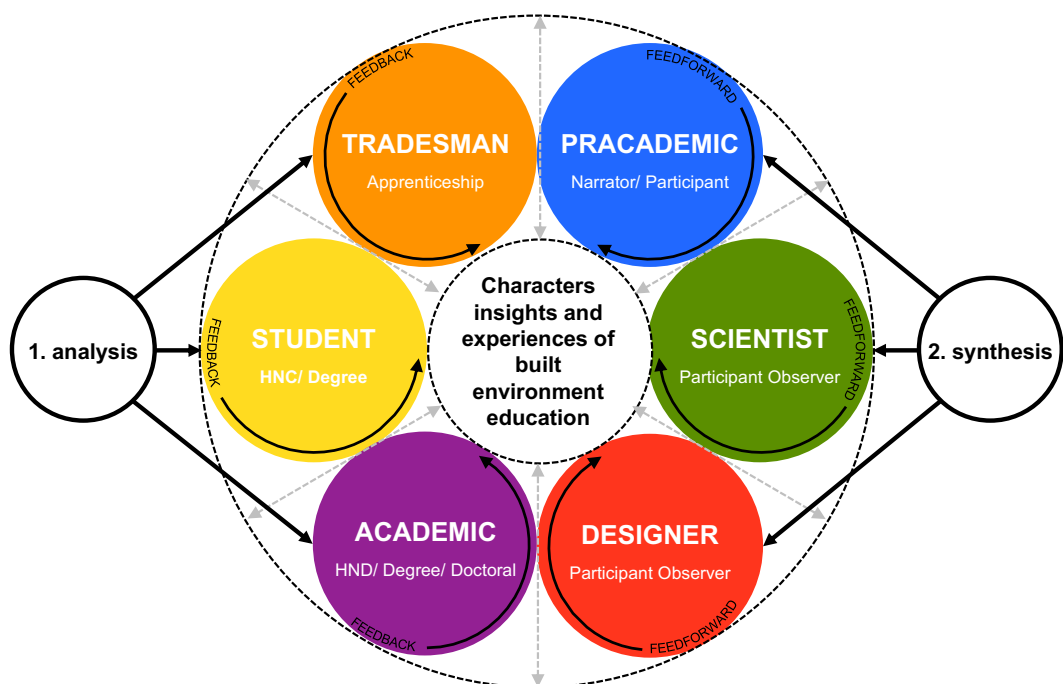

Figure 6.1 – Systematising a story between characters to bring analysis and synthesis together. (By author).

⬤ **Creating a favourable environment for learners and *'scaffolders'***

The pracademic thanks everyone for coming, feels a bit of a *'mad world'* with coronavirus at the moment, so it's good to be able to sit here with some of you; hopefully those of you joining us virtually won't have any technical issues, we'll probably be a couple of hours. We'll have a break midway, the most important thing is getting you all contributing to the *'conversation'*. I appreciate you're all coming with different perspectives, but relax, feel free to chip in and don't be afraid to ask questions at any point. I'm going to hand us over to the designer, who with the scientist is supporting me to facilitate this session.

The designer introduces himself and quickly moves to Fig. 6.2 which includes the six *'core principles'* and eight *'elements'* of andragogy (adult education). At this stage the focus is on the three *'elements'* highlighted in black, I'm just getting you to start thinking about what you have to offer through your experiences as we progress.
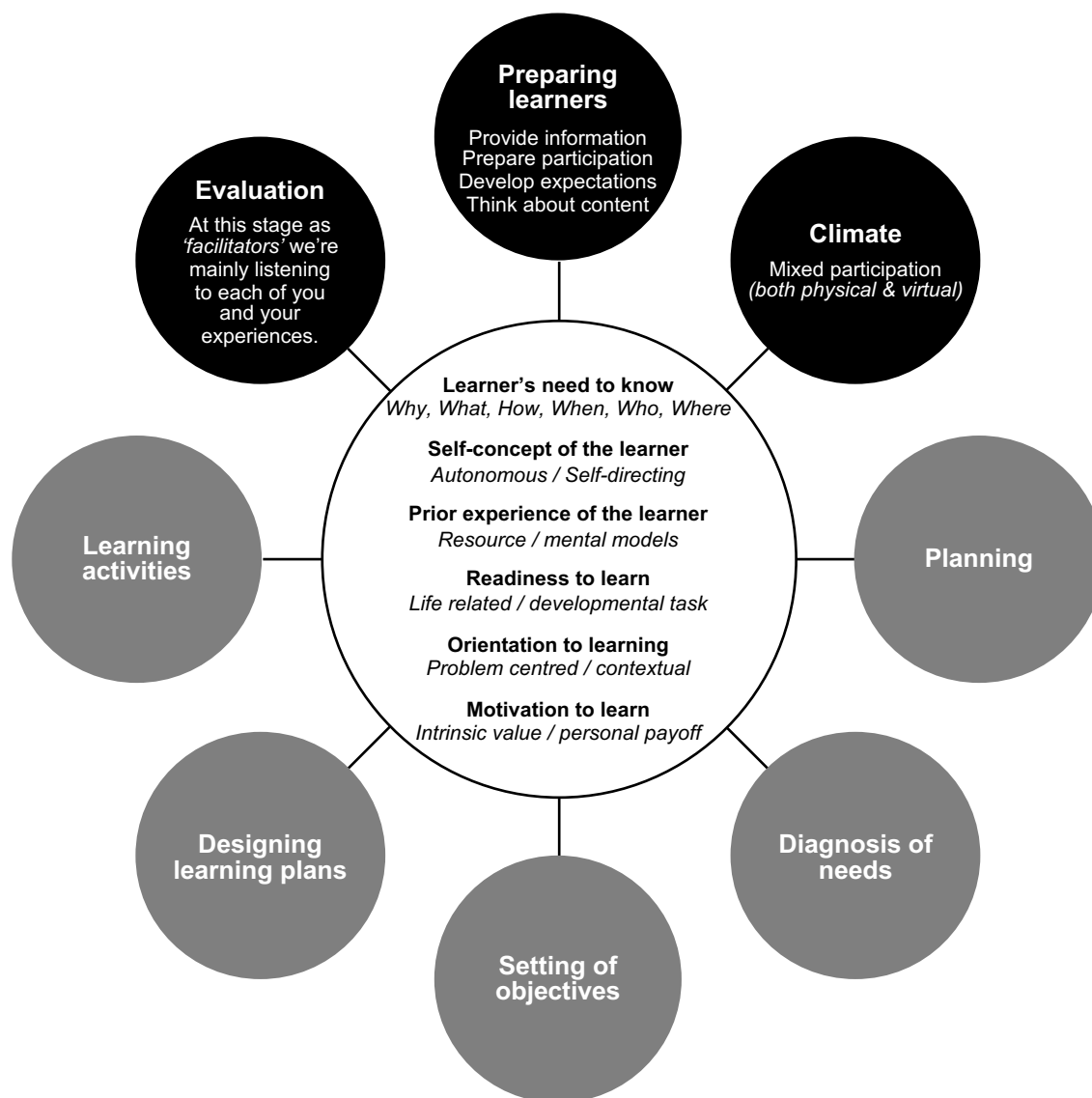

Figure 6.2 – Bringing in the core principles and elements of andragogy to support the session. (By author, informed by Knowles et al, 2015).

I would like you all to consider Fig. 6.3 with Fig. 6.2 (p.160). I want to quickly get us into the mindset of the work of Maria Montessori; which if you've done the pre-reading (chapter 4, p. 113-120 and p.125) you'll have some understanding of her, the pracademic will expand on aspects of her work as we progress. An immediate focus is on *'three interrelated components'*; *'the child/ adult (student), the teacher (facilitators/ scaffolders), and the favourable environment'.* We're operating within a mixed-participatory environment, three of us here in this room (designer, tradesman and the pracademic); whilst three of you are participating virtually (student, academic and scientist).
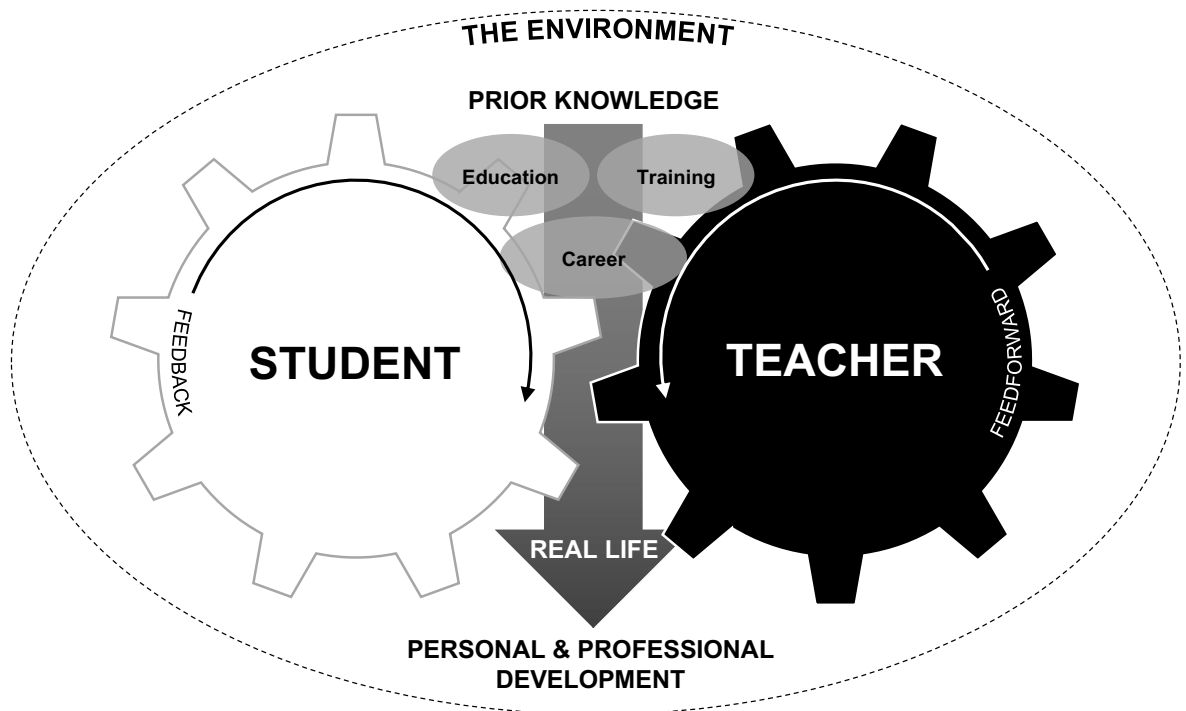
Figure 6.3 – Characters as students and teachers (By author).

What we're actually interested in is the different experiences you bring of built environment education; the pracademic will ask questions to hopefully unlock insights from each of you (tradesman, student and academic). What I want you guys to think of with Fig. 6.3 is that you're all students and all teachers in some capacity in this *'conversation'*, each of us both *'feedbacks'* and *'feedforwards'*; helping us all develop a better understanding of your prior knowledge and real-life experiences and deliver a range of insights into built environment education.

We have *'geared'* up this conversation for want of a better word (Fig. 6.3), so that you feel comfortable, which should help us to explore any insights you provide. As facilitators, we're working towards providing recommendations to re-imagine built environment education, which you will be contributing to. But we importantly want to ensure we are not leading you too much, so I'll hand you back to the pracademic and let him continue.

● A Montessori Man-child

Thanking the designer for the brief overview the pracademic continues, he's been preparing to chat with the tradesman; thinking he may well be the one asking the *'naïve and awkward'* questions (Wellington, 2015, p.104). *"Ok, first of all I'm going to chat with the tradesman, but whilst you're listening feel free to cut in, or let me know if you have a question"* says the pracademic. The pracademic and tradesman have talked previously before this session and continue the conversation now; the pracademic particularly interested in his apprenticeship asks the tradesman if he can think back to this. *"Crikey it's a few years ago but what do you wanna know, or where do you want me to begin?"* asks the tradesman. *"First I'm interested in the transition from school to apprenticeship, if you can do that we'll go from there"* replies the pracademic.

The tradesman shuffles around in his chair: I can remember being pushed into it, being told I had to do something having left school; I hated school didn't really know what I wanted to do. I could have stayed on to do the so-called *'spiv's'* course in sixth form, CPVE I think they called it. But to be honest I was fed up and become a bit despondent and disillusioned; I'd spent three years in high school, got crap grades and just wanted to get out so went to college. There was a gap between school and getting my apprenticeship, I worked for some guys I knew through football, labouring on building sites; I earned a few quid, had some beer money which helped me go out and live a bit. I had various weekend and holiday jobs from about 13 or 19 years old also, so I've always grafted because basically if I wanted to do anything, I had to earn it.

Anyway, I got a carpentry and joinery apprenticeship, the majority of which was in a joinery workshop; I changed to day release from what was meant to be full-time, but I didn't really enjoy college. *"Why?"* asks the pracademic. It just felt like school, it was practical but some of it was classroom-based which I hated; studying just felt like a chore so I just went through the motions with it. *"If it was more practical why did you struggle with it?"* asks the academic. *"I was just going to ask that very thing, but I was going to ask did you see college as a waste of time?"* adds the pracademic. I suppose there was an element of it feeling like that, even the practical stuff at times felt like it was a few steps back from work; a bit pedestrian and boring. The pracademic thinks for a moment *"I think as a student coming out of school your attitude to learning was probably closed off, it's likely you may have developed a fixed mindset to formal learning, I've come to understand this a little through Didau and Rose (2016, p.126) who state"*:

> *"In essence, the fixed mindset may be an adaptive response, an evolved strategy preventing us from 'wasting' effort where we have experienced frequent failure and the opportunity for future success is low, and encouraging us to invest effort in areas where it may be more likely to pay off for us".*

The pracademic continues *"it could be through the combination of your school and work experiences that your attitude to formal learning evolved the way it did"*. The tradesman sits forward: so, thinking of myself as a failure at school contributed to my attitude that learning anything new was a *'waste of time'* then basically? *"It could have yes, but we would have to look at this more robustly, a topic in itself; however, from this it may be useful to discuss your work environment at the time and assessment may be a contributory factor to how you viewed formal learning"* replies the pracademic.

I spent most of my time in a joiner's shop, it's what I remember most; at first, I found it challenging physically and mentally, always on my feet and it felt a bit monotonous. I worked mainly under two joiners together: a right couple of characters. If you made mistakes, you certainly knew about it, the odd flying object now and then shall we say; I developed a sixth sense for dodging them. I learnt to argue back better, got sacked once or twice, banished from the shop, *'sold'* to a delivery truck driver, just banter at the end of the day. But joking aside if you made a mistake it had to be sorted in order to get whatever you're doing made, joinery is very process-driven; on reflection, it's probably what shaped how I see things. *"So, assessment and feedback were instant then?"* says the pracademic. I guess so, yeah. *"Have you heard of reflexivity?"* asks the pracademic. It's some exercise class or something ain't it? The others burst out laughing, the tradesman slowly joins them and asks, *"what did I say?"* as the laughter dies down. *"That's reflexology, I think you mean, that's something else"* says the academic. *"Sorry, we assumed incorrectly you may know what reflexivity is"* adds the pracademic. *"I didn't really know what it is either, I just laughed cos you guys did"* says the student.

The pracademic stops for a moment, ok let's address this so we're clear. Adams, Holman-Jones, Ellis (2015, p.2) outline reflexivity as deep and careful reflection. The tradesman pipes up *"fair enough"*. *"There must be more to it than just reflecting?"* adds the student. Wellington (2015, p.101) states "*being reflexive is part of a more general approach to reflection'; 'reflexivity involves reflecting on oneself"*. Etherington (2004, p.19) states *"to be reflexive we need to be aware of our personal experiences, and to be able to make choices about how we use them"*. The academic says *"I reflect when I take a lecture, then go away and reflect on how it's gone. I'm reflexive when I stand in a lecture, observe what's happening and make changes, if necessary"*. The tradesman sits forward *"so, basically, I need to be able to read a situation, know how I impact myself and others, weigh up the options and make a correction. If I cock-up making a window, I can leave it cocked up and come back to it; or sort it out there and then"*. *"There's a combination of reflexivity and praxis here, but I think you get the gist"* replies the pracademic. *"Ok, I'll take your word for it"* replies the tradesman.

Continuing the pracademic comes back to the theories and methods of Maria Montessori and her value to built environment education: she had some concerns with teaching through repetition and focused on developing exercises to help the senses (Bates, 2016, p.62). I actually feel repetition is a good thing in some instances, it's evident that the range of senses you were clearly using weren't empathetically supported. If we take your (tradesman) joinery shop experiences for example, you considered it *"monotonous"*, you *'learnt-by-doing'* in the process, received instance feedback and was mentored by experienced craftsman who would have taught you intuitively. You possibly lacked *'scaffolding'* in more formal learning environments; prior experiences of school maybe weren't sufficiently assessed, meaning you struggled at college. Assessment of your workplace environment by educators may have offered a greater opportunity to develop your reflective skills, which may have opened your mindset up to learning in a formal environment; but we need to remember we've only your *'memories'* of the account.

The pracademic continues; Montessori's theories evolved naturally over time, she observed *'children were learning in a largely didactic manner, working from a curriculum designed for societal interest rather than the needs of the child'* (Aubrey and Riley (2016, p.20)*. The tradesman, student and academic, agree it's representative of a significant amount of their built environment education. The academic adds *"but I still feel there's a balance to be struck, that it's necessary to take a didactic approach at times"*. The pracademic nods agreeably *"however, I do question the 'one-size-fits-all' that comes with a didactic approach, especially in higher education"*.

The tradesman pipes up; *"I like this Montessori lady, looking over this book (Bates, 2016) she seems to know what she's talking about, her observations seem like common-sense; she focused on children but why do we educate adults like this?"*. The pracademic replies *"that's a good question,* as *we progress, we'll gain a better insight into this"*.

The student mentions that his dissertation explored the internal environment of schools; *"researching the work of Montessori may have been useful to nuance the educational and architectural perspective better"*. The pracademic noting a theme suggests *"we can come back to this if necessary"*. The student adds *"I researched schools at primary and secondary level, focusing on how learning environments are impacted by a range of stakeholders"*. The pracademic says *"this does sound interesting, there are some interesting insights to explore with learning environments and how they impact physically; however, I'm not sure it will inform us currently"*. The student suggests *"I could offer some insights from doing my dissertation when it suits?"*. The pracademic replies *"there may be more benefit in re-visiting this at some point"*.

"Tell me a little more about the relationship with the joiners" the pracademic asks. On reflection I'd say, great people and environment to work and learn in, tolerant but firm and plain-talking, we had many lively debates in the tearoom banter. If I think of them as *'educators'*, they certainly influenced my life; I grew up with them, *'eventually!'*. As a *'council-house kid'* from a single-parent family growing up, I'd say empathy resonates most with me from this period. In learning and working with the wise, serving and seeing others in the wider community who aspire to be more; I see others more capable than myself, only limited by a lack of belief, opportunity and value judgements made by others.

"Something for us to reflect on, thank you" the pracademic replies, who continues to ask, *"I want to pick up on the observations of Montessori you (tradesman) were looking at in Bates (2016); what do you think about these?"*. The tradesman goes through them (Fig. 6.4).

Main discoveries of Montessori's observations	Tradesmen's thoughts on Montessori's observations
Young learners (from birth to around age 6), in particular have an 'absorbent mind', during which time their motivation to learn new things is limitless.	I feel like I got my 'absorbent mind' more as an adult in mid-twenties. I wasn't motivated to learn or should, or I wasn't conscious/ aware of how I learnt really.
There are a number of 'sensitivity periods' of development during which time a learner's mind is open to learning new skills or knowledge.	I've certainly had 'sensitive periods' mostly when I'm told to learn something, which possibly comes from school; if want to learn something I will do it.
Movement enhances thinking and learning.	I do think best when I am doing stuff and moving, even reflecting while travelling (daydreaming), however, I would say it's when I'm static I learn more.
People learn better when learning is relevant to them.	Without a doubt. I learn best when I organise my own 'boxes' if I'm being honest. We can get in the habit of just processing stuff, which we're not really learning.
All learners are capable of self-directed learning.	I think I have always been capable, but do at times need help to self-direct myself; which really comes with your own experience, we're all different.
Learning is improved if there is a sense of control or order within the classroom.	I would agree, I think its better to learn with fewer people. But I think I learn more meaningfully on my own, when I can concentrate on what I'm doing.
Learners learn best from self-discovery and making mistakes.	Isn't this where the learning is? If you always get it right then something wrong isn't it? It's a problem though if you keep making the same mistakes.

Figure 6.4 – Comparing Montessori's main observations that informed her theories with the tradesman's thoughts on them (by author, informed by Bates, 2016, p.62).

The pracademic reflects on Fig. 6.4, some great points I'll focus on the first: I touched on Montessori's *'four planes of development'* (p.114), a potential limitation is the age bound nature of them; I think you (tradesman) highlight this, you say an *'absorbent mind'* stage came in your mid-twenties, not possibly as Montessori would arrange them; so, we need to think cyclical not linear. We need to keep this in mind because I think you may suit learning styles aligned with Montessori's theories and the principle of the *'planes'*; however, I think they need re-imagining but I'm not sure how yet.

"If I may, can I offer something that may interest you?" asks the tradesman. *"Yeah of course carry on"* replies the pracademic. A few years ago, I took one of my kids to Ajax for a soccer camp, we spent a week at De Toekomst in Amsterdam. I've always played until injured; I think the model Ajax use is based on this Montessori lady's methods. *"Unexpected, but just elaborate further please"* asks the pracademic. You highlight that Montessori's methods focus on three interrelated components: '*the child, the favourable environment and the teacher',* here's some photos off my phone (Fig. 6.5); I made a series of YouTube videos if it helps? *"Maybe, but ethically this may create issues"* suggests the pracademic. *"No worries"* replies the tradesman.

Figure 6.5 – Personal photographs from Ajax's international soccer camp in 2017 (By author).

This camp had kids from 6 up to 17 or 18 years old, each cohort was relatively small, with kids coming from all over the world; loads of them. There's a clear partnership between the teacher and students, De Toekomst is an inclusive and friendly place offering a range of environments (Fig. 6.5); Ajax's first team and youth teams train there; whatever age group, they were all being trained or developed the same way through Ajax's TIPS model, it's on YouTube (SportLab, 2016). *"What does TIPS stand for?"* asks the academic. It stands for *'Technique, Intelligence, Personality, Speed'* replies the tradesman. The *'pracademic'* asks the designer and the scientist to investigate further as we continue, he asks the tradesman to carry on.

The tradesman continues: the kids develop skills over a week, teachers assess each one continually from day one, make adjustments to reflect an individual's abilities; even change age groups if necessary. It's a combination of tests, skills, drills and games in a range of different environments such as squash courts, indoors, street soccer. *"If everybody is all learning the same way, isn't it a bit boring or limiting?"* asks the academic. The pracademic recaps criticisms of Montessori, discussed in chapter 4 (p.116); *"a lack of creativity and imagination, a Montessori child is an 'isolated worker', operating in an environment where 'playing with the didactic material was strictly prohibited (Kilpatrick, 1914) what do you think of this in the context of Ajax?"* he asks. Is a football and training drills *'didactic material'*? It wasn't evident any kids were *'isolated'*. The TIPS model if anything helped instil discipline, spontaneity and creativity had space to flourish; it's like the system or model is present but not there if that makes sense, underpinning the process.

166

The pracademic curious asks the designer and scientist about the TIPS model, the designer says, *"it's difficult to find information beyond the model itself but Ajax's youth program has produced an abundance of talent over a long time, Johan Cruyff considered its most famous product"*. *"I read an autobiography on Cruyff over the course of that week, it's an interesting read: some great insights"* says the tradesman.

Cruyff (2016, p.30) refers to *'always being interested in the process',* and *'If you're able to analyse the next step then you had a chance of making the next step successful'*. *"This is useful to consider with built environment education"* says the pracademic. Cruyff (2016, p.34) highlights all successful teams have *'a solid core derived from their own youth teams, players who have the club's DNA inside them always bring something extra as well'*. *"So, we could think of this with graduate attributes: artefacts"* the pracademic thinks out loud. The scientist chips in *"Reilly, et al (2004, p.174) discuss Ajax's TIPS model highlighting it includes methods for monitoring, assessing, recording, and reporting; a precedent for other models using the acronym approach. They highlight there are 10 sub-components but don't detail them (p.206); but on (p.207) they state"*:

> *"Whilst these criteria recognise certain attributes for success, the judgements of coaches and talent scouts can be speculative and subjective. More recently, these criteria (craft judgements) are being supplemented with objective measures offered by sports science techniques".*

"There's certainly synergies with built environment education" suggests the academic. The tradesman says *"being 'reflexive', it sounds like my apprenticeship; college assessment and being at work, especially the craft judgements"*. The academic comments *"that's summative and formative assessment"*. The pracademic ponders for a moment; *"actually it's more summative assessment and formative feedback, there's a difference; craft judgements I see as mentoring or nurturing change in the practice of students whilst in the process; I would say formative feedback focuses more on the person than assessing the work itself"*. The academic accepts this and goes away to reflect on how assessment could be improved, he is still thinking of built environment education.

"Actually, this example of Ajax is good perhaps if working with small cohorts, but at times I've had modules with 150+ students, plus supervisory and personal tutoring commitments; I'm lucky if I get to know their names or talk to them, I might know 30 to 40% but not necessarily for the right reasons" suggests the academic. *"A valid point but hold that thought we'll come back to it; I want to touch on cohort sizes perhaps with the student and his HNC next. It's this idea of a total system or acronym model that intrigues me I see a range of synergies, but I'll let it sit with me for a bit"* says the pracademic, who thanks the tradesman for something unexpected to reflect upon again when wrapping the session up.

🟡 **Clearing out and re-building the *'toolbox'***

The pracademic turns to the student on the screen *"hopefully you've been able to find and scan your HNC certificates?"*. *"Yes, I have them"* replies the student on the screen. *"We can't hear you, unmute your mic"* asks the pracademic. *"Sorry, yeah I have them"* says the student again. *"Can you share them with the scientist and designer then please, we just need to anonymise it where necessary; before we all look at them, we'll continue"* says the pracademic. *"No probs"* replies the student. Continuing the pracademic asks the student to consider the core principles within Fig. 6.2 (p.160) derived from Knowles et al (2015, p.6): *"consider these and briefly tell us about the transition to college and doing your HNC"*. *"Ok"* replies the student.

I was 27 years old, had lived a little and was changing jobs; to a technical office-based role; a career change came more from personal circumstances than professional need. I suffered an injury and spent 6-7 months off work, an HNC was offered to me as part of my new job. *"What was it like starting your HNC?"* asks the pracademic. It was a bit odd going back to college, but I actually had a couple of months doing my HNC before returning to work; this really helped, I was motivated to learn, but more importantly, the momentum developed quickly. We began with general IT applications (Word, Excel, Access, etc.) and AutoCAD in 2D and 3D, this was an interesting period, I'd never really used a computer which was going to be part of my new job as well; so, feedback from early assignments helped to build the momentum:

> *"In terms of producing an individual approach to presentation you have taken the crown. I have watched you get to grips with this programme and I have been very impressed with the way you have quickly developed your skill in using not only this programme but all that computers have to offer. Well done".*

> *"This is exceptional work. I like to think that I pointed you in the right direction in terms of using AutoCAD, but you have definitely mastered the use of this programme. The proof of this is in this assignment".*

"How long a timeframe was this over?" asks the pracademic. In respect to IT and AutoCAD assignments, three over 5-6 months based on assignment dates; we had others as well with a few duff ones, I got a referral and merits in some other topics. *"Did you focus on the IT ones?"* asks the pracademic. Yeah, AutoCAD particularly. *"Interesting, this could be the result of previous experiences of your formal education, there's a transition here between having a fixed and growth mindset to learning"* says the pracademic. What does that mean? The pracademic continues *"well as we saw with the tradesman, he'd possibly developed a fixed mindset as a result of failing at school. On receiving positive feedback on performance, you've started to develop a growth mindset to learning; however, you still possibly invest more in certain areas, some of your failures or lower marks are through lack of effort rather than your lack of ability"* (Didau and Rose, 2016, p.126).

The student reflects for a moment: I think in reality it's a combination of both possibly? *"Ok what were the learning objectives for the unit you got a referral?"* asks the pracademic. The student hunts out the assignment, bear with me, ok here we are:

> *"Outcome 1 - Investigate and apply scientific principles to construction, structural, environmental and service operations and determine comfort levels in the design and use of buildings".*

"That's an outcome clearly, no objectives?" says the pracademic. No objectives, it's the only outcome other than the common skills framework, which the tutor didn't complete. I don't have a brief, but the assignment is split into two parts: Part 1 was a case study, for which we had to write about the effectiveness between the designer and the building users; part 2 considered building performance to Building Regulations Parts E and L. *"Ok, it made me think about constructive alignment with assessment, I'll leave that for now. Tell us some more about the common skills framework"* says the pracademic. It's a continuous process throughout the HNC, in each assignment we had to evidence how we met them. The designer cuts in *"we cropped and anonymised the 'Notification of Performance' certificates you (student) sent us (Fig. 6.6); we've broken down the two years of your HNC based on the progress outlined in the certificates, which highlights the common skills framework or 'profile'. We've attempted to categorise topics into design, management and technology"*. The pracademic asks *"why categorise topics?"*. *"Something we're just continuing to look at, we'll come back to you"* replies the scientist.

Figure 6.6 – Extract of HNC Notification of Performance certificate, with topics categorised into design, management, technology and personal and professional development. (By author).

The pracademic focuses back on Fig. 6.6: *"How many assignments did you do for your HNC?"* he asks the student. I have 18 physical assignments; I don't think that's all of them; the common skills framework is within each. *"So, we're looking at units not assignments in Fig. 6.6; categorisation of topics, umm!"* the pracademic thinks to himself.

I've just scanned part of a blank common skills framework if it's useful (Fig. 6.7). *"Yeah, put it up"* says the pracademic. I've just cut off the *'evidence, O/A (overall) grade and tutor's signature'* columns; they're blank anyway. *"Can I presume as it's blank that the process wasn't completed?"* asks the pracademic. Possibly, it's one assignment in a unit, we tended to evidence and discuss unit progress with tutors. *"There's no built environment education references within it, it's free of disciplinary ideologies; it's good it runs right through course and is credit-bearing"* says the pracademic.

COMMON SKILLS

Common Skill	Outcome	O C ✓
Managing and developing self	1 Manage own roles and responsibilities 2 Manage own time in achieving objectives 3 Undertake personal and career development 4 Transfer skills gained to new and changing situations	
Working with and relating to others	5 Treat others' values, & beliefs with respect 6 Relate to and interact effectively with individuals and groups 7 Work effectively as a member of a team	
Communication	8 Receive and respond to a variety of information 9 Present information in a variety of different forms 10 Communicate in writing 11 Participate in oral and non-verbal communication	
Managing tasks and solving problems	12 Use information sources 13 Deal with a combination of routine and non-routine tasks 14 Identify and solve routine and non-routine problems	
Applying numeracy	15 Apply numerical skills and techniques	
Applying technology	16 Use a range of technological equipment and systems	
Applying design and creativity	17 Apply a range of skills & techniques to develop a variety of ideas in the creation of new/modified products, services or situations 18 Use a range of thought processes	

Figure 6.7 – Extract of blank Common Skills Framework from an HNC assignment. (By author).

The academic asks *"how many students were in your HNC cohort?"* I'd say no more than 20 students (Table 5.2, p.145). *"Ok so significantly smaller cohorts than I've typically dealt with"* replies the academic. *"If focused on higher education scale may be a problem, but I'd say it's more about time; however, I see a bigger problem being that there's no framework like Fig. 6.7 at undergraduate level"* states the pracademic. *"I don't disagree with you, but as I've said previously, I've dealt with modules that can have 150+ students"* replies the academic. The pracademic quickly responds: *"ok, forget scale, we can even forget built environment education for a moment. The questions I put to you are how do you actually know if students are capable as learners, that your assessment methods work, or that your programme is any good? How do you know they're not just mimicking learning outcomes to get from A to B? (p.144) without something like Fig. 6.7 embedded in the process?* The academic pauses *"I take your point"*.

170

"I think it would be interesting to explore built environment education at degree level and re-visit some aspects we've discussed before (chapter 3)" suggests the pracademic. *"Why?"* asks the academic. The pracademic continues *"Well let's take the Ajax model, there's a mechanism to support 'craft judgements' of teachers in the process; it informs assessment of performance <u>with</u> students themselves. The HNC common skills framework (Fig. 6.7, p.170), does a similar thing. At doctoral level there's a researcher development framework (RDF) for individuals to evidence performance. Both HNC and doctoral examples are possibly not as responsive as the Ajax model, which in my view highlights a problem with built environment education; too much time is put into the wrong areas, in planning/designing curriculum without the student's themselves to the detriment of the process or the experience itself"*. The tradesman chips in *"it's what makes this Montessori lady so interesting isn't it?"*. For a second the *'sound of silence'*. *"Why do you say that?"* asks the pracademic. *"Don't get me wrong, I'm only going by what I'm reading here while you guys are chatting away; I'm listening but this fellow Bates (2016, p.63) highlights being a 'Montessorian' you need to appreciate*:

- *"That people thrive on order and structure, so ensure everything has its place and that the learning environment is as accessible as possible for people to work in.*

- *Individuals will have peaks and troughs in their responses to your teaching. Don't assume that people are learning at the same intense rate as others. Have a strategy for dealing with both high- and low-intensity individuals in the same group.*

- *Make your learning materials appeal to as wide a range of sense as possible.*

- *Encourage people to develop as spontaneous, creative individuals by allowing them to view situations from different standpoints, take risks, make mistakes and follow their natural impulses.*

- *Allow individuals the freedom to work alone on certain activities but don't forget to urge them to share their learning experiences with others. in this capacity, appreciate your role as a facilitator."*

The tradesman adds *"whether it's school, joinery shop, HNC or Ajax we all learn differently, bring different perspectives from different environments, it just comes down to justifying reason or logic at that moment in time. As the designer set out in Fig. 6.2 (p.160), there's three things coloured black, which don't include 'planning, diagnosing, setting objectives, designing learning plans or activities. A common skills framework makes sense, it's the 'toolbox' helping individuals explicitly show the 'tools' they've developed in the process; a simple way to have a 'conversation' and give evidence from their own perspective, and not in response to somebody else's learning objectives or outcomes. Sorry, I'm rabbiting on"*. *"No that's ok"* replies the pracademic. *"That would take a lot of time with large numbers"* says the academic. *"It's just a matter of design"* suggests the student. *"On that note let's bring in the designer and the scientist"* adds the pracademic.

● A framework to assess the evolving artefacts

The scientist unmutes his mic *"I think the tradesman sort of hit the nail on the head"*. *"How so?"* asks the pracademic. The scientist continues: built environment education is complex; we largely assess people in an educational environment, through programmes optimised for academia not industry. We try to synthesize practice through learning objectives and outcomes to assess and make judgements on performance, by seeking optimal outcomes (grades) in one environment (education); how does it benefit the performance of students in another? The common skills framework is like an introduction to continuing personal development (CPD) which is important to built environment education, the principle of which is embedded into the HNC; we can see this in the *'notification of performance'* certificate (Fig. 6.6, p.169). By design the common skills framework is principally concerned with finding satisfactory outcomes, not optimal ones: Simon (1996, p.120) states:

> *"In the real world we usually do not have a choice between satisfactory and optimal solutions, for we only rarely have a method of finding the optimum".*

By design, built environment education mainly evaluates on how well learning objectives or outcomes are met; value judgements are made on how students meet them, inferences are made which can impinge on identifying what learning has actually taken place. It's *'when we concern ourselves with finding satisfactory design solutions, rather than optimal ones; that when the goals to be achieved are aligned, both the process and the artefact is reflected in the final design'* (Simon, 1996, p.130). The common skills framework (Fig. 6.7, p.170) is an expository instantiation meaning as an artefact it's both representative of theory and offers a means to test it (Gregor and Jones, 2007); I'm talking of design theory here. Simon (1996, p.130) offers something else which resonates:

> *"An architect who designs buildings from the outside in will arrive at quite different buildings from one who designs from the inside out, even though both of them might agree on the characteristics that a satisfactory building should possess".*

There's always two *'architects'* in a conversation, it's how we reason with ourselves and others to arrive at consensus, which I suggest makes the common skills framework a valuable mechanism in the learning process. In using learning objectives/ outcomes, staff are only likely to be evaluating a student's ability to meet them, which isn't a true measure of learning in reality. The common skills framework (Fig. 6.7, p.170) offers agreement of the characteristics that have been met in evaluating the performance <u>with</u> students themselves; it's an expository device that can transcend a period of study itself and be a tool that offers lifelong utility, it's what any other assessment of an individual should be built around basically. It can also be a way for experiences of practice to *'feedforward'* and inform following periods of study; after all, we all come with experience, it's just a case of how it's mobilised and valued in the process of *'feedforward'*.

"That's really useful, thanks: it's made me think of constructive alignment again" says the pracademic. *"what's that?"* asks the student. *"I'll come to this when I recap at the end if it's ok with you, I'd like us to take a break for a moment"* suggests the pracademic. *"Cool with me"* replies the student. *"Yeah, me too"* says the tradesman. *"I need to check some student emails quickly so that works for me"* adds the academic.

The pracademic continues a conversation with the scientist and designer: *"right gents what is it you're working on?"* he asks. The designer sitting with the pracademic says *"we've been chatting in a separate breakout room, looking at units outlined in the students 'notification of performance' certificate (Fig. 6.6, p.169). We're interested in the 'Design Principles and Application' unit: what's in it? We're exploring to see if there's a link here with a module you outlined in chapter 5 (p.138) which focused on industry methodologies; we're seeking out something that Simon (1996, p.138) says*:

> *"the proper study of mankind is the science of design, not only as the professional component of a technical education but as a core discipline for every liberally educated person".*

"Wrong focus gents" replies the pracademic. *"Why do you say that?"* asks the scientist. The pracademic continues *"think back to invisible architecture in chapter 5 (p.138), the common skills framework as you've (scientist) touched on is what crystallises a student's learning, for other assessment to be built around".* *"Ok carry on"* says the scientist.

The pracademic continues: *"potentially units/ modules at most levels of built environment education are measuring courses, not students. But by design or instruction, units/ modules offer prescriptive knowledge if you think back to Fig. 4.13 (p.105), they prescribe a 'method' of how to create artefacts of them (student submissions). "Design" is both a noun and a verb, I feel courses are testing their own 'methods', not the 'products' (students). Courses I believe are testing themselves, defining the guidelines and process they're really evaluating artefacts they themselves created; we potentially assess incorrectly or unnecessarily. In essence, the common skills framework is an instantiation (Fig. 4.13, p.105), a working system or template that evolves with the learner themselves. For example, previously (chapter 3) the academic highlighted the CIC criteria, as well as RIBA's general criteria (GC's) and graduate attributes (GA's); GC's help course teams develop content; however, it's the GA's that guides learners and informs how both them and a programme is evaluated; but in my experience GA's are overlooked as an assessment tool. There's 6 GA's for Part 1 (Fig. 3.19, p.74); how many assessment points do you need to realise them? The HNC common skills framework is possibly more useful as an instantiation, it can develop as an artefact; one representative of both the process and learner, it evidences knowledge is embedded within both of them."*

"I can see that" says the scientist. *"Yeah, me too"* replies the designer. *"However, we can only explore and test this so far in this investigation"* suggests the pracademic. *"We've been looking at something else, which kind of touches perhaps on your point about assessment"* says the scientist. *"Ok what have you got?"* replies the pracademic.
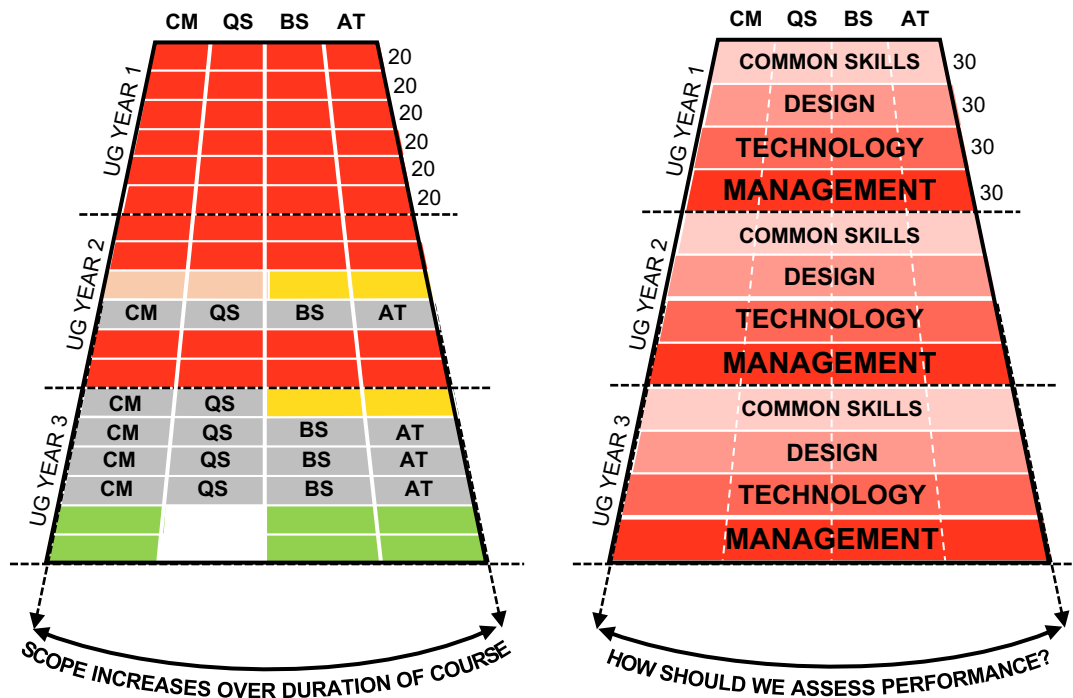

Figure 6.8 – Developing analysis from Fig. 3.8, p.61 to discuss topic harmonisation to suit disciplinary need and highlight the divergent nature of courses. (By author).

The scientist shares Fig. 6.8: I've been exploring the academic's analysis of comparable built environment education courses, Fig. 3.8 (p.61) in the left-hand image. Typically, a course increases in complexity as students' progress from year 1 to year 3. But also, typically semesterisation and modularisation limits proper use of pre-requisites and co-requisites; modules are generally *'siloed'* by design. The left-hand image is considered a low module institution when compared with Fig. 3.7 (p.60), an assumption made is it would have 66 assessment points (Fig. 3.8, p.61).

The right-hand image in Fig. 6.8 represents some initial comparison with the HNC and Fig. 6.6 (p.169), we began to discuss topic harmonisation across disciplines; how courses could be simplified; how the transition from a technical to *'higher'* education should develop. *"I do question what 'higher' really means for built environment education"* adds the pracademic. We wanted to highlight the divergent nature of courses, if *'siloed'* modules only increase in complexity how do we really know if learners are learning and courses are performing? *"So, by design undergraduate courses may not have the 'tools' to measure learning gain for example?"* asks the pracademic. There may be mechanisms in place, but not as explicitly so as the HNC I would suggest.

"So, would you say that the HNC by design offers the more coherent learning experience?" asks the pracademic. We would have to explore HNC and undergraduate courses more thoroughly, but yes, we feel the HNC offers greater clarity as a product; use of the common skills framework within the HNC is clearly integral to its success as a programme.
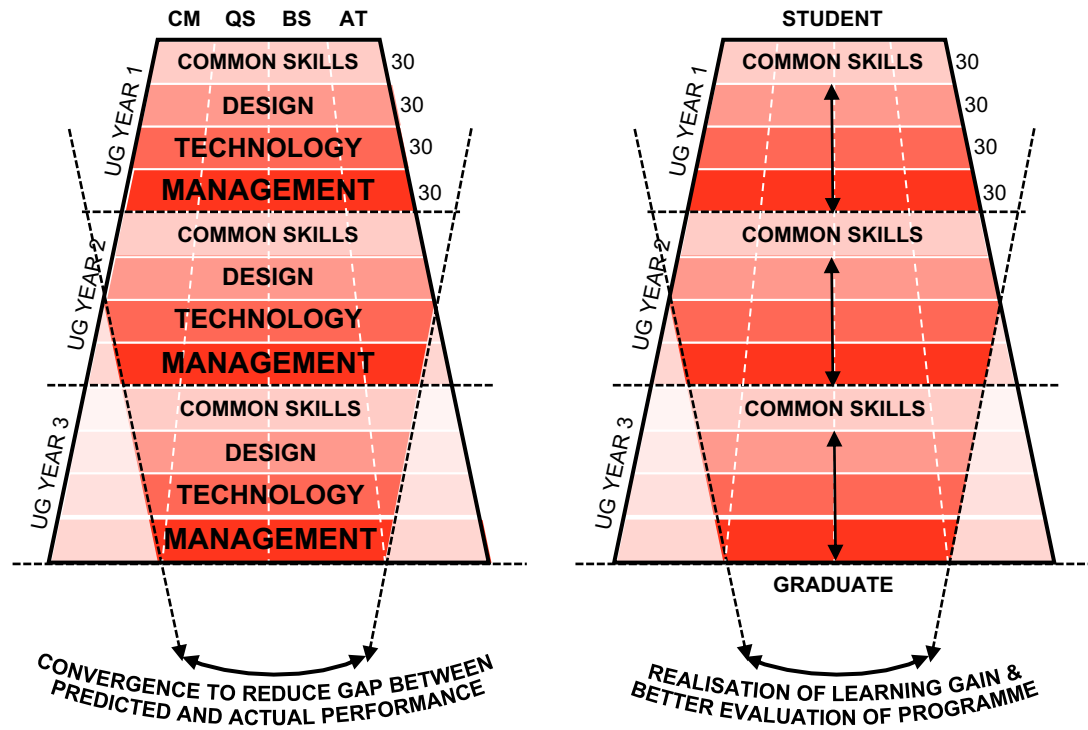

Figure 6.9 – Importance of convergence in design of programmes to bring synergy to realise learning gain and evaluate the programme itself. (By author).

The tradesman, student and academic come back: the pracademic quickly recaps the conversation with the scientist and designer; *"all clear?"* he asks. *"Cool with me"* replies the tradesman. " 👍 " from the student online. *"I'm good, Fig. 6.8 (p.174) is interesting especially if going a step further (Fig. 6.9); I looked at courses generally, didn't appreciate the divergent nature of them"* replies the academic. *"I put Fig. 6.9 up but hadn't discussed it yet, but I'm working on highlighting the value of the common skills framework being embedded in every year; to better evaluate learner's as well as programmes (Knowles et al, 2015, p.66).*

From courses you (academic) looked at did they have modules or anything like the common skills framework?" The scientist asks. *"Not explicitly in every year I'd say, it could be it is hidden; year 1 generally tends to be relied upon for skills development modules"* replies the academic. *"Ok, thanks"* the scientist says whilst taking notes. The academic sits looking at Fig. 6.9, *"the common skills framework is almost like the critical path of a student journey to graduation, it makes me think of my RDF and annual reviews for my DProf"*. *"I know what you mean. Anyway, I would like to re-visit your (academic) idea of 'output theory', which we discussed previously, I think it will bring things together"* the pracademic replies.

● Designing for adaptable students, graduates and professionals

The pracademic takes a sip of water and places the glass back down: throughout this investigation *'graduate attributes'* has been a continual thread in some form; the idea of *'output theory'* (chapter 3) has helped the story to evolve at different times. However, the reality presents something of a problem, tracking down my institutional *'graduate attributes'* of the time I'd like to think I'm an artefact representative of them. But being true to them I have to be aware of my *'personal responsibility'* ethically, meaning I cannot reveal the graduate attributes themselves, but I believe in the principle they serve. But from this we have to re-imagine how we use and embed them; we have to make generic statements useful in order to value them in the process; as a graduate I ask myself what constitutes a *'higher'* built environment education? How do we educate industry to best serve the future needs of society? To move us forward, I offer two quotes from Montessori (2007); bear-in-mind originally they are from the 1940's:

> *"Universities have gradually become ordinary professional schools, distinguishing themselves from other schools only by their more advanced culture. But they have lost the dignity and distinction that made them a central instrument of progress and civilization. Students whose aim is merely to reach a simple and obscure personal position can no longer feel that loft mission towards an ever-greater progress of humanity that once formed the 'spirit of the university.' The common object of the students has become that of evading work as much as possible. Their principal aim is almost exclusively that of passing examinations anyhow and taking the degree that will serve their individual interest. So, while there has been a progress of culture so great to transform civil life, the universities themselves suffered a decline."*

> *"It is in the very character of the university to 'learn how to study.' The degree is but the proof of knowing how to study, of how to seek culture alone and without help, of being set upon the path of scientific research. This is another proof that the essential task of the university is not limited to giving instruction. It is in order to study, that one has learned to study."*

The academic and student both speak, *"you first"* says the student. The academic continues *"thanks: in respect to the 2nd quote; is it still in the character of the university to 'learn how to study'? I think the character of them has probably changed, marketisation has had an impact but it's easily used as an excuse. In respect to the 1st quote and built environment education, I'd say many universities are 'ordinary professional schools' and too disciplinary focused; I can remember my first attempt at doing a degree, I hated it and dropped out with an HND"*. The pracademic cuts in *"Interesting, I might come back to this; you (student) had something?"*. The student unmutes his mic *"I went to Uni because of a lack of options and funding, as a mature student my initial focus was getting a better job in practice. So, I guess I kind of reflect what Montessori says in the first quote; I didn't 'evade' work, I just questioned how much I would use in practice and just wanted the qualification, but I guess you do whatever is put in front of you. In respect to the 2nd quote, I'd say I did 'learn how to study' but wouldn't say it was the focus of assessment"*.

The pracademic continues; universities are just artefacts of society; one of a number of *'black boxes'* impacting the learning experience of the learner; highlighted in Fig. 6.10. The point I want to make is that at undergraduate level the curriculum is too prescriptive; we don't, as the student highlights, *'sufficiently focus on learning how to study'*. We're too preoccupied with assessing what we largely already know, which isn't learning and goes against the *'character or spirit'* of what university should represent; we dumb down content, but we don't change the *'mechanics'*. I would suggest learning be designed <u>with</u> the smallest *'black box'* in Fig. 6.10, provide the tools to *'help learn how to study'* then let them explore all the other black boxes in Fig. 6.10 and more to see what they find, within the safety of learning environments with the expertise of others.
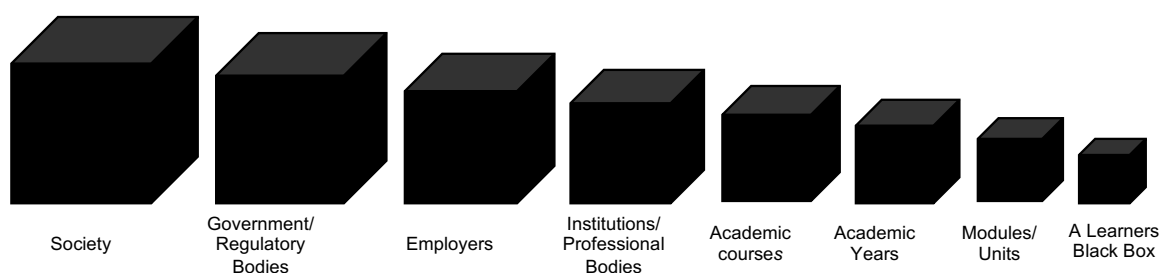

Figure 6.10 – Some of the 'black boxes' which influence the learning experience before the learner experiences their built environment education themselves. (By author).

The academic comments on Fig. 6.10: *"what you depict here is representative of society as a whole, we compartmentalise to identify and discuss different layers or 'black boxes', which gives them individual identity, but we don't appreciate how they influence each other. Socio-technical artefacts (Johannesson and Perjons, 2014, p.12) operate within a hybrid system and includes technical or material artefacts (laws, rules, etc.) and us (humans); how we look at them is arbitrary or should be in higher education if we think about those Montessori quotes some more"*. The student chips in, *"life technologically is more integrated nowadays in reality"*. *"Life's always been 'more integrated', it's just more in your face nowadays"* the pracademic replies. The student continues *"I wouldn't disagree, but I think society creates more dissonance; we crave more efficiency but do so by adding more complexity, we try to evolve whilst trying to remain static; we're sort of stuck. Thinking more cybernetically with the 'black boxes' in Fig. 6.10 we can simplify them; learners 'black box' and its environment (all other 'black boxes'), it's just one system; which mutates as we change. Rid (2016, p.57) refers to Ashby to highlight the proximity of the interface between us and our environment which resonates"*:

> *"He tried to outline how a body and it's environment related to each other: was water, for instance, part of an organism or part of the environment."*

"Learning is like water: it's not what we learn, it's how we learn that helps us to maintain equilibrium; a mechanism to control how we change at different times" the student suggests.

"So, the HNC common skills framework is like water then?" the tradesman asks. *"You could say that. It's a system that interacts with and changes both learners and their environment; so, let's squash some of the boxes (Fig. 6.10, p.177)"* suggests the academic.

The academic continues: first let's acknowledge that T-Levels are here, apprenticeships are just *'lipstick-on-a-pig'* products in reality, but there's a willingness to rejuvenate technical education. Let's imagine we have a student coming from A-levels into higher education, with no idea about built environment disciplines; I'll start with the government/ regulatory *'black box'* (Fig. 6.10, p.177). Fig. 6.11 brings together extracts from the QAA (2014) UK Quality Code for Higher Education, the Level 6 bachelor's degrees with honours descriptor and the Scottish Level 10 equivalent; look at the language difference, **discipline** and **subject** are two different things; we push professional ideologies from the get-go.

Descriptor for higher education qualification at level 6 on the FHEQ: bachelors degree with honours	Descriptor for a higher education qualification at SCQF level 10 on the FQHEIS: bachelors degree with honours in Scotland
Bachelor's degrees with honours are awarded to students who have demonstrated: • a systematic understanding of key aspects of their field of study, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of a **discipline.** • an ability to deploy accurately established techniques of analysis and enquiry within a **discipline.** • conceptual understanding that enables the student: - to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a **discipline.** - to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the **discipline.** • an appreciation of the uncertainty, ambiguity and limits of knowledge • the ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the **discipline**).	Honours degrees are awarded to students who have demonstrated: • A systematic, extensive and comparative knowledge and understanding of the **subject(s)** as a whole and its links to related **subject(s)**. A detailed knowledge of a few specialisms and developments, some of which are at, or informed by, the forefront of the **subject**. • **A critical understanding of the established theories, principles and concepts, and of a number of advanced and emerging issues at the forefront of the subject(s).** • A critical understanding of the uncertainty and limits of knowledge and how it is developed, and an ability to deploy established techniques of analysis and enquiry within the **subject**. • A comprehensive knowledge and familiarity with essential and advanced materials, techniques and skills including some at the forefront of the **subject**. • Skills in identifying information needs, and in the systematic gathering, analysis and interpretation of ideas, concepts and qualitative and quantitative data and information from a range of evaluated sources including current research, scholarly, and/or professional literature.
Typically, holders of the qualification will be able to: • apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects • critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem • communicate information, ideas, problems and solutions to both specialist and non-specialist audiences. **And holders will have:** • the qualities and transferable skills necessary for employment requiring: - the exercise of initiative and personal responsibility - decision-making in complex and unpredictable contexts - the learning ability needed to undertake appropriate further training of a professional or equivalent nature. **Graduate Attributes/ Characteristics**	**Typically, holders of the honours degree will be able to:** • use their knowledge, understanding and skills in the systematic and critical assessment of a wide range of concepts, ideas, and data (that may be incomplete), and in both identifying and analysing complex problems and issues; demonstrating some originality and creativity in formulating, evaluating and applying evidence-based solutions and arguments; • communicate the results of their study and other work accurately and reliably using the full repertoire of the principal concepts and constructs of the subject(s); • systematically identify and address their own learning needs both in current and in new areas, making use of research, development and professional materials as appropriate, including those related to the forefront of developments; • apply their subject-related and transferable skills in contexts of a professional or equivalent nature where there is a requirement for: - the exercise of personal responsibility and initiative - decision-making in complex and unpredictable contexts - the ability to undertake further developments of a professional or equivalent nature.

Figure 6.11 – Comparing bachelor's degrees with honours criteria from the QAA (2014) Quality Code for Higher Education. (Adapted by author)

If we consider the first Montessori quote you (pracademic) provided on p.176, we can see at a regulatory quality benchmark level the UK example in Fig. 6.11 (p.178) is representative of what she saw as an issue; the Scottish equivalent possibly better represents what higher education should be. This is further supported by the 2nd underlined point in Fig. 6.11 (p.178) it makes reference to a *'critical understanding of the established theories'*; we've identified a lack of explicit conversation about theory in built environment education in this research, basically, it's not in the general UK criteria (Fig. 6.11, p.178). *"So, depending on what degree experience I want, it's a matter of geography then?"* suggests the student. It's a bit of a lottery at institutional/ course level I would suggest, which is where the complexity builds, and the QAA criteria possibly get lost in the ether in reality.

Thinking about Fig. 6.11 (p.178) and your (student) point, it raises an interesting question not so much about geography but about student type; full and part-time students bring different needs, from a range of different environments for which the degree experience does need to better cater for. We could suggest at a regulatory level that the QAA Quality Code better fuses together elements of Fig. 6.11 (p.178), and then qualifies to institutions that they better assess students to determine the direction of their degrees; whether it's a *'disciplinary'* or *'subject'* focus that would help students best get the qualification. The pracademic ponders for a moment: *"it touches on where I was going but yes, I would suggest that makes good sense, I'll use architecture for an example; does the student want to study to become an architect or architecture, which are two very different things and mean you can meet the QAA Level 6 descriptor in different ways"*.

On p.173 you (pracademic) outline RIBA's GC's and GA's, asking the question: *'how many assessment points do you need to realise them?'* It's applicable also with Fig. 6.11 (p.178). I use the RIBA criteria as an example solely because they're the only professional body with identifiable GA's; it aids further comparisons with Fig. 6.11 (p.178) which highlights the graduate attributes/ characteristics that degree holders should have. Re-visiting Fig. 3.7 (p.60) and the analysis of built environment courses, I now question not just the impact of all the assessments but how much size and weight disciplinary requirements add; effectively two qualifications are being studied. From this it leaves me questioning all the *'black boxes'* in between the learner and the government/ regulatory bodies in Fig. 6.11 (p.178), there's many *'dots that don't connect'*. This is another reason why the quotes of Montessori (p.176) resonate, in her questioning of the *'character of the university'*. *"Interesting, I hadn't really appreciated QAA descriptors at undergraduate level; although I question 'discipline' in the QAA criteria at doctoral level, it could simplify assessment significantly so that we can better evaluate learner's needs. We can go through all the other 'black boxes' but I think we have enough for now"* suggests the pracademic.

Picking up on the comments of the pracademic, the academic continues; actually *'need'* is a good word. Fig. 6.12 draws on Knowles et al (2015, p.158), who highlight the importance of *'need'* in the first phase of the process to help adult learners take control of their learning. The academic thinking aloud says, *"are these the 'four planes' we're seeking that brings us back to thinking of Montessori in adult education?"*. *"Like Ajax's TIPS model I highlighted?"* suggests the tradesman. *"Yeah possibly"* replies the pracademic deep in thought. I would suggest Fig. 6.12 has the right characteristics', but possibly still requires some fine-tuning says the academic. *"Yes, you're possibly right"* replies the pracademic.
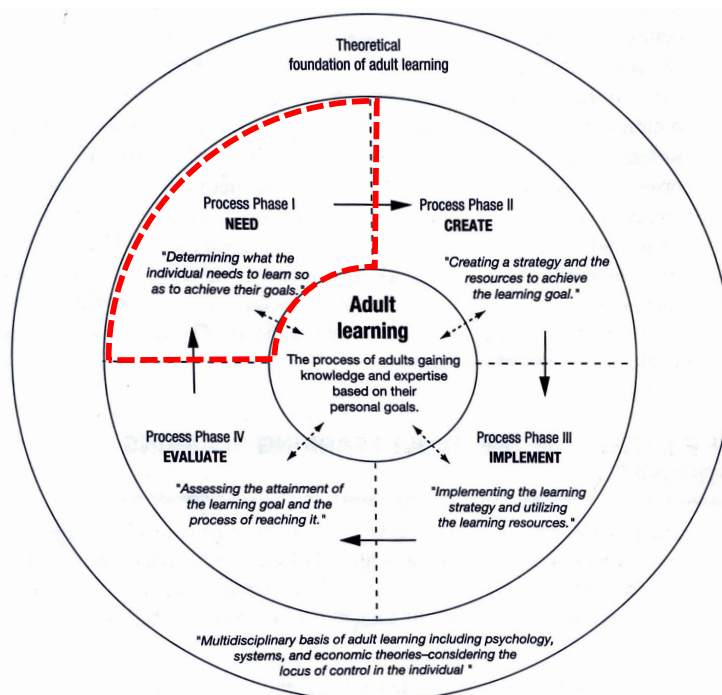

Figure 6.12 – Highlighting the need for adult learners to control their own learning process. (modified by author from Knowles et al 2015, p.158).

The academic continues; reflecting on both my degree experiences, my *'needs'* were never truly evaluated to direct my learning before it began. My first degree, I struggled, became de-motivated and dropped out with an HND. With my 2nd degree, I was a mature advanced entry student, I got a 1st class honours but do question how much I learnt; on reflection I felt things I learnt most weren't necessarily what I was assessed on. *"I know what you mean, I definitely felt more academically educated than professionally trained with my degree; I graduated thinking was it a success really?"* says the student. *"So, a lack of constructive alignment you would suggest is an issue" asks* the pracademic. The academic reflects for a moment: with the benefit of studying at doctoral level, comparing that programme to my degree, I'd have to say yes. *"We're back to your idea of 'output theory': potentially we need to more explicitly align learners to regulatory or professional body outputs in the instruction; and then we should develop the learning outcomes with learners, not just prescribe them in a curriculum"* says the pracademic thanking the academic.

The pracademic takes another sip of water and looks at his notes. I've come to appreciate *'constructive alignment'*, it's repeatedly popped up in this investigation. I'll refer to Biggs and Tang (2011, p.99) because they highlight something that's an issue in my experience and reflects what I've heard from both of you (student and academic).

> *"Where assessment is not aligned to the intended or other desired outcomes, or where the teaching methods do not directly encourage the appropriate learning activities, students can easily 'escape' by engaging in inappropriate learning activities, which become a surface approach to learning".*

This is a problem with built environment education, which I've deliberately only scraped the surface of with you in this research. Despite having data (module guides, coursework etc.) available, it's inappropriate to share and scrutinise it with you. But it's an area we start to see built environment education become *'misaligned'*. Many professional bodies do not have clear graduate attributes, for those that do, it's left to the interpretation of individuals and courses to determine their inclusion, who can undervalue the instructional value they offer, both in evaluating learners and programmes themselves. Thanks to you (academic) highlighting the L6 QAA descriptors (Fig. 6.11, p.178), we see characteristics, a framework for *'conversation'* to develop with the learners themselves and that's all we need.

Built environment education is largely outcomes-led education, in which *"learning outcomes are specified during course design, are communicated to students and are assessed and graded after instruction"* (Harland, 2012, p.59); for which a student turns up, provides some data and then we assess our instruction. Imagine this: as a learner, what if I find something more interesting to study; how can adjustments be made in the learning outcomes whilst in the learning process? Which meets the academic requirements set out by the QAA in Fig. 6.11 (p.178) in order to achieve an honours degree? *"But how would you ensure you meet the professional body requirements?"* asks the academic. You've answered my question by asking your own, you're default position wasn't the learner; we still need a shift in mindset. Professional body requirements distract delivery of a true *'higher'* education; they add size and weight to the learning experience and assessment of it. But with this are the needs of built environment professions best served by higher education; do the outcomes of one industry align with another? Reflecting on my experiences of built environment education, listening to you guys I would suggest they do not; it's evident this could be simply resolved by designing with learners and not for them.

I think we've gone as far as we can go, I'm going to take some time to reflect for a moment. You've all been really helpful, offered some great insights, I feel like I'm at a new beginning with this research, not necessarily approaching the end; lots of things to explore. So, I would like to thank you all for being involved, it's been a great help.

● Chapter reflections and insights

This chapter has unearthed more insights by chronologically exploring my development over a significant period of time, developing upon chapters 3 and 5 to explore issues with assessment that possibly stems from my school education. Reflecting on this chapter the keyword that sticks out is transition, that prior knowledge needs better assessment at the beginning of a new period of learning; to inform learning outcomes. From this, environment also matters with built environment education, because of student type and their different needs. Assessment needs to be optimised for the dominant learning environment, it needs to contextualise associated theories with practice to aid motivation; courses need to be more flexible in how learning outcomes are met to ensure alignment, between learner and programme through mixed-participatory ways.

I have shied away from university *'graduate attributes/ outcomes'* and this for two reasons; first for ethical reasons outlined on p.176; secondly by providing examples I would fall into the trap many institutions make, evident across their websites and literature. However, I do believe in the principle of graduate attributes, of using it as a *'conversation'*; one to develop with learners, evidencing where they have been realised within a coherent framework. One that is given sufficient space in programmes, that is present at induction and there at the end of it as a stepping stone to continuing personal and professional development. There is little merit in the generic statements that universities offer, in those where certain skills, attributes and behaviours are outlined; it reifies them, suggests others possibly are not of equal value. But there is merit in those attributes or characteristics regulatory/ professional bodies provide, they are the *'artefacts of output'* that can help align learners and educators progressing through disciplinary programmes to evaluate both; to better evidence skills and benchmark success.

An artefact like the HNC common skills framework is missing at undergraduate level, but it is needed in my view; it takes generic statements and allows itself to be moulded to an individual's needs. It can transfer the knowledge of others; it can evidence realisation of skills, attributes and characteristics; it can support the *'craft judgements'* of educators and also help develop learners as their thinking evolves, in a way that reflects models like those developed at Ajax where individual creativity flourishes within a community culture. It is from exploring Ajax's TIPS model and considering some reflection points in chapter 5, in which I highlighted pedagogy and personalisation as two *'nuggets'*, I would like to add two more now performance and process; performance considers assessment which with process is continual, not as most modules or units do and have submissions largely at the end of them. I will re-visit this towards the end of this point of reflection, as I provide an experiential model that reflects my journey in this research.

In pursuing satisfactory and not chasing optimal outcomes, this research as Simon (1996, p.120) outlines on p.174, has gone as far as it can to outline an issue with assessment; inclusion of artefacts within my own '*higher*' built environment education I felt was a step too far ethically, which hinders exploring it further. But beyond assessment within a period of study, it is the assessment or judgements that can be made prior which can impact most; here Biggs and Tang's (2011) *'Robert and Susan'* example resonates, I could be viewed as a *'Robert'* someone who Biggs and Tang (2011, p.5) suggest":

> *"is at university not out of a driving curiosity about a subject, or a burning ambition to excel in a particular profession, but to obtain a qualification for decent job".*

The real insight I offer is, having failed in my first attempt at doing a degree, I came back at 39 years old to prove something to myself; I had to study a disciplinary degree because that is how they are presented, but I had the aspiration to be and learn more. I may not be a bright *'academically speaking Susan'* as Biggs and Tang (2011) may put it, but I would suggest that I reflect an ever-increasing student population that learn as I do. Despite being an experienced *'Robert'*, I was not *'unmotivated'* like others are perceived to be, which is unhelpful as Biggs and Tang rightly highlight; I came with pre-conceptions of industry and found the modular nature of my course impinged my learning, because it is alien to real-life where learning outcomes change daily.

As a pracademic I have seen *'both sides now'*, whether a *'Robert or a Susan'* is irrelevant; we label learners, make assumptions and judgements; we *'dumb down'* content without really questioning the design of learning experiences and how we assess learners. Without assessing a learner's prior knowledge before a period of study how do we as educators and institutions really know what their learning needs are? As institutions we are questioned by society, government, professions and learners, mainly because we do not have a rigorous enough *'conversation'* with learners at the beginning, because we are too busy designing experiences from our perspective and how we learnt. From the quotes of Montessori (p.176) I question *'the character of the university'*, whether it is the right place for disciplinary built environment education; I believe *'higher'* should mean more.

Learning and working environments need to be a more seamless experience to aid lifelong learning, and not just for those taking an unorthodox journey like myself; educational models need to offer greater flexibility and more clarity in assessment. Exemplars such as Ajax's TIPS model, but more so my HNC common skills framework and Vitae's (2020) Researcher Development Framework (RDF), briefly outlined in chapter 5, are part of a curriculum that put's adult learners in control of their learning. It is through the theories of both Montessori and Knowles I have explored my built environment education, particularly over chapters 5 and 6 which I want to now bring together moving into chapter 7.

With Montessori I have sought to re-imagine the age-bound *'planes'* outlined in Fig. 4.15 (p.114), I do so now within Fig. 6.13 with the *'4P's'*. In concluding chapter 5 I outlined personalisation and pedagogy as two *'nuggets'*; I add two more from this chapter, process and performance. Both of them are what stand out for me with my HNC and in observing the Ajax model in action, that the process aids the transition through different stages; performance brings a feedback conclusion that feedforwards. I will re-visit Fig. 6.13 again in chapter 8.

The core principles of andragogy (Fig. 4.22, p.122) sit centrally within Fig. 6.13; *'when, who and where'* are additions to *'why, what and how'*. Fig. 6.13 is orientated so that performance and pedagogy sit both above and below the x-axis, to reflect *'conversations'* from Fig. 4.20 (p.120); to conceptually address any perceived conceptual limitations of positivism. Fig. 6.13 is scalable and includes various forms of knowledge; it reflects the antidisciplinary stance I have taken in this research. However, Fig. 6.13 possibly requires more context for built environment education specifically, I will reflect on this and will look to develop the threads a little further going into chapters 7 and 8.
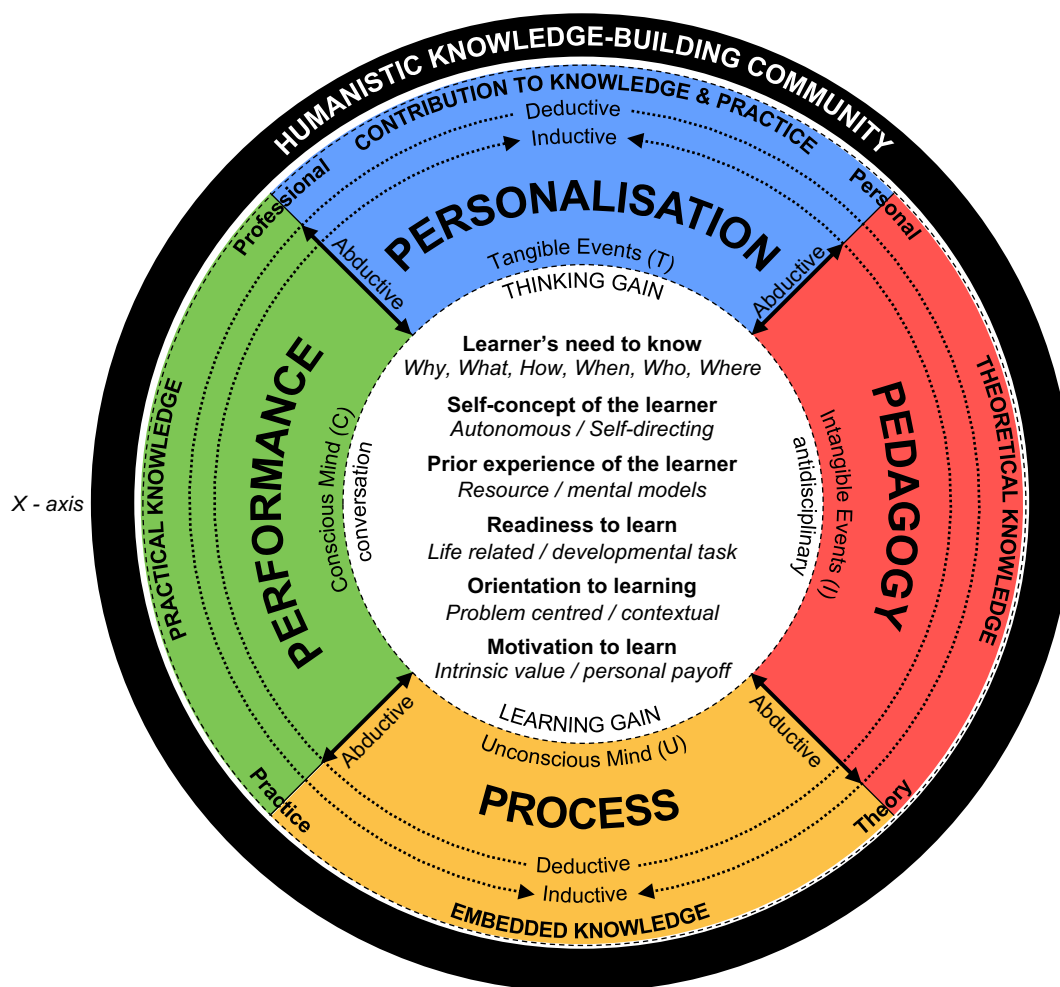

Figure 6.13 – The 4P model which conceptualises ideas from this research (By author, Andragogical 'core principles' from Knowles et al, 2015, p.6).

Chapter 7 – Concluding this Investigation

In the spirit of this research, this chapter concludes in an equally reflective tone. The research aim is re-visited to outline how it has been realised, outlining how the research question has been answered through the research objectives (RO's); which are aligned with the QAA criteria (Fig. 2.15, p.45). As outlined throughout this thesis RO's 1-3 focus on my contribution to knowledge, RO4 my contribution to practice; RO's 1-3 provide the focus within this chapter, RO4 is discussed but more so in chapter 8 as recommendations to re-imagine built environment education.

Realising the research aim

The research aim in this investigation was:

> ***To mobilise my own vocational, academic and professional experiences of built environment education, provide meaningful personal insights to benefit a range of stakeholders influencing current practices, and to inform recommendations for re-imagining the built environment learning experience.***

This has been realised, both through the literature explored and my personal experiences. A number of personal insights benefit a range of stakeholders influencing current practices within built environment education, these insights have been creatively and imaginatively explored in my use of autoethnography. Although drawn from personal experience, these insights represent my contribution to knowledge and inform recommendations that make my contribution to professional practice in chapter 8. The research question and how it has been answered through the research objectives breaks down how the research aim has been realised further.

Answering the research question

The research question in response to the aim had to explore why I believe built environment education needs to be reimagined; the research question was:

> ***Why do my own experiences of built environment education drive the belief it needs to be re-imagined, and how can my experience provide insights to inform current practices?***

From multiple perspectives of *'self'*, I have outlined how a range of stakeholders influence current practice and impacted my built environment education over a significant amount of time. My use of autoethnography has been orientated to be more than just a reflexive *'tool'*, supporting the belief that built environment education can be re-imagined, not wholesale change, just a tweak in current practices. To answer the research question more fully I do so through the research objectives because it is through them that I challenged my belief re-imagination is required. They better outline how my contribution to knowledge and professional practice presents itself.

How the research objectives help address the research question

Four research objectives aid the realisation of my aim and research question, they have helped to orientate me and been systematised explicitly within my thesis; they have provided a useful stepping stone to now. However, as much as I value their contribution to this research I want to better support them and my use of autoethnography moving through this chapter.

From chapter 2, I have *'constructively aligned'* my research objectives with the QAA (2014) criteria outlined within Fig. 2.15 (p.45), to articulate how my contribution to knowledge and practice is realised, in doing so it draws on the principle of what Hughes and Pennington (2017) and Hughes et al (2012, p.216) offer to evaluate autoethnography. The reality is that there is a lot of crossover within the *'conversations'* with my research objectives; therefore, I feel they would lack the clarity to help evaluate autoethnography sufficiently. It would lead to a very repetitious chapter, which at this stage of the research as I look to consider chapter 8 and any recommendations is not helpful; the QAA criteria I feel offers this clarity starting with Fig. 7.1.
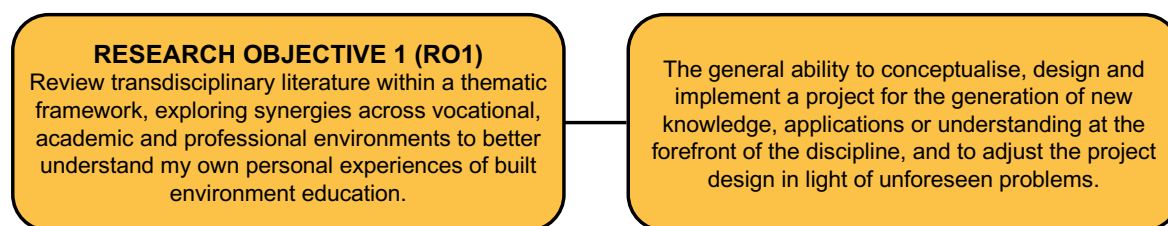
RESEARCH OBJECTIVE 1 (RO1)
Review transdisciplinary literature within a thematic framework, exploring synergies across vocational, academic and professional environments to better understand my own personal experiences of built environment education.

The general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in light of unforeseen problems.

Figure 7.1 – Conceptualising, designing and implementing this project (By author).

Chapters 1 helps to conceptualise this research, briefly introducing myself and a snapshot of my doctoral journey, it breaks down the thesis title, outlines autoethnography itself; what is not included in my breakdown is why *'built environment'* education. I wanted to be inclusive of all disciplines, thought disciplinary references would limit this research, I needed to go beyond my typical disciplinary boundaries; my insights benefit by not being limited by them. The seeds of need outline a perceived gap in knowledge relating to graduate attributes, a central *'conversation'* within this research from chapter 3, primarily as *'output theory'* to help me postulate through autoethnography.

My research aim itself is helpful, but my research question is more useful; it is a double-barrelled question; *'why'* is more divergent and open-ended, *'how'* is more convergent by design. Together they orientate me towards achieving my goals, whilst providing insights into a problem, I will outline how. Finally, in chapter 1 the characters are introduced, doing this early brings an awareness to the reader they are actively present immediately; integral to helping me conceptualise my research objectives through autoethnography.

Chapter 2 includes my *'autoethnographic cloud'* (Fig. 2.8, p.32), data sources floating in the ether. Chapter 3 informs my understanding of *'why'* going into chapter 4, Fig. 4.2 (p.91) conceptualises my position before exploring the literature to determine *'how'* best to approach chapters 5 and 6. Fig. 7.2 brings this journey to its conceptual conclusion, my data is not in a *'cloud'* it has been assessed creatively through autoethnography; the *'4P's'* from Fig. 6.13 (p.184), they reflect my thinking from doing this research.

Chapter 2 outlines strategies to help the story to emerge, but it does not rest on its laurels, it explores other fields like design science to outline synergies with autoethnography. From chapter 4 a better understanding of artefacts, of educational theory and the limitations of established experiential models is known from analysing them; theory informs practice going into chapter 5 (Fig. 7.2). Cybernetics, synergetics and design science underpin my use of autoethnography; fusing these fields together showcases what autoethnography can offer to practitioner research, extending knowledge of it and other fields methodologically.
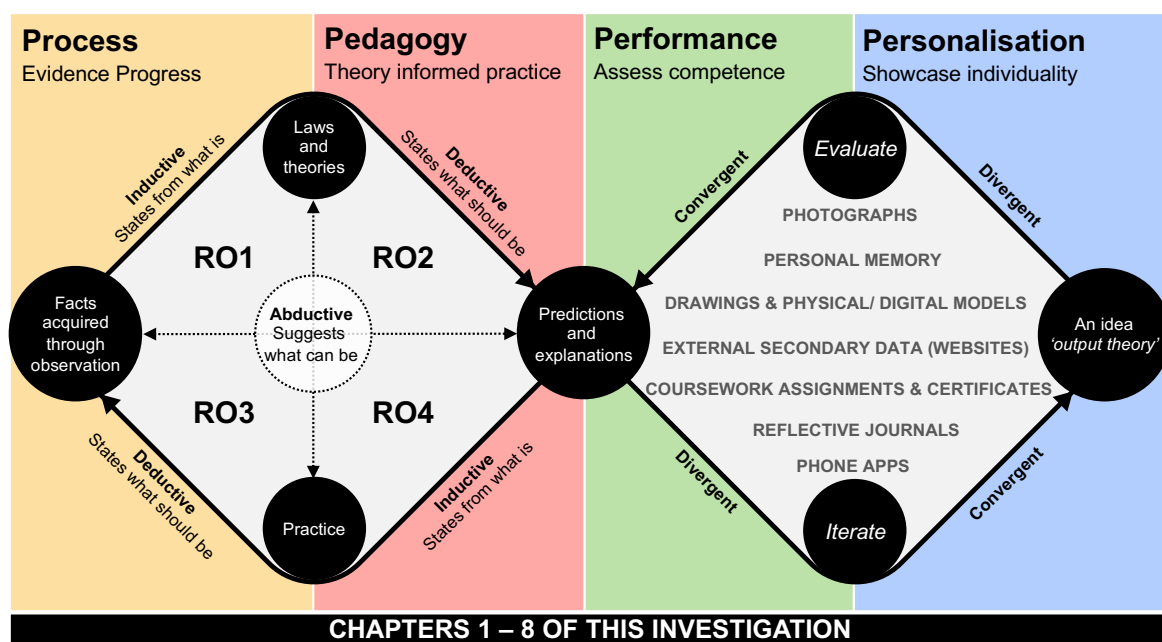

Figure 7.2 – The iterative story from Fig. 2.8 (p.32) and Fig. 4.2 (p.91) to include the '4P's' from Fig. 6.13 (p.184) to conceptually conclude this investigation. (Adapted by author, model from Design Council, 2017; informed by Dresch et al 2015, p.62; Chalmers, 2013, p.50).

By inductively exploring my vocational, academic and professional experiences of built environment education in chapter 3, a greater insight into *'why'* is actually informing *'how'*. By taking a conceptualist approach through autoethnography I am creating new knowledge through my insights, whilst in the process of figuring out *'how'* to structure *'conversations'* later in chapters 5 and 6. Fig. 4.24 (p.126) captures the point where my focus moves more so from *'how'* to *'why'* with my research question, this is a significant point of transition going into the second half of this research.

Informed by the thematic framework from chapter 3, chapter 4 explores literature to develop my understanding of *'how'* to analyse artefacts through design science; of conceptualising cybernetically with my *'black box'*; of exploring humanist theories leading to Montessori and Knowles; to critiquing experiential models I have experienced. They all inform *'why'* going into chapters 5 and 6; why do I have the belief re-imagination is necessary?

Chapters 5 and 6 use a simplified framework (Fig. 4.24, p.126) which supports my use of autoethnography, helping me focus on the characters; on how to structure the content in order to showcase the story my experiences offer. The visual elements of this thesis help me to explicitly demonstrate my understanding and thinking at different times, the merits of this continue going into chapter 8 with my recommendations.

Chapters 3, 5 and 6 progressively help unlock many insights through autoethnography, explicitly used or not, my use of characters have significantly helped to conceptualise and design this research; been a valuable tool in my *'toolbox'*. With autoethnography they have brought a different dimension to this research, really challenged my thinking; stretched me to re-imagine *'self'* and demonstrate my learning gain to you, they have been pivotal to the success of this project in my view.

RESEARCH OBJECTIVE 2 (RO2)
Identify through autoethnography how my own actions, beliefs and convictions impact my practices, exploring how my own pre-conceptions have developed as a result of my vocational, academic and professional experiences of built environment education.

A detailed understanding of applicable techniques for research and advanced academic enquiry.
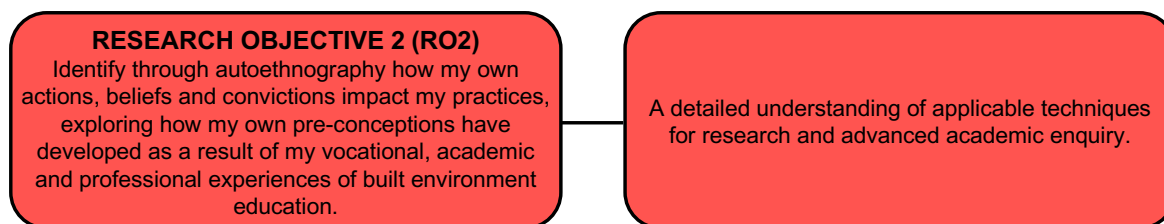
Figure 7.3 – Outlining applicable techniques through autoethnography in this project (By author).

Chapter 1 outlines autoethnography, but chapter 2 provides a deeper exploration into the method; a priority in chapter 2 was to establish my own position and how I intend to use autoethnography. I felt it was more useful to communicate this earlier, rather than go straight into philosophical positions, strategies, and methods. By doing this I found it offered me a better understanding of how to develop my research, of how to write autoethnographically; it allowed me to take stock of the skills I had and needed to develop.

Positioning of chapters has been a constant challenge; the first two chapters can feel like it takes some time to get to the story itself. However, by rigorously exploring autoethnography methodologically; exploring other fields like design science; outlining types of data I have; the ethical implications of doing this research; whilst exploring concerns about evaluating the method, from chapter 3 onwards I felt I could better focus on applying the techniques in practice (Fig. 7.3).

188

This thesis is one *'conceptualist autoethnographic conversation'*, utilising an array of *'tools'*; chapters 3 and 6 simulate multiple perspectives of *'self'*; chapter 5 offers more explicit *'conversation'* between me and a range of different data types, benefitting from the review of literature from chapter 4. The idea for role-play simulation through characters came from design science, showing the flexibility autoethnography offers. In reflexively challenging my *'lived experience'* to *'create and interpret new knowledge',* simulating it in this way has helped to develop my thinking. Immersing myself within the culture of built environment education, observing others to help reflect on my practice, has ethically challenged me. As both *'observed and observer'*, it has magnified how my own pre-conceptions can and have developed over my career; for which autoethnography has helped to guide my practice as the story has unfolded.

The inductive analysis of chapter 3 (Fig. 3.30, p.88) helped focus the review of literature in chapter 4; but more so it showcases the strategies outlined in chapter 2 (Fig. 2.7, p.31), which let this research evolve. From this, chapter 4 helped to operationalise my use of autoethnography by better appreciating how to study artefacts, exploring humanist learning theories and analysing experiential learning models. Appreciating the work of Montessori and Knowles significantly informed chapters 5 and 6, which I will come back to discussing Fig. 7.4. By going beyond my disciplinary boundaries to explore other fields like cybernetics, synergetics and design science my knowledge and understanding of artefacts has grown, particularly the embedded knowledge within them; evident in my critique of established experiential learning models, which leads me to question how others really understand them when applying them in practice.
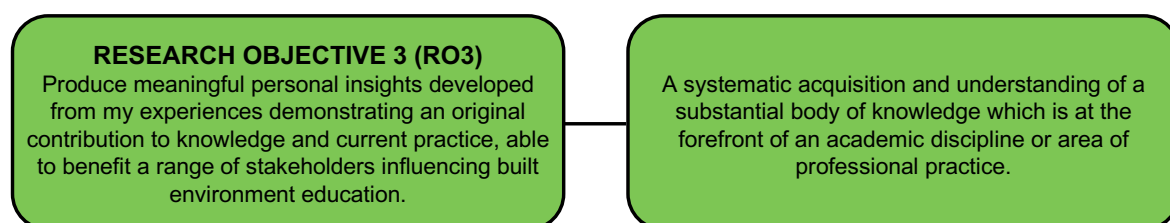

| RESEARCH OBJECTIVE 3 (RO3)
Produce meaningful personal insights developed from my experiences demonstrating an original contribution to knowledge and current practice, able to benefit a range of stakeholders influencing built environment education. | A systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice. |

Figure 7.4 – Producing insights that make a meaningful contribution (By author).

In respect to Fig. 7.4, this research offers many personal insights: chapter 2 outlines me figuring out how to orientate my use of autoethnography, that methodologically its alignment with design science offers a viewpoint of built environment education not explored before; to my knowledge an original contribution that extends both fields. My analysis of comparable courses in Fig. 3.7 (p.60) raises questions of how courses can adequately benchmark quality against sector-wide metrics; of how such significant variations in assessments impact the user experience for both staff students and staff, of how graduates are of comparable quality in assessment of their competence.

From the analysis of comparable courses (Fig. 3.7, p.60), came questions of efficiency but led to further questions on what is being assessed. In my view it is evident stakeholders collectively do not appreciate the impact of artefacts they design and use, of embedded knowledge within them and how it transmits. Reflecting on my own experiences, potentially the wrong artefacts are being assessed by design; that modules with learning outcomes are assessing the quality of programmes, not measuring the true learning gain or ability of learners. To which I question what has been assessed in my own education, course learning outcomes or my actual ability; as a result, it has led me to question my ability and how competent I am as a learner.

From appreciating different types of knowledge, it has been in highlighting *'folk knowledge'*; pedagogies that reflect practice, but which can produce counter-productive behaviours to how students actually learn, further insights are offered. Staff coming to academia from practice can rely too much on tacit knowledge and instinct, which can impact negatively on student learning. The immediacy of my student and staff experiences has magnified this as an issue, bringing a greater appreciation of the impact myself and others can have. Being immersed within the culture of built environment education for a significant period both as a student and a pracademic, this is an area to address, particularly with well-known issues around silos and fragmentation. This can lead to undervaluing the process of learning in my view, pre-professional ideologies and disciplinary requirements of courses can channel the mindsets of learners. I have a greater appreciation of having explicit conversations on associated learning theories, adult students do require learning programmes orientated more andragogically potentially; a wider appreciation also of what a *'curriculum'* can be has informed my use of innovative pedagogies like *'lifelogging'*, which could better synthesize learning practices that span different environments.

Chapters 3, 5 and 6 offer further insights in critique of textual artefacts: regulatory bodies provide benchmark statements and qualification descriptors; benchmarks statements summarised in Fig. 3.22 (p.78) offers areas to consider for re-imagination at a regulatory level in chapter 8. Qualification descriptors are discussed in chapter 6, Fig. 6.11 (p.178) raises questions of language (subject/ discipline) within them and of their impact at course level; however, they do offer the attributes and characteristics holders of the qualification should have, something to re-visit in my recommendations. Within chapter 3, information that professional bodies use to validate courses academic institutions and educational providers offer is inconsistent, the industry council representing them seems largely ineffective. But from the criteria of six professional bodies, there are some core subjects to also consider in chapter 8: the RIBA offers graduate attributes (Fig. 3.19, p.74) which serve as a good precedent which I will come back to shortly.

In exploring my experiences, I do believe that re-imagination could benefit built environment education, in answering my research question I now have greater insight into *'why'*. My personal insights come from systematically working through experiences I have shared with others, from data created by myself and others, from observing others to reflect on how I impact. From this perspective it is difficult to see why autoethnography is criticised for being so self-indulgent, narcissistic, or solipsistic; it requires so much consideration being given to others. As a method it has helped to creatively re-imagine my *'lived experience'*, worked with the data of others; helped me to creatively explore topics, to provide pragmatic insights that benefit a range of stakeholders.
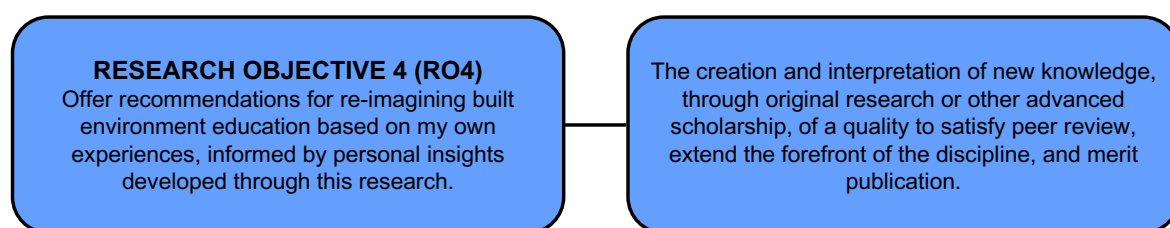
RESEARCH OBJECTIVE 4 (RO4)
Offer recommendations for re-imagining built environment education based on my own experiences, informed by personal insights developed through this research.

The creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication.

Figure 7.5 – Valuing the 'output' to make my contribution to knowledge and practice (By author).

This research creates and interprets new knowledge in a very imaginative way, not wanting to overstate my claims to originality, it does so through providing an authentic account of my *'lived experience'*; of *'my individual professional practice'* (QAA, 2014), integral to the success of my professional doctorate. Fig. 7.1 (p.186), Fig. 7.3 (p.188) and Fig. 7.4 (p.189) with how I have achieved them go some way to realising Fig. 7.5, to outlining my knowledge and professional practice; however, I still need to go into chapter 8 to fully realise it and its associated research objective (RO4). I will better articulate my contribution to knowledge and professional practice in a moment, but first it is important to acknowledge the role RO4 (Fig. 7.5) has played in this research.

Graduate attributes represents where I see a gap in knowledge, based on how it is valued and used by various stakeholders currently. RO4 (Fig. 7.5) has helped to orientate me to achieve my *'goals'*, directing the other RO's; RO4 is an aspirational *'artefact of output'*, a continual *'conversation'* that I have both written about and represented graphically. I have compared graduate attributes with *'demonstrating doctorateness'* (Trafford and Leshem, 2008), described it as *'output theory'* to postulate about theory through autoethnography. This is because by design, many stakeholders within built environment education do not value the *'output'* enough at the beginning. In my view this is reflected in the different textual artefacts I have explored, within the design of learning programmes themselves; evident in how we assess learners. In making my own contribution to knowledge, I have shown what the impact of this is from a personal perspective which also informs my contribution to professional practice.

Contribution to knowledge and professional practice

My knowledge contribution may be privileged, contested and situated, but it comes from a uniquely placed individual. As a student I have paid the increased fees, balanced work and full-time study. As a *'pracademic'* I have been immersed in the culture of both construction and education at many levels, over a significant period. As a researcher, I have used the skills and knowledge my experiences offer and creatively applied them; reflecting on them I have come to value the principle of graduate attributes, a *'tool'* to motivate and direct towards achieving a successful *'output'*.

At a regulatory body level, the QAA provides attributes/ characteristics at different levels of qualification; however, for built environment education the benchmark statements could be harmonised, drawing together ideas outlined in Fig. 3.22 (p.78). Professional bodies, albeit inconsistently, have exemplars; the RIBA offers a good example of graduate attributes (Fig. 3.19, p.74), these can simplify assessment, offer clarity in the instruction and bring a greater realisation of learning gain; however, they can be overlooked and undervalued as a *'tool'*. I question graduate attributes offered by academic institutions, in my view they distract and undermine the value of those applicable to qualifications. At doctoral level, I have used the QAA (2014) criteria explicitly (Fig. 2.15, p.45) to demonstrate how I have met them now. This is required at all levels of built environment education in my view, academic institutions should explicitly use regulatory and professional body criteria to simplify their regulations; to better inform learners and other stakeholders.

Through analysing comparable built environment courses, we possibly see where a lack of clarity can impact learning experiences directly. Fig. 3.7 (p.60) highlights the complexity of courses, variations in the number of modules and amount of assessment; bringing this into context the RIBA provides six graduate attributes for Part 1 (Fig. 3.19, p.74), how many times does a learner need to be assessed to demonstrate they qualify at that level? In my experience modules impinge on the process of learning, learning outcomes can be mimicked, I have done it evidently as I have outlined in chapter 5; they encourage a *'chase-the-grade'* culture, bunch assessment and can be inefficiently used.

Reflecting on my experiences I have arrived at the conclusion we are not actually measuring a learners ability, but testing the design of the assessment itself that staff have created. De-modularising the experience could help re-imagine built environment education, re-focus it to better realise learning gain and synthesize industry practice. Programmes currently can limit learners in my view, but as learners we are not always aware of what our needs are in the learning experience itself, for me this was most evident in how I have come to appreciate NVQ's over my City & Guilds qualification as an apprentice.

As a student at the time I saw NVQ's as an inferior product, but reflecting on this as an educator I now see that pedgogically they suited me and the principle of them possibly still does as a learner; that with better support the synergies with my learning in the workplace would be better realised. Better assessment of learners needs to happen at induction, learners themselves need to be more informed of their own responsibilites from the outset; an important area to consider for adult learners, and also for all transitions between different levels of built environment education and practice.

From apprenticeship, HNC and degree experiences to my doctoral journey, the relationship between educational theory and practice has been examined; in doing so I have explored different fields and disciplines to make my contribution to educational research. Exploring educational theory has been one of the most enlightening aspects of doing this research, it has led me to realising a lack of explicit conversation of underpinning theories for the main part; impacting my understanding and personal growth as a learner at different times.

Reflecting on this, I feel the disciplinary and modular nature of courses is a significant factor here, especially with my higher education; professional training dominates the academic education. Explicit conversations are required about underpinning theories and pedagogy, or *'andragogy'*; as adult learners we can lack awareness of our learning needs (Fig. 6.12, p.180), I feel it has impacted my personal development at times. The relationship between feedback/ feedforward is crucial here, a framework is needed to better support learner development; one that negates issues with modularisation, semesterisation and which aids better adoption of more innovative use of pedagogy.

My doctoral journey offers a precedent for what is possible, a curriculum bringing together a *'path I have followed and a path I intend to follow'*; freedom to re-imagine *'self'*. Reflecting on Fig. 3.18 (p.74) it could be suggested the core subjects of built environment education are embedded within it. Graduate attributes, central theme, connects academic and industry themes; my health and wellbeing part of the story in chapter 5; my professionalism is evident in my critique of others, ethics particularly has been considered continually to assess the impact to myself and others. I have, possibly too much at times, focused on the *'science of design'*, on the technology and environments that have impacted me as a learner at different times; in respect to sustainability I have creatively brought my past and present together, to now look to the future in this research. Exploring the *'science of my design'*, I have provided insights into how this research has been managed, that methodologies offered from both industry and academia through andragogy (Fig. 5.6. p.139) have helped me to do this; by exploring educational theory, I have also outlined what had been missing in my experiences at different times.

From Montessori and Knowles particularly in chapter 4, being able to then go on and explore them in the context of my own experience in chapters 5 and 6 has been invaluable; having not heard of andragogy prior to doctoral study, to then use it as a tool with autoethnography has helped to appreciate its value. From Montessori's focus on the learning environment, it has led to me seeing synergies in her theories, my joinery shop apprenticeship and doctoral programme; the latter more so, but this has come as a result of my doctoral journey itself. With both Montessori and Knowles with andragogy I see verticality: with Montessori this is best evidenced in my observations of the Ajax TIPS model with football, a precedent to consider with the different transitions built environment education offers between technical and higher levels; from andragogy is an appreciation of my transition through my HNC (Table 5.2, p.145).

I have come to appreciate through doing this research the value of my HNC common skills framework (Fig. 6.7, p.170), recognising similarities with Vitae's (2020) RDF and my own doctoral programme which has annual reviews to monitor performance. An equivalent is necessary at undergraduate level, it offers a means to re-imagine the spine of courses at that level; a *'tool'* to re-focus how and what we assess with learners, I stress *'with'* because in my view they need to have more input in what and how they learn. Developing such a framework could offer greater connection to industry, in the form of practices that relate to recording continuing professional development (CPD); it would make explicit a learner's true gain, it places responsibilities on evidencing personal performance and developing reflective practices. By providing a simplified framework like (Fig. 6.7, p.170) to promote independent inquiry, learners can develop with greater autonomy within supportive learning environments; with educators promoting the acquisition of skills, not just transmission of existing knowledge.

Lastly, to help conceptualise and focus my use of autoethnography in chapters 5 and 6, I critiqued an array of experiential models and other visual representations. Highlighting their limitations and the embedded knowledge they contain within them; I have challenged their value within my experiential reality. Concluding the visual side story in this research, Fig. 6.13 (p.184) outlines the story of my reflections as I meander through my experiences, one which lends itself as an instantiation (Fig. 4.13, p.105) for further research; a *'tool'* to develop that potentially benefits others in their own journey, which is informed by looking back to reflexively *'connect-the-dots'* of my experience and the previous work of others. The focus of this research may be on one individual and this could be perceived as limited, but it is in the exploration and critique of existing theories and experiential models Fig. 6.13 (p.184) is informed. I will re-visit this in chapter 8, as I seek to fully realise my contribution to knowledge and professional practice.

Chapter 8 – Recommendations for Re-imagination

To fully realise my aim, research question and 4th research objective, this chapter offers six recommendations that represents my contribution to professional practice; they are offered by stakeholder and areas they directly influence built environment education, to consider how they could improve current practices whilst outlining ideas for future research. The boundaries and limitations with my final reflections bring this research to its conclusion.

Recommendations for Government/ Regulatory Bodies

A recommendation for government/ regulatory bodies (QAA) influencing built environment education is:

1. **Review qualification descriptors** for built environment education. Fig. 6.11 (p.178) outlines differences in language (subject/ discipline) for UK and Scotland, these should be reviewed for their impact on learning experiences. A *'subject'* approach lends itself to academic qualifications (architecture for example); a *'discipline'* approach lends itself to a professional pathway (training to be an architect). Students may wish to study for a degree in a subject at a higher level, without necessarily wanting to study that profession; so, should be assessed accordingly. A *'subject'* approach through being an academic qualification, could simplify assessment of the learning experience offered at any level. A *'discipline'* approach should consider both qualification descriptors and benchmark statements at any level, programmes could separate professional training and academic education; there may be value in dual qualifications to do this. The simple solution would be to align all qualification descriptors to state *'subject'* at all levels, the Scottish example within Fig. 6.11 (p.178) in my view better emphasizes the qualities of scholarly practices; it offers more scope from the language it provides; lending itself to interpretation to suit individual learner needs as I have demonstrated explicitly in this research with the doctoral level equivalent.

Recommendations for Professional Bodies

Considering recommendation 1, two recommendations are offered to professional bodies influencing built environment education:

2. **Harmonising benchmark statements** for built environment professions to underpin the QAA qualification descriptors, the Construction Industry Council (CIC) should oversee this. Fig. 3.22 (p.78) outlines five benchmark statements with key observations from each. Although the RIBA offers graduate attributes in their validation criteria (Fig. 3.19, p.74), it is only Engineering that explicitly refers to and sets out the *'characteristics'* of graduates; a consideration here is common characteristics to reflect all disciplines.

The CIC (1998) does have *'Higher Education Graduate Common Learning Outcomes'*, (Fig. 3.21, p.77), these could be reviewed as part of this recommendation and aligned to better articulate common graduate attributes/ characteristics; its language could better reflect academic and professional themes for *'higher'* education, be more directional as an instantiated artefact and informative to lifelong learning development.

Benchmark statements and professional body criteria should be reviewed to determine core subjects: Land, Construction, Real Estate & Surveying (Fig. 3.22, p.78) does outline eight subject areas; Architectural Technology (Fig. 3.22, p.78) offers four main aspects, *'design, technology, management and practice'*. This in my view offers a more flexible framework to suit disciplinary needs in how further topics can be categorised within them, it also potentially lends itself to better adoption with academic stakeholders and to better realising them in learning experiences at different levels; Fig. 6.9 (p.175) has begun to explore this at a technical level with my HNC.

The Town and Country Planning benchmark statement (Fig. 3.22, p.78) offers suggested levels of attainment; *'threshold, typical and excellent'* offers a precedent for all disciplines to adopt in better benchmarking students and professionals at all levels. The merits of this could be extended to current academic classifications (1st class, 2:1, etc.), these could be replaced to better synergise assessment across academic and professional environments, the value of doing this requires further research; an initial observation here is that it may offer synergies with continuing professional development (CPD) needs, or potentially aid greater flexibility in academic and professional courses to suit individual learning needs and innovative pedagogical approaches.

3. **Professional Development Passports (PDP)** could be developed in conjunction with other regulatory body and academic stakeholders, to reflect academic and professional needs of lifelong learners; to aid a vertical transition through both technical and higher education, free of pre-professional ideologies, more focused on *'subject'* than *'discipline'*. Formulation of PDP's should be a simple instantiation to promote adoption, with space to evidence learner progress and evaluation of their performance; a physical or digital *'artefact'*. Assessment through *'threshold, typical and excellent'* grade indicators may be useful, this could better evidence learning gain at any given time; from beginning a period of study, during it and afterwards, reviewed annually if necessary, depending on learning environment. It could form the spine of built environment education learning programmes associated at any level, improve literacy on formative and summative feedback and help develop reflective practices; offer synergies with personal and continuing professional development (CPD); this is an area for further research to establish its merits.

196

Recommendations for Academic Institutions and Educational Providers

Developing from earlier recommendations, three are offered to academic institutions and educational providers influencing built environment education:

4. **Graduate Attributes from academic institutions** should be phased out and withdrawn, it is non-productive to provide generic attributes, embedded equivalents are only useful if explicitly applied; graduate attributes/ characteristics should be explicitly drawn from the qualification descriptors or benchmark statements of regulatory/ professional bodies, better realisation of learning gain is offered by aligning qualification criteria and learners, at any level; this could aid benchmarking and evaluation of programmes themselves.

5. **De-modularising the learning experience** could benefit built environment education and practice; in considering recommendation 3 a PDP style approach or a common skills framework could form a spine for an entire period of study; the HNC example offered in Fig. 6.7 (p.170) or Vitae's (2020) Researcher Development Framework (RDF) serve as a precedent applicable to any level of study. Until my doctoral journey all my learning experiences have been compartmentalised in some way, my professional doctorate has been a non-modular experience, my performance reviewed year-on-year; underpinned by supervisory support, formative feedback/ assessment and development training to record and monitor my progress; it has four enrolment dates throughout the year and has a rolling programme. Unlike other levels it has not been hindered by the impact of semesterisation, which can impinge on the learning experience and the development of learners in my experience.

   Compartmentalising learning in some form is necessary so as not to overwhelm students when learning new concepts and subjects; however, in my view based on my analysis of comparable courses (Fig. 3.7, p.60) and from *'conversations'* around it in chapters 3 and 6 (Fig. 6.8, p. 174), modularisation contributes to siloed and fragmented practices of both construction and education sectors. From this analysis in my view, it reflects poor design thinking at a course/ sector level currently, that programmes are not sufficiently designed with learners themselves in mind; it encourages poor use of pre and co-requisites, inferences through learning outcomes can lead to poor assessment of learner competence. Artefacts of such practices are potentially not measuring learners in reality; explicit *'conversations'* of underpinning theory can be overlooked. Re-imagining the use of modules could simplify course structures, better utilise staff experience; help to re-think a semesterised academic year with more rolling start dates; to re-consider what actually needs to be assessed, academic education or professional training at different levels. This recommendation offers significant scope for further research.

6. **Developing experiential models of adult education** could help vocational, academic and professional built environment education, from analysing other experiential models. Fig. 8.1 is an artefact of this research, a slight revision from Fig. 6.13 (p.184) it includes *'design, technology, management and practice'*, informed by recommendation 2; it offers a framework for core subjects to be categorised at QAA benchmark statement level.

Fig. 8.1 could inform the development of a method that reflects the principles of the process elements of andragogy outlined in Fig. 5.6 (p.139) and Table 5.2 (p.145), this is another area for future research; particularly to adapt it to built environment education at different levels. Andragogical core principles in Fig. 8.1 provide *'the source'*, the rest of Knowles et al (2015, p.6) model (Fig. 4.22, p.122) I have found of limited use in this research; the context it provides was not immediate enough for me personally. By re-imagining the context around them, it possibly addresses criticisms of andragogy itself (Hartree, 1984; Rachal, 2002) outlined in chapter 4; a potential contribution to practice and andragogy itself.
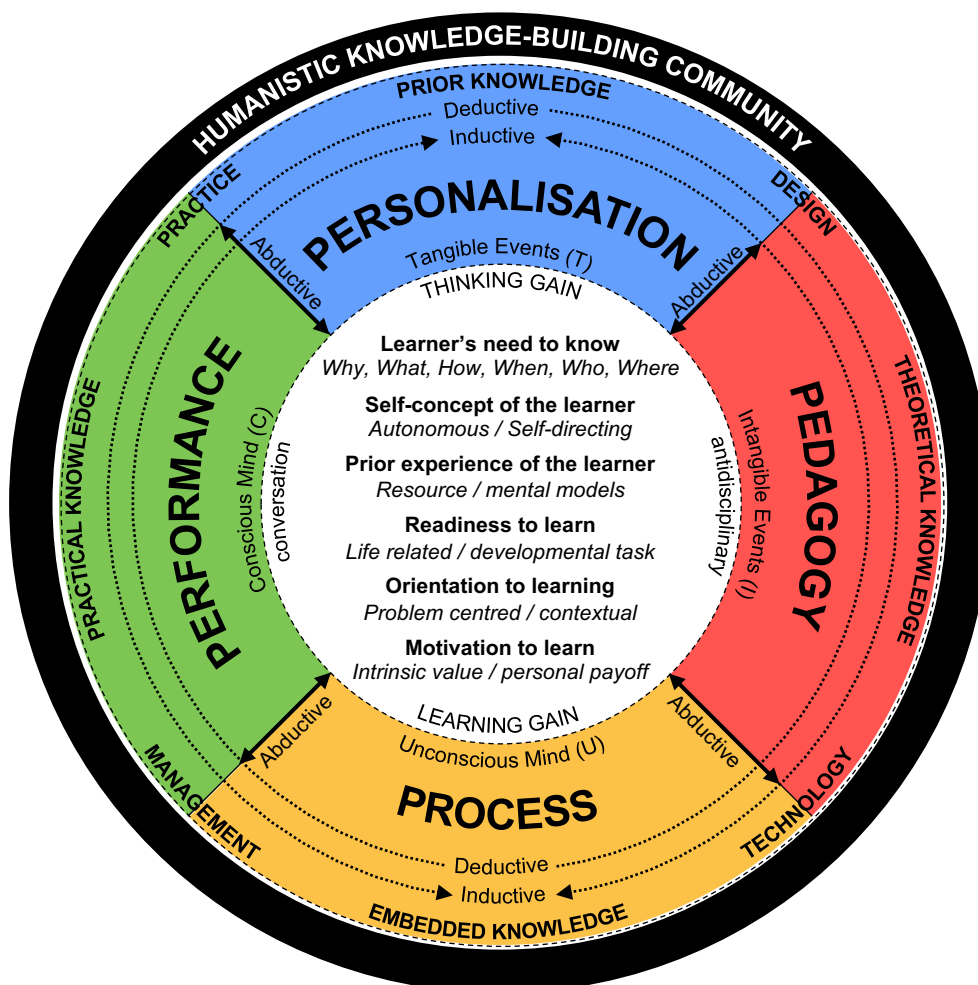

Figure 8.1 – Revision of Fig. 6.13 (p.184) to reflect the 'conversation' in recommendation 2 to include built environment education themes and prior knowledge. (By author, andragogical 'core principles' Knowles et al, 2015, p.6).

Fig. 8.1 (p.198) offers ways to consider re-imagining academic models of built environment education, a guide to inform other recommendations. As a model, it could be developed into an instantiation to start a *'conversation'* at the beginning, during and at the end of a period of study; or within periods of study at a module/ unit, even assignment level. Fig. 8.1 (p.198) makes particular reference to *'prior knowledge'*, it is the place to begin with Personalisation; using the *'core principles'* (the source) to suit the needs of individual learners, to orientate them with educators through study-related material to inform direction.

With information and knowledge so freely available, I question the relevance of Montessori's age-related *'planes'* today; learners from a younger age have the capabilities but not the framework to support a lifelong education in my view, applicable also to learning later in life. Fig. 8.1 (p.198) re-imagines Montessori's *'planes'*, fusing them with Knowles et al (2015) andragogy model to bring the thinking of both together. It is informed by Ajax's TIPS model, which offers synergies with built environment education being a lifelong endeavour; not defined by one period. As a model, it can be useful for multiple periods of learning, that evolve across different environments.

Montessori's *'planes'* are reflected in Fig. 8.1 (p.198): Personalisation reflects individual needs, attributes and characteristics, those we have and go on to develop working towards a qualification or in practice; Process reflects technology, a framework to methodically evidence progress as outlined with my HNC (Fig. 6.7, p.170); Pedagogy reflects educational theory, ways to approach teaching and learning; to embrace innovative pedagogies like *'lifelogging'*, briefly used within chapter 5. Performance reflects assessment, improving mechanisms to better evaluate learners and programmes. All within a humanistic model that suits both an academic and workplace context, that grows with *'the source'* using it, as they become more aware of how they are learning in *'real-time';* that the gains made can be better realised. Fig. 8.1 (p.198) and further development of a supporting framework offers a significant area to explore for future practice.

A greater focus has come from appreciating the *'science of design'* in this research, from studying my technical and higher education (Simon, 1996, p.138). As a model Fig. 8.1 (p.198) could be utilised within primary and secondary education at school level, it can continue into technical education at college level and further into higher education up to doctoral level; its principles are lifelong, a *'tool'* to support one's own curriculum. This recommendation with others offers significant scope for future research, the visual story of this research has significantly informed the *'path I intend to follow'* in shaping the next chapter of my own curriculum; however, it has more importantly informed me of how I can impact and better support others in developing their own.

Boundaries and limitations

Although autoethnography offers freedom and artistic license, this has been a *'design and build'* project taking me beyond my typical disciplinary boundaries. It could be perceived researching *'self'* is limited, but I would argue that autoethnography in explicitly highlighting any limitations it may have also showcases it's strengths. It is moulded by the skillset and imagination of *'self'* as mastery of it develops, an un-ending process that transcends this research itself; challenging to contain within an artefact bound by assessment constraints and a word limit. But in pushing the boundaries and testing my limits, having the constraints has helped to showcase rather than limit the account this thesis provides I feel. I would like to think that cognitively and pyschologically I am in good health as I look to conclude this research, despite spending two years as six characters; hopefully it brings some realism to the narrative, that my voice(s) resonate, that the story and my use of autoethnography showcases rather than limits my contribution.

With an imagination that knows no limits, autoethnography has helped me creatively focus on what I could realistically deliver in this research. In working with the ethical constraints, it has been necessary to guide the story in a way that it can safely be told. There are other areas that I would like to have explored, but it was important to be guided by what the data was telling me; I could have manipulated the data to force my direction, but that would just create dissonance in *'self'*. I have been able to immerse myself in the data, observe and reflect on experiences shared with others and unlock long-forgotten memories.

A significant limitation could be that it is largely from my perspective, from the data I have I could have approached educators or other students in some way to get different viewpoints on some areas of built environment education; however, I am not sure what this would have added to the outcome at this stage. It is an area that possibly benefits future research more so, that from this period of apprenticeship comes the opportunities to deliver more impactful research with others in the future.

This research in terms of generalisability could be considered limited, but we are all unique, aspects of other peoples lives touch or resonate with us in some way. By focusing largely on the *'science of my design'*, studying artefacts from my built environment education, this thesis showcases skills developed in creating new knowledge in the field of educational research; new skills developed within a doctoral programme. Based on this research, I would suggest the programme offers generalisability, embedded knowledge transmitted through it is communicated through the individual skills developed by artefacts (students). The programme helped find autoethnography, my thesis showcases my use of it and offers *'tools'* others can use to re-imagine their own practice; this in essence is *'output theory'*.

For 4 years my doctoral journey has consumed my life and taken much out of me, but it has put more back in than it has taken out. Within stage 1 of my DProf I explored many areas around curriculum design; the immediacy of my transition from graduate to senior lecturer brought its challenges. The preconceptions I had of industry returning to be a student, were equally present from student to academic; as much as we have experience it can deceive us, play tricks on us.

In analysing comparable built environment courses early, seeing the significant differences in them I thought I had found the direction this research would take, but it brought out something else; that the design of curriculum was not my focus, it was my scepticism of curriculum itself. Rapidly completing my three stage 1 papers over the course of a year I felt I had a good grasp of where I was going, a visual contribution always likely to be offered. In exploring various ways to do this research, autoethnography but design science research more so felt like the *'tool'* I would use moving into stage 2 for this research; then came some headspace, my *'sofastuck'* sabbatical and a period in the wilderness.

> *"There are many ways one can go on a solo journey to the wilderniss beyond and the wilderniss within. If one understands the complex circles of life and the connectedness of all things, then going outside and going inside is really the same journey."*

This quote from Smith (2005) I found within Lemke (2018), adjusting to life with fibromyalgia brought change, my doctoral journey flipped with autoethnography making more sense; stage 1 was my *'thinking gain'* period, stage 2 my *'learning gain'* period. In a world where information we create can seem to be outdated as soon as it is created, autoethnography has kept mine current; initially irrelevant my stage 1 papers became useful, re-imagined in a *'different way'* in chapter 3. Re-imagination does not mean to cast everything aside and start *'anew'*, it means *'connecting-the-dots';* analysing what was and is, to suggest what can be. My *'lived experience'* has been unpacked, bringing moments of surprise and wonder, delightful moments when the penny drops, and you question why do we do that?

Autoethnography has helped me reason with myself, given me *'tools'* I have only begun to scratch the surface within this research; proved itself, to be a worthy *'tool'*, one moulded by my voice and the skills my experience offers. It makes you vulnerable, doubt and question yourself, it requires great ethical focus and mentally challenges, pushing you to explore the world differently; it's taken me into the multiverse, to re-tell the story of my *'lived experience'* through multiple characters. It has unlocked insights spanning over 30 years, it has brought out memories long packed away, reflections on data chronicling a life immersed in built environment education; in doing so it has challenged my beliefs that it needs to be re-imagined, it has made me re-imagine myself.

As a student I consider myself limited in comparison to others, my comprehension at times impinges on my intelligence but thankfully my imagination has bailed me out. Despite my belief built environment education needs to be re-imagined, I feel mine has been a success; it has been more complex than it needed to be; how I have been assessed I do question, but at times it has helped me make sense of things personally, it is part of what I have become. As a researcher, it has brought closure to some aspects of my life, but more opportunities to go and explore.

This research has been part of a doctoral journey that has offered me the most enjoyable educational experience of my built environment education, four years of incredible change. Over the last two years writing this thesis has been a challenging endeavour, rousing many different emotions as I meandered through my life and experiences of built environment education. From school reports at 11 and 13 years old, through my trade apprenticeship, HNC, two degree experiences and a career of nearly 30 years; my doctoral journey started long before my enrolment. School reports outline potential, the knowledge, and skills applicable to higher levels of study. In telling my own story through autoethnography, it has been amusing to reflect on the feedback of others to piece together this research; I mean this in the sense of having the benefit of hindsight to then go on and explain why I may have behaved in a certain way at that time. As an educator it has been useful to trawl through work that I have undertaken as a student, analysing, and reflecting on it from a different perspective; bringing the different perspectives together in this *'conversation'* has been refreshing, but equally it also makes me think of other students who are impacted by poor assessment of them.

I have tried to present my experiences of built environment education as a rollercoaster of ups and downs, moving in different directions. I may have taken an unorthodox path through it, but plenty of others have also, someone else's story will be different, this is what makes us all equally unique; does it make this research any less generalisable? I would argue it does not and that it in its resonance with others we arrive at some common ground; I would suggest it offers the framework and *'tools'* to help others develop and tell their story in their way. This embodies what a true built environment education is in my view, it should offer a platform to explore everything the *'built environment'* has to offer; that programmes are sufficiently flexible, that a curriculum offers freedom to roam and can adapt to support multiple lines of inquiry to explore it at different levels. At a technical level, it should provide a solid foundation to develop from; at a professional level it places great responsibilities on being able to perform competently in practice, but at a higher level comes the opportunity to go further, really challenge the paradigm and current practices whilst better promoting lifelong learning habits.

This thesis showcases the contribution one individual can make, not in trying to reach for the sky with grand gestures, but in observing my own *'lived experience'*; it was not always this way, I thought I could explore everything, then reality bites and I arrived at something unexpected to where I began. To begin with, I was uncomfortable with autoethnography, it put me centre-stage; personally, I prefer not being so visible. However, I would like to think I have got the balance right; that whilst exploring artefacts and models that have been present in my experience, it has distilled my actual presence to some extent.

In doing so I have taken a journey through data others provide, I have '*connected-the-dots'*, meticulously working through and breaking down how different stakeholders have impacted my learning at different times. In doing so it showcases the knowledge and skills developed over a 30-year period, that as an artefact of such a journey I was well placed to critique why I feel re-imagination is necessary; that I have the attributes and characteristics to challenge myself and the status quo. I feel it showcases not just what autoethnography can offer, but also the design of my doctoral programme; that the community and environment it provides is a precedent of what can be for other levels of built environment education.

In '*constructively aligning'* the assessment criteria at doctoral level through my research objectives, has been a framework from which to develop my thesis creatively and imaginatively. In following this path, I have explored many areas I felt were missing from education at different times, particularly in respect to educational theory. This has been an invaluable part of my doctoral journey, exploring theories and pedagogies whilst working in practice has been enlightening. As an undergraduate I became increasingly interested in the science of design, of how models, processes and methodologies really work. It has been fascinating to explore this area further in this research, leaving me with bit of a dilemma; am I a design scientist or an autoethnographer? I have highlighted synergies in fusing them together in this research; I could say I am more design scientist, yet autoethnography has helped me to better understand the *'science of my design'* as an artefact myself. I guess I will always naturally be an autoethnographer because once you start with the method you cannot stop because the story never ends.

This has been a journey of apprenticeship and of preparing for new beginnings. In my own use of autoethnography, I would like to think I have creatively made a small contribution to knowledge and professional practice; a small step towards re-imagining built environment education. Reflecting on the aspirational idea of *'output theory'* it could be suggested myself and my doctoral programme have delivered, that as artefacts there is synergy between us and we have arrived at a state of equilibrium, but to confirm it needs a further *'conversation'*.

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Adams, T., Holman-Jones, S., Ellis, C., 2015. *Autoethnography: Understanding Qualitative Research*. New York: Oxford University Press.

Adler, P. A., P. Adler. 1987. *Membership roles in field research*. Newbury Park, CA: Sage.

AdvanceHE, 2020. *Graduate Attributes Framework* [online]. Available at: https://www.advance-he.ac.uk/knowledge-hub/graduate-attributes-framework [Accessed 14th July 2020]

Ahmad, M., Rahim, L., Arshad, N., 2018. *A review of educational games design frameworks: An analysis from software engineering* [online]. Available at: https://www.researchgate.net/publication/269272852_A_review_of_educational_games_design_frameworks_An_analysis_from_software_engineering [Accessed 1st January 2020]

Anderson, A., 2006. *Analytic Autoethnography Journal of Contemporary Ethnography, Vol. 35(4) p.373-395 doi:10.1177/0891241605280449.* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/0891241605280449 [Accessed 28th January 2020]

Anderson, L., Glass-Coffin, B., 2016. *Learn by Going: Autoethnographic Modes of Inquiry.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.57-83).* Abingdon, Oxon: Routledge

Apple, 2020. *Activity App* [online]. Available at: https://apps.apple.com/us/app/activity/id1208224953 [Accessed 25th June 2020]

Ashby, W. R., 2015. *An introduction to Cybernetics*. USA: Martino Publishing

Aubrey, K., Riley, A., 2016. *Understanding & Using Educational Theories.* London: Sage Publications

Baldwin, J., 1996. *Bucky Works: Buckminster Fuller's Ideas for Today*. USA: Wiley & Sons

Barnett, R., 1994. *The limits of competence: Knowledge, Higher Education and Society*. Buckingham: Open University Press.

Bartleet, D. L., 2016. *Artful and Embodied Methods, Modes of Inquiry, and Forms of Representation.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.443-464).* Abingdon, Oxon: Routledge

Bartuska, T., 2007. *Introduction: Definition, Design, and Development of the Built Environment* [online]. Available at: https://pdfs.semanticscholar.org/ebad/e2fc6bae8ca5c8e825fbbd34e0fef7f27192.pdf [Accessed 1st August 2019]

Bates, B., 2016. *Learning Theories Simplified.* London: Sage Publications

Bates, M., 1989. *The design of browsing and berrypicking techniques for the online search interface, Online Review Vol. 13 No. 5* [online]. Available at: https://www.emerald.com/insight/content/doi/10.1108/eb024320/full/html [Accessed 29th January 2020]

Baxter Magolda, M., 1992. *Knowing and Reasoning in College Students: Gender-related Patterns in Students' Intellectual Development*. San Francisco: Aldine

BBC, 2016. *Heseltine: Industrial strategy should start in schools* [online]. Available at: http://www.bbc.co.uk/news/uk-politics-37619164 [Accessed 14th July 2020]

BEIS, 2017. *Building our Industrial Strategy* [online]. Available at: https://beisgovuk.citizenspace.com/strategy/industrial-strategy/supporting_documents/buildingourindustrialstrategygreenpaper.pdf [Accessed 3rd August 2019]

Berry, K., 2016. *Spinning Autoethnographic Reflexivity, Cultural Critique, and Negotiating Selves.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.209-226).* Abingdon, Oxon: Routledge

BFI, 2020. *Synergetics definition* [online]. Available at: https://www.bfi.org/about-fuller/big-ideas/synergetics [Accessed 1st February 2020]

Biesta, G., 2010. *Pragmatism and the Philosophical Foundations of Mixed Methods Research.* In Tashakkori, A., and Teddlie, C., 2010. *Sage Handbook of Mixed Methods in Social & Behavioral Research (2nd Ed).* Thousand Oaks, California: SAGE

Biggs, J., Tang, C., 2011. *Teaching for Quality Learning at University: What the Student Does (4th ed.).* Berkshire: McGraw-Hill

Birch, D., 2004. *John Ruskin: Selected Writings.* Oxford University Press: Oxford.

Bochner, A. P., 2000. *Criteria Against Ourselves* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/107780040000600209 [Accessed 20th July 2020]

Bochner, A. P., 2016. *Putting Meanings into Motion: Autoethnography's Existential Calling.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.50-56).* Abingdon, Oxon: Routledge

Bolton, G., 2010. *Reflective Practice: writing and professional development (3rd Ed).* London: Sage Publications

Bothwell, E., 2018. *'Sage on the stage' era of university lecturing 'is over'* [online]. Available at: https://www.timeshighereducation.com/news/sage-stage-era-university-lecturing-over [Accessed 4th June 2020]

Boud, D., Lee, A., 2009. *Changing Practices of Doctoral Education.* Abingdon: Routledge.

Bragg, M., 2011. *John Ruskin on Genius.* Hesperus Press: London

Bridgman, T., Cummings, S., Ballard, J., 2019. *Who Built Maslow's Pyramid? A History of the Creation of Management Studies' Most Famous Symbol and its Implications for Management Education, Academy of Management Learning & Education, vol. 18 (1), p.81-98* [online]. Available at: https://journals.aom.org/doi/10.5465/amle.2017.0351 [Accessed 11th July 2020]

British Educational Research Association [BERA], 2018. *Ethical Guidelines for Educational Research (4th Ed. 2018),* London [online]. Available at: https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2018-online [Accessed 14th August 2020]

Bruner, J. S., 1996. *The Culture of Education.* Cambridge, MA: Harvard University Press.

Buckminster Fuller, R., 2010. *Education Automation Comprehensive Learning for Emergent Humanity*. 5400 Baden/ Switzerland: Lars Muller Publishers

Buckminster Fuller, R., 1979. *Synergetics: Explorations in the Geometry of Thinking*. USA: MacMillan Publishing

CABE, 2017. *Accreditation Booklet* [online]. Available at: https://www.cbuilde.com/documents/accredit-your-degree-programme/ [Accessed 19th June 2017]

Carr, W., 1986. *Theories of education and practice, Journal of Philosophy of Education, vol. 20 (2) pp.177-186*. [online]. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-9752.1986.tb00125.x [Accessed 29th May 2020]

Cates, J., 2015. *Synergetics*. [video online] Available at: https://www.youtube.com/watch?v=HzhEMi4vutc [Accessed 16th July 2020]

Chalmers, A., 2013. *What Is This Thing Called Science? (4th Ed.)*. New York: Open University Press.

Chang, H., 2008. *Autoethnography as Method*. Abingdon: Routledge.

Chang, H., 2016. *Individual and Collaborative Autoethnography as Method.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.107-122).* Abingdon, Oxon: Routledge

Chapman, J., 2019. *Why Cybernetics, Why Love?, World Futures* [online]. Available at: https://www.tandfonline.com/doi/pdf/10.1080/02604027.2019.1568796?needAccess=true [Accessed 25th November 2019]

Cherryholmes, C. H., 1992. *Notes on Pragmatism and Scientific Realism, Educational Researcher, vol. 21(6), p.13-17* [online]. Available at: https://www.jstor.org/stable/1176502

CIC, 1998. *Higher Education Common Graduate Learning Outcomes* [online]. Available at: http://old.cic.org.uk/standards/standards/astandards2.aspx [Accessed 8th January 2020]

CIC, 2020. *Standards Directory* [online]. Available at: http://old.cic.org.uk/standards/standards/astandards2.aspx [Accessed 6th January 2020]

CIO, 2018. *Digital transformation is about people, not technology* [online]. Available at: https://www.cio.com/article/3322958/digital-transformation-is-about-people-not-technology.html [Accessed 5th August 2019]

CIOB, 2017. *The Education Framework for Undergraduate Programmes* [online]. Available at: https://www.ciob.org/sites/default/files/CIOB%20Education%20Framework%20for%20Undergraduate%20Progamme%202013.pdf [Accessed 19th June 2017]

CIOB, 2020. *CIOB Undergraduate Education Framework* [online]. Available at: https://www.ciob.org/sites/default/files/CIOB%20Education%20Framework%20for%20Undergraduate%20Programmes%20-%202018%20Edition.pdf [Accessed 5th January 2020]

Clandinin D.J., Connelly, F.M., 2000. *Narrative Inquiry: Experience and Story in Qualitative Research*. San Francisco: Jossey-Bass

Coffey, P., 2017. *Beyond the Silence – Autoethnography An Act of Will*. Wroclaw, Poland: Amazon Fulfillment.

Coghlan, D., Brydon-Miller, M., 2014. *Praxeology. The SAGE Encyclopaedia of Action Research* [online]. Available at: https://methods.sagepub.com/reference/encyclopedia-of-action-research/n265.xml?PageNum=651 [Accessed 26th July 2020]

Collins Dictionary, 2019. *Definition of the 'built environment'* [online]. Available at: https://www.collinsdictionary.com/dictionary/english/the-built-environment [Accessed 1st August 2019]

Collins Dictionary, 2019. *Definition of the 'reimagine'* [online]. Available at: https://www.collinsdictionary.com/dictionary/english/reimagine [Accessed 2nd August 2019]

Costa, E., Soares, A. L., de Sousa, J.P., 2017. *Inductive, deductive and abductive research, and the selected approach* [online]. Available at: https://www.researchgate.net/publication/320716068_Institutional_networks_for_supporting_the_internationalisation_of_SMEs_the_case_of_industrial_business_associations [Accessed 7th July 2020]

Crease, R.P., Goldhaber, A.S., 2014. *The Quantum Moment: How Planck, Bohr, Einstein and Eisenberg taught us to love uncertainty*. Norton: London

Creswell, J.W., Poth, C.N., 2018. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches. (4th Ed)*. Thousand Oaks, CA: Sage.

Cruyff, J., 2016. *Johan Cruyff My Turn*. London: Macmillan

Cullen, R., Harris M., Hill, R.R., 2012. *The Learner Centred Curriculum: Design and Implementation*. San Francisco: Jossey-Bass.

Davies, J. W., 2016. *Skills for Engineering and built Environment Students: University to Career*. London: Palgrave.

Davies, K., 2016. *User Experience Research at Oblong* [online]. Available at: http://www.oblong.com/blog/posts/user-experience-research-oblong/ [Accessed 3rd January 2020]

DBIS, 2013. *UK Construction: An economic analysis of the sector* [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/210060/bis-13-958-uk-construction-an-economic-analysis-of-sector.pdf [Accessed 3rd August 2019]

Denshire, S., Lee, A., 2013. *Conceptualizing Autoethnography as Assemblage: Accounts of Occupational Therapy Practice, Internal Journal of Qualitative Methods, Vol.12(1) pp.221-236* [online]. Available at: https://journals.sagepub.com/doi/10.1177/160940691301200110 [Accessed 25th May 2020]

Denzin, N., 2001. *Interpretative Interactionism* (2nd Ed). London: SAGE Publications

Denzin, N., 2014. *Interpretative Autoethnography*. London: SAGE Publications

Denzin, N., 2016. *A History of Autoethnographic Inquiry.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.57-83).* Abingdon, Oxon: Routledge

Design Council, 2017. *The Design Process: What is the Double Diamond?* [online]. Available at: http://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond [Accessed 19th June 2017]

Designing Buildings Wiki, 2019. *Built Environment Definition* [online]. Available at: https://www.designingbuildings.co.uk/wiki/Built_environment [Accessed 1st August 2019]

Dewey, J., 1910. *The Analysis of a Complete Act of Thought. How We Think*, p.68-78 [online]. Lexington, Mass.: DC. Heath. Available at: https://brocku.ca/MeadProject/Dewey/Dewey_1910a/Dewey_1910_f.html [Accessed 22nd December 2020]

Dewey, J., 1922. *Human Nature and Conduct*. In J.A., Boydston, *The Middle Works of John Dewey, vol.14, 1899-1924*. USA: Southern University Press.

Dewey, J. 1938. *Experience and Education*. New York: Simon and Shuster

Dictionary, 2019. *Definition of education* [online]. Available at: https://www.dictionary.com/browse/education [Accessed 1st August 2019]

Didau, D., Rose, N., 2016. *What every teacher needs to know about psychology*. Woodbridge: John Catt Ltd

Dilworth, S., 2008. *Facilitator presence: an autoethnography* [pdf]. Doctoral thesis. Bournemouth University. Available at: http://eprints.bournemouth.ac.uk/15986/ [Accessed 14th May 2020]

Douglas, K., Carless, D., 2016. *A History of Autoethnographic Inquiry.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.57-83).* Abingdon, Oxon: Routledge

Dresch, A., Lacerda, D.P., Antunes, J.A.V., 2015. *Design Science Research: A method for Science and Technology Advancement.* Switzerland. Springer.

Dunn, 2020. *The Researcher Development Framework: Sow's ear or silk purse?* [online]. Available at: https://www.ox.ac.uk/research/support-researchers/principal-investigators/principal-investigations-blog-pis/researcher-development-framework-sow's-ear-or-silk-purse?wssl=1 [Access 27th June 2020]

Egan, J., 1998. *Rethinking Construction* [online]. Available at: http://constructingexcellence.org.uk/wp-content/uploads/2014/10/rethinking_construction_report.pdf [Accessed 27th December 2019]

Ellingson, L. L., Ellis, C., 2008. *Autoethnography as Constructionist Project*. In Holstein, J.A., and Gubrium, J.F. *Handbook of Constructionist Research (p.445-466)*. New York: Guildford Press.

Ellis, C., 2004. *The Ethnographic I: A Methodological Novel about Autoethnography*. Walnut Creek CA: AltaMira Press.

Ellis, C., 2016. *Revision: Autoethnographic Reflections on Life and Work*. Abingdon: Routledge.

Ellis, C., Bochner, A.P., 2000. *Autoethnography, personal narrative, and personal reflexivity*. In N.K Denzin, Y.S., Lincoln. *Handbook of Qualtive Research (2nd Ed.) (p.733-768)*. Thousand Oaks, CA: Sage.

Ellis, C., Adams, T.E., Bochner, A.P., 2011. *Autoethnography: An Overview* [online]. Available at: http://www.qualitative-research.net/index.php/fqs/article/view/1589/3095 [Accessed 19th July 2020]

Encyclopaedia Britannica, 2019. *Cybernetics* [online]. Available at: https://www.britannica.com/science/cybernetics [Accessed 19th December 2019]

Eraut, M., 1994. Developing Professional Knowledge and Competence. London: Falmer

Etherington, K., 2004. *Becoming a Reflexive Researcher: Using Our Selves in Research*. London: JKP Publishing

Fesmire, S., 2003. *John Dewey and Moral Imagination: Pragmatism in Ethics*. Bloomington: Indiana University Press

Fetterman, 2010. *Ethnography: Step-by-Step (3rd Ed.)*. Thousand Oaks: Sage.

Feyerabend, P., 2010. *Against Method (4th Ed)*. London: Verso

Fletcher, P., Satchwell, H., 2015. *RIBA Stage Guides: Briefing, A practical Guide to the RIBA Plan of Work 2013 Stages 7, 0 and 1*. London: RIBA Publishing.

Frank, A. W., 1995. *The Wounded Storyteller: Body, Illness and Ethics*. London: University of Chicago Press

Fulton, J., Kuit, J., Sanders, G., Smith, P., 2013. *The Professional Doctorate: A Practical Guide*. Hampshire: Palgrave MacMillan

Gannon, S., 2006. *The (Im)Possibilities of Writing the Self-Writing: French Poststructural Theory and Autoethnography, Cultural Studies, Critical Methodologies, Vol.6(4), pp.474-495* [online]. Available at: https://journals.sagepub.com/doi/10.1177/1532708605285734 [Accessed 20th February 2021]

Gannon, S., 2016. *Sketching Subjectivities.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.228-243).* Abingdon, Oxon: Routledge

Garfinkel, H., 1984. *Studies in Ethnomethodology*. Oxford: Blackwell

Garnett, F., O'Beirne, R., 2013. *Putting Heutagogy into Learning. In Hase, S., and Kenyon, C., 2013. Self-Determined Learning: Heutagogy in Action*. London: Bloomsbury Publishing.

Gasparski, W., 1983. *A Praxiological Theory of Design. In Gasparski W., Pszczolowski T. (eds) Praxiological Studies. Theory and Design Library (An international Series of Philosophy and Methodology of the Social and behavioural Sciences), vol.34. Springer, Dordrecht* [online]. Available at: https://link.springer.com/chapter/10.1007/978-94-009-6943-8_15#citeas [Accessed 27th July 2020]

Gerber Jr, A., 2001. *Wholeness on education, Buckminster Fuller and Tao*. Washington USA: Gerber Educational Resources.

Gergen, M., and Gergen, K (2002). *Ethnographic representation as relationships*. In A. Bochner and C. Ellis (Eds.) *Ethnographically speaking: Autoethnography, literature, and aesthetics* [Kindle e-book]. Walnut Creek, CA: AltaMira Press.

Gibbons, M.., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., Trow, M., 1994. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage.

Goodall, H.L., 2000. *Writing the New Ethnography*. Walnut Creek, CA: AltaMira Press.

GOV.UK, 2019. *Education generates billions for UK economy* [online]. Available at: https://www.gov.uk/government/news/education-generates-billions-for-uk-economy [Accessed 3rd August 2019]

GOV. UK, 2018. *Industrial Strategy: Building a Britain fit for the future* [online]. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf [Accessed 5th August 2019]

Grammarbook, 2019. *Hyphens with the Prefix re* [online]. Available at: https://data.grammarbook.com/blog/hyphens/hyphens-with-the-prefix-re/ [Accessed 2nd August 2019]

Gregor, S., Jones, D., 2007. *The Anatomy of a Design Theory. In Journal of the Association for Information Systems, vol. 8(5) p.312-355* [online]. Available at: https://www.semanticscholar.org/paper/The-Anatomy-of-a-Design-Theory-Jones-Gregor/6493953038c9e83ff423df8096ed4f9287443079 [Accessed 31st August 2020]

Gregor, S., Hevner, A., 2013. *Positioning and Presenting Design Science Research for Maximum Impact* [online]. MS Quarterly, vol. 37(2), 2013, pp.337-355 [online]. Available at: https://www.jstor.org/stable/43825912 [Accessed 26th May 2020]

Grosse, H., 2018. *Investigating Trust in the German Construction Industry: A Contractor's Autoethnographic Exploration of Trust and Levinas* [pdf]. PhD Thesis. University of Gloucestershire. Available at http://eprints.glos.ac.uk/7111/ [Accessed 14th May 2020]

Grove, J., 2019. *Academics who work when sick risk burnout, professor warns* [online]. Available at: https://www.timeshighereducation.com/news/academics-who-work-when-sick-risk-burnout-professor-warns [Accessed 7th September 2019]

Guba, E, G., Lincoln, Y, S., 1989. *Fourth Generation Evaluation*. London: Sage.

Guba, E. C., 1990. *The Paradigm Dialog.* Newbury Park, California: Sage.

Halfpenny, A., Petersen, J., 2014. *Introducing Piaget: A Guide for Practitioners and Students in Early Years Education*. Abingdon, Oxon: Routledge.

Hamood, T., 2016. *An autoethnographic account of a PhD student's journey towards establishing a research identity and understanding issues surrounding validity in educational research* [online]. Available at: https://journaleducationalresearchinformedpractice.files.wordpress.com/2014/05/3hamood-june2016.pdf [Accessed 25th November 2019]

Harasim, L., 2017. *Learning Theory and Online Technology*. Abingdon, Oxon: Routledge.

Harland, T., 2012. *University Teaching: An introductory guide*. Abingdon, Oxon: Routledge.
Hart, C., 1998. *Doing a Literature Review: Releasing the Social Science Research Imagination*. London: Sage

Hartree, A., 1984. *Malcolm Knowles' Theory of Andragogy: A Critique, Internal Journal of Lifelong Education, 3:3, p.203-210* [online]. Available at: https://www.tandfonline.com/doi/abs/10.1080/0260137840030304 [Access 18th June 2020]

Hase, S., Kenyon, C., 2013. *Self-Determined Learning: Heutagogy in Action*. London: Bloomsbury Publishing

Hayano, D., 1979. *Auto-ethnography: Paradigms, Problems, and Prospects. Human Organization, vol.38 (1) p.99-104* [online]. Available at: www.jstor.org/stable/44125560 [Accessed. 17th May 2020]

HEA, 2020. *Graduate Attributes Framework* [online]. Available at: https://www.heacademy.ac.uk/knowledge-hub/graduate-attributes-framework [Accessed 22nd January 2020]

Heick, 2020. *The difference between pedagogy, andragogy and heutagogy* [online]. Available at: https://www.teachthought.com/pedagogy/a-primer-in-heutagogy-and-self-directed-learning/ [Accessed 2nd June 2020]

Heritage, S., 2014. *How to be as successful as Obama and Zuckerberg: wear the same clothes everyday* [online]. Available at https://www.theguardian.com/commentisfree/2014/nov/10/obama-zuckerberg-us-president-facebook-founder [Accessed 27th December 2019]

Herr, K., Anderson, G. L., 2015. *The Action Research Dissertation: A Guide for Students and Faculty*. California: Sage.

Hickman, L.A., 1992. *John Dewey's Pragmatic Technology*. USA: Association of American University Press.

Hirsch, E. D., 2016. *Why Knowledge Matters: Rescuing our children from failed educational theories*. Cambridge, USA: Harvard Education Press.

Holman-Jones, S., Adams T.E., Ellis, C., 2016. *Handbook of Autoethnography.* Abingdon, Oxon: Routledge

Horst, W.J., Rittel, Webber, M., 1973. *Dilemmas in General Theory of Planning, Policy Sciences, vol. no.2 193, pp.155-169*. [online]. Available at: www.jstor.org/stable/4531523 [Accessed 26th May 2020]

Hosein, A., Rao, N., 2017. *Pre-professional ideologies and career trajectories of the allied professional undergraduate student* [online]. Available at: http://www.tandfonline.com/eprint/RjrValfSKXwNkfy34UtA/full. [Accessed 30th December 2019]

Hosein, A., 2018. *Employability: Matching professional ideologies and skills* [online]. Available at: https://anesaresearch.wordpress.com/2018/02/05/employability-matching-professional-ideologies-and-skills/. [Accessed 30th December 2019]

Hubbard, E., 2016. *Socrates, Aristotle and Plato: The Story and Work of Great Philosophers.* Creatspace Independent Publishing Platform: LM Publishers

Hughes, S. A., Pennington, J.L., 2017. *Autoethnography: Process, Product, and Possibility for Critical Social Research*. London: Sage

Hughes S.A., Pennington, J.L., Makris, S., 2012. *Translating Autoethnography Across the AERA Standards: Toward Understanding Autoethnographic Scholarships as Empirical Research, Educational Researcher, vol.41(6), p.209-219* [online]. Available at: https://journals.sagepub.com/doi/abs/10.3102/0013189X12442983 [Accessed 20th July 2020]

Ideas to Implement, 2017. *Integrating the Curriculum* [online]. Available at https://ideastoimplement.wordpress.com/?s=integrating+the+curriculum Accessed 28th December 2019]

Infed, 2019. *John Ruskin on education* [online]. Available at: http://infed.org/mobi/john-ruskin-on-education/ [Accessed 17th December 2019]

Ingraham, P., 2019. *A Rational Guide to Fibromyalgia: The science of the mysterious disease of pain, exhaustion, and mental fog* [online]. Available at: https://www.painscience.com/articles/fibromyalgia.php [Accessed 21st July 2019]

Issacs, B., 2018. *Understanding the Montessori Approach.* Abingdon, Oxon: Routledge

Issacson, W., 2007. *Einstein his life and universe.* London: Simon and Shuster

Isaacson, W., 2011. *Steve Jobs.* London: Hachette

Issacson, W., 2017*. Leonardo da Vinci:* The Biography. UK: Simon and Schuster.

Iivari, J., Venable, J.R., 2009. *Action Research and Design Science Research – Seemingly Similar but Decisively Dissimilar. ECIS 2009 Proceedings. 73* [online]. Available at: http://aisel.aisnet.org/ecis2009/73 [Accessed 27th July 2020]

Jahn, R. G., Dunne, B.J. 2001. *A Modular Model of Mind/Matter Manifestations (M5). Journal of Scientific Exploration, vol. 15 (3), p.299-329* [online]. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.625.5259&rep=rep1&type=pdf [Accessed 9th June 2020]

Jahn, R. G., Dunne, B.J. 2007. *A Modular Model of Mind/Matter Manifestations (M5). Journal of Science and Healing, vol. 3 (3), p.311-324* [online]. Available at: https://www.sciencedirect.com/science/article/pii/S1550830707000766 [Accessed 9th June 2020]

Jarvis, M., Chandler, E., 2001. *Angles on Child Psychology.* Cheltenham: Nelson Thornes

Johannesson, P., Perjons, E., 2014. *An Introduction to Design Science.* Switzerland: Springer.

Jones, K., 2019. *A Framework for Assessing Interventions to Promote the Implementation of Material Innovations on Construction Projects* [pdf]. Doctoral Thesis (End.D). UCL (University College London). Available at: https://discovery.ucl.ac.uk/id/eprint/10065623/ [Accessed 14th May 2020]

Kahney, L., 2013. *Jony Ive: The Genius Behind Apple's Greatest Products.* London: Penguin.

Kapp, A. (1833). *Platon's Erziehungslehre als Pädagogik für die Einzelnen und als Staatspädagogik, oder dessen praktische Philosohie* [Plato's educational theory as a pedagogy for the individual and as state pedagogy, or its practical philosophy]. Minden: Essmann [online]. Available at: https://googlescholar [Accessed 13th July 2020]

Kennedy, S., MacPhail, A., Varley, P.J., 2019. *Expedition (auto)ethnography: an adventurer-researcher's journey, Journal of Adventure Education and Outdoor Learning, 19:3, 187-201, DOI: 10.1080/14729679.2018.1451757* [online]. Available at: https://www.tandfonline.com/doi/full/10.1080/14729679.2018.1451757 [Accessed 19th May 2020]

Kelly, A.V., 2009. *The Curriculum: Theory and Practice. 6th ed*. London: Sage

Kerr, M., and Key, D., 2011. *The Ouroboros (Part 1: towards an ontology of connectedness in ecopsychology research. European Journal of Ecopsychology, vol. 2 (1), p.48-60* [online]. Available at: http://eje.wyrdwise.com/v2/EJE%20v2_Full.pdf [Accessed 9th June 2020]

King, S., 2012. *On Writing: A memoir of the craft*. London: Hachette.

Kilpatrick, W. H., 1914. *The Montessori System examined*. New York: Houghton Mifflin. Available at: https://archive.org/details/montessorisystem00kilprich/mode/2up [Accessed 13th July 2020]

Kinman, G. 2017. *Career advice: does change fatigue risk academic burnout?* [online]. Available at: https://www.timeshighereducation.com/news/career-advice-does-change-fatigue-risk-academic-burnout [Accessed 27th December 2019]

Knowles, M.S., Holton III, E.F., Swanson R.A., 2015. *The Adult Learner: The definitive classic in adult education and human resource development 8th ed*. Abingdon: Routledge.

Kolb, D., 1984. *Experiential Learning: Experience as the Source of learning and Development.* New Jersey: Prentice Hall.

Kolb, D. 2015. *Experiential Learning: Experience as the Source of learning and Development 2nd ed*. New Jersey: Pearson.
Knowles, M.S., Holton III, E.F., Swanson R.A., 2015. *The Adult Learner: The definitive classic in adult education and human resource development 8th ed*. Abingdon: Routledge.

Kuhn, T. S., 1996. *The Structure of Scientific Revolutions (3rd Ed.)*. Chicago and London: Chicago University Press.

Kundera, M., 1998. *The Art of the Novel*. London: Faber.

Latham, M., 1994. *Constructing the Team* [online]. Available at: http://constructingexcellence.org.uk/wp-content/uploads/2014/10/Constructing-the-team-The-Latham-Report.pdf [Accessed 27th December 2019]

Lawson, R., 2017. *Transformative Reflection and Reflexivity in Work-based Education* [pdf]. Doctoral thesis. University of Sunderland. Available at: https://sure.sunderland.ac.uk/id/eprint/7828/ [Accessed 14th May 2020]

Lee, S., 2019. *Abductive Reasoning* [online]. Available at: https://www.brown.edu/Departments/Joukowsky_Institute/courses/greekpast/4886.html [Accessed 22nd July 2019]

Lemke, J., 2018. *Exploring Human Nature: A Reflexive Mixed Methods Enquiry into Solo Time in the Wilderness*. Leiden: Sidestone Press.

Lexico, 2019. *Definition of education* [online]. Available at: https://www.lexico.com/en/definition/education [Accessed 31st July 2019]

Lexico, 2020. *Definition of knowledge* [online]. Available at: https://www.lexico.com/definition/knowledge [Accessed 29th May 2020]

Liptan, G., 2016. *The Fibromanual: A complete Fibromyalgia Treatment Guide for You and Your Doctor*. New York: Penguin Random House.

Loeng, S., 2017. *Alexander Kapp – the first known user of the andragogy concept, International Journal of Lifelong Education, vol.36(6), p.629-643,* [online]. Available at: https://www.tandfonline.com/doi/full/10.1080/02601370.2017.1363826 [Accessed 13th July 2020]

Lonberg-Holm, K., Larson, C.T., 1940. *Planning for Productivity*. International Industrial Relations Institute. The Hague, Holland.

Lonberg-Holm, K., Larson, C.T., 1953. *Development Index*. [online]. Available at: https://files.eric.ed.gov/fulltext/ED026808.pdf [Accessed 15th February 2020]

Maes, R., Sylin, M., 2016. *Over-50 returning adult learners: another neglected species? In J., Field, B., Schmidt-Hertha and A., Waxenegger. Universities and Engagement: International Perspectives on Higher Education and Lifelong Learning (p.214-226)*. Abingdon, Oxon: Routledge.

Maslow, A. H., 1943. *A Theory of Human Motivation. Originally published in Psychological Review, vol.50. p.370-396* [online]. Available at https://psychclassics.yorku.ca/Maslow/motivation.htm [Accessed 11th July 2020]

Maslow, A. H., 1954. *Motivation and Personality. Harper & Row publishers* [online]. Available at: https://holybooks.com/wp-content/uploads/Motivation-and-Personality-Maslow.pdf [Accessed 11th July 2020]

Mates in Mind, 2019. *Why is mental health important to organisations everywhere?* [online] Available at: https://www.matesinmind.org/our-programme/research.html [Accessed 24th May 2019]

Matthews, D., 2017. *Academics 'fail to change teaching due to fear of looking stupid'* [online]. Available at: https://www.timeshighereducation.com/news/academics-fail-change-teaching-due-fear-looking-stupid [Accessed 4th June 2020]

McClure, W., Bartuska, T., 2007. *The Built Environment: A Collaborative Inquiry into Design and Planning*. New Jersey: John Wiley & Sons

McDermid, C. D., 1960. *How Money Motivates Men. Business Horizons, Vol.3 (4), p.93-100* [online]. Available at: https://www.sciencedirect.com/science/article/pii/S0007681360800341 [Accessed 11th July 2020]

McKernan, J., 1991. *Curriculum Action Research*. Hogan Page: London

McKernan, J., 2008. *Curriculum and Imagination: Process Theory, Pedagogy and Action Research*. Abingdon, Oxon: Routledge

Merriam, S.B., Caffarella, R.S., Baumgartner, L., 2007. *Learning in adulthood a comprehensive guide. 3rd ed*. San Francisco: Jossey-Bass

Merriam-Webster, 2019. *Definition of reimagine* [online]. Available at: https://www.merriam-webster.com/dictionary/reimagine [Accessed 2nd August 2019]

Metropolis, 2014. *Knud Lonberg-Holm: Buckminster Fuller's Mentor, Modernism's Invisible Architect*. [online] Available at: http://www.metropolismag.com/architecture/knud-lonberg-hold-bucky-fuller-mentor-modernism-invisible-architect/ [Accessed 29th June]

Mind, 2019. *Mental health at work* [online]. Available at: https://www.mind.org.uk/workplace/ [Accessed 6th August 2019]

Minge, J. M., 2016. *Mindful Autoethnography, Local Knowledges.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.425-442).* Abingdon, Oxon: Routledge

Moon, J., 2005. *We seek it here… a new perspective on the elusive activity of critical thinking: a theoretical and practical approach* [online]. Available at: https://www.advance-he.ac.uk/knowledge-hub/we-seek-it-here-new-perspective-elusive-activity-critical-thinking-theoretical-and [Accessed 7th July 2020]

Moors, A., 2017. *On autoethnography. Ethnography, 18(3), 387–389. doi:10.1177/1466138117723354 PMID:30443197* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1466138117723354 [Accessed 21st May 2020]

Montessori, M., 2007. *From Childhood and Adolescence, vol.12* [Kindle e-book]. Amsterdam: Montessori-Pierson Publishing

Montessori, M., 2014. *The Absorbent Mind* [Kindle e-book]. Sublime Books. 2014.

Moss, R., 2019. *Commuting: a life sentence for academics* [online]. Available at: https://www.timeshighereducation.com/opinion/commuting-life-sentence-academics [Accessed 20th June 2020]

Muncey, A., 2005. *Doing Autoethnography. International Journal of Qualitative Methods*, 69–86. https://doi.org/10.1177/160940690500400105 [online]. Available at: https://journals.sagepub.com/doi/10.1177/160940690500400105 [Accessed 21st May 2020]

Myers, M., Venable, J., (2014). *A Set of Ethical Principles for Design Science Research in Information Systems, vol.53(6) p.801-809*. https://doi.org/10.1016/j.im.2014.01.002. [online]. Available at: https://www.sciencedirect.com/science/article/pii/S0378720614000081 [Accessed 18th November 2020]

Nguyen, A., Gardner, L., Sheridan, D., 2019. *Towards Ontology-Based Design Science Research for Knowledge Accumulation and Evolution. 10.224251/HICSS.2019.694.* [online]. Available at: https://www.researchgate.net/publication/332085319_Towards_Ontology-Based_Design_Science_Research_for_Knowledge_Accumulation_and_Evolution [Accessed 27th July 2020]

NHS, 2019. *Fibromyalgia overview* [online]. Available at: https://www.nhs.uk/conditions/fibromyalgia/ [Accessed 17th July 2019]
NorthCube. 2020. *LifeCycle App* [online]. Available at: http://www.northcube.com/lifecycle/press/ [Accessed 25th June 2020]

OfS, 2019. *Student protection* [online]. Available at: https://www.officeforstudents.org.uk/advice-and-guidance/student-wellbeing-and-protection/student-protection/students-as-consumers/ [Accessed 3rd August 2019]

O'Hara, S., 2018. *Autoethnography: The science of writing Your Lived Experience. HERD: Health Environments Research & Design Journal*, vol.11(4), *pp. 14–17* [online]. doi: 10.1177/1937586718801425. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1937586718801425 [Accessed 14th February 2021]

Open University, 2019. The UK skill shortage is costing organisations £6.3billion [online]. Available at: http://www.open.ac.uk/business/apprenticeships/blog/uk-skills-shortage-costing-organisations-£63-billion [Accessed 5th August 2019]

O'Riordan, N., 2014. *Autoethnography: Proposing a new research for Information Systems Research, Proceedings of the European Conference on Information Systems (ECIS) 2014, Tel Aviv, Israel, June 9-11, 2014 ISBN 978-0-9915567-0-0* [online]. Available at: https://pdfs.semanticscholar.org/815c/367ea126c1c48ab69ba1b98165f93535a0a8.pdf [Accessed 21st May 2020]

Osbourne, T., 2013. *Inter that Discipline! in Barry, A. & Born, G. (eds.), Interdisciplinarity: Reconfigurations of the social and natural sciences.* New York: Routledge.

Pangaro, P., 2017. *Cybernetics as Phoenix: Why Ashes, What New Life?* In Werner, C. L., *Cybernetics: State of the Art*. Berlin: University of Berlin.

Pangaro, P., 2019. *Design for Conversations & Conversations for Design 2011* [online]. Available at: http://pangaro.com/conversations-for-innovation.html. [Accessed 25th November 2019]

Pangaro, p., 2019. *What is Cybernetics?* [online video]. Available at: https://vimeo.com/41776276 [Accessed 25th November 2019]

Patrovani, M., 2020. *Making the Shift to Adult Learning: The Three "Gogies"* [online]. Available at: https://www.slideshare.net/MichelleAnnPatrovani/making-the-shift-to-adult-learning-the-three-gogies-081116-65009586/4 [Accessed 4th June 2020]

Patton, M. Q., 2015. *Qualitative Research & Evaluation Methods: Integrating Theory and Practice (4th Ed.).* Thousand Oaks, California: SAGE.

Pawson, R., 2013. *The Science of Evaluation: A Realist Manifesto*. London: SAGE.

Petrick, E. R., 2019. *Building the Black Box: Cyberneticians and Complex Systems* [online]. Available at https://journals.sagepub.com/doi/full/10.1177/0162243919881212 [Accessed 16th August 2020]

Pickering A., 1995. *The Mangle of practice: Time, Agency, and Science*. Chicago: University of Chicago Press

Pickering, A., 2011. *The Cybernetic Brain: Sketches of Another Future*. Chicago and London: University of Chicago Press

Pickering, A., 2013. *Ontology and Antidisciplinarity, in Barry, A. & Born, G. (eds.), Interdisciplinarity: Reconfigurations of the social and natural sciences.* New York: Routledge.

Posner, P., 2009. *The Pracademic: An Agenda for Re-engaging Practitioners and Academics* [online]. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/j.1540-5850.2009.00921.x [Accessed 18th July 2019]

Powers, M., 2017. *Self-Regulated Design Learning*. Abingdon, Oxon: Routledge.

Price, P., Jhangiani, R., 2018. *Correlational Research – Research Methods in Psychology* [online]. Available at: https://opentextbc.ca/researchmethods/chapter/correlational-research/ [Accessed 23rd September 2020]

QAA, 2014. *Guidance on applications for the grant of research degree awarding powers: Academic staff (Criterion 1)* [online]. Available at: https://www.qaa.ac.uk/docs/qaa/guidance/guidance-rdap-academic-staff-mar-2014.pdf?sfvrsn=356f781_6 [Accessed 21st July 2019]

QAA, 2014. *UK Quality Code for Higher Education – Part A: Setting and Maintaining Academic Standards. The Framework for Higher Education Qualifications of UK Degree-Awarding Bodies* [online]. Available at: https://www.qaa.ac.uk/quality-code/qualifications-and-credit-frameworks [Accessed 1st September 2020]

QAA, 2020. *Subject Benchmark Statements* [online] Available at: https://www.qaa.ac.uk/quality-code/subject-benchmark-statements [Accessed 5th September 2020]

Rachal, 2002. '*Andragogy's Detectives: A Critique of the Present and Proposal for the Future'. Adult Education Quarterly, vol.52 (3), p.210-227* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/0741713602052003004 [Access 18th June 2020]

Ramputty, A. 2015, *The continued relevance of a Montessori education in today's society: An auto-ethnographic study*, Nipissing University (Canada) [online]. Available at: https://search.proquest.com/docview/1707669166?pq-origsite=primo&fromunauthdoc=true [Accessed 10th July 2020]

Reed-Danahay, D.E., 1997. *Auto/Ethnography: Re-writing the Self and the Social*. Oxford: Berg.

Reed-Danahay, D., 2009. *Anthropologists, Education, and Autoethnography. Reviews in Anthropology, vol.38, p.28-47* [online]. Available at: https://www.tandfonline.com/doi/abs/10.1080/00938150802672931 [Accessed 11th February 2020]

Reilly, T., Richardson, D., Stratton, G., Williams, A.M., 2004. *Youth Soccer: From Science to Performance*. Abingdon, Oxon: Routledge
RIBA, 2017. *Validation Procedures and Criteria* [online]. Available at:https://www.architecture.com/knowledge-and-resources/resources-landing-page/validation-procedures-and-criteria#available-resources [Accessed 19th June 2017]

RIBA, 2017. *Validation Procedures and Criteria* [online]. Available at:https://www.architecture.com/knowledge-and-resources/resources-landing-page/validation-procedures-and-criteria#available-resources [Accessed 19th June 2017]

RIBA, 2020. *RIBA Plan of Works 2020* [online]. Available at: https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work [Accessed June 5th June 2020]

RICS-BS, 2017. *Assessment of Professional Competence Building Surveying. Aug. 2015* [online]. Available at: http://www.rics.org/Global/20102%20-%20RICS%20APC%20Pathway%20Guide%20-%20Building%20surveying-Aug%202015-WEB.pdf [Accessed 19th June 2017]

RICS-QS, 2017. *Assessment of Professional Competence Quantity Surveying and Construction. Feb. 2015* [online] Available at: http://www.rics.org/Global/20102%20-%20RICS%20APC%20Pathway%20Guide%20-%20QS%20and%20Construction-Feb%202015-WEB.pdf [Accessed 19th June 2017]

Rich, J., 2015. *Employability: Degrees of value. I worked hard to get where I am today (An unemployed graduate with £50,000 of debt* [online] Available at: http://www.hepi.ac.uk/wp-content/uploads/2015/12/Employability-Degrees-of-value.pdf [Accessed 14th July 2020]

Richardson, L., 2000. *Writing: A Method of Inquiry. In N.K., Denzin and Y.S., Lincoln. Handbook of Qualitative Research (2nd Ed)*. Thousand Oaks: SAGE

Richardson, L., (2000). *Evaluating Ethnography. Qualitative Inquiry, vol. 6(2), p.253-255* [online]. Available at: https://journals.sagepub.com/doi/abs/10.1177/107780040000600207#articleCitationDownloadContainer [Accessed 13th December 2020]

Rid, T., 2016. *Rise of the Machines: the lost history of Cybernetics*. London: Scribe.

Rodriquez, E., Shofer, S., Harter, M., Clark, N., 2017. *First guiding Process: Problematizing What You Know for New-Self Insight. In S.A. Hughes, J.L. Pennington. Autoethnography: Process, Product, and Possibility for Critical Social Research (p.58-87).* Thousand Oaks, CA: Sage.

Rogers, C. 1969. *Freedom to Learn*. New York: MacMillan/ Merrill

Romme, G., 2003. *Making a Difference: Organisation as Design. Organisation Science, vol.14 (5), p.558-573* [online]. Available at: https://www.jstor.org/stable/4135149 [Accessed 24th July 2020]

Rothbard, M. N., 2011. *Economic Controversies*. Auburn, Alabama: Ludwig von Mises Institute.

Ryan, L. V., Nahser, F. B., Gasparski, W. W., 2002. *Praxiology and Pragmatism. Praxiology: The International Annual of practical Philosophy and Methodology (vol.10).* Abingdon, Oxon: Routledge.

Schon, D. A., 1983. *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books Inc.

Schön, D. A., 2016. *The Reflective Practitioner: How Professionals Think in Action*. Abingdon, Oxon: Routledge.

Scott, D., Brown, A., Lunt, I., Thorne, L., 2004. *Professional Doctorates: Integrating Professional and Academic Knowledge*. New York: McGraw-Hill
SEDA, 2020. *The Holy Grail for HE – how do we achieve transformational learning (gain) through excellent teaching?* [online]. Available at: https://www.seda.ac.uk/resources/files/27_Naylor.pdf [Accessed 20th June 2020]

Sharples, M., 2019. *Practical Pedagogy: 40 New Ways to Teach and Learn*. Abingdon: Routledge.

Shock Crim, 2020. *Teaching my dad to play Fortnite and getting him a win* [video online]. Available at: https://www.youtube.com/watch?v=ovRtA4fYkLs [Accessed 8th June 2020]

Simon, H., 1996. *The Sciences of the Artificial (3rd Ed.)*. USA: MIT Press

Sinclair, D., 2013. *Assembling a Collaborative Project Team: Practical Tools including Multidisciplinary Schedule of Services.* London: RIBA Publishing

Sleep Cycle, 2020. *Sleep Cycle app* [online]. Available at: https://www.sleepcycle.com [Accessed 25th June 2020]

Smith, NJ., 2009. *Achieving your Professional Doctorate*. Berkshire: McGraw-Hill.

Smith, T. 2005. *Going outside to go inside: Frameworks for the Solo Experience. In C. Knapp, C., and Smith, T., Exploring the Power of Solo, Silence, and Solitude (p.3-18).* Boulder, CO: Association for Experiential Education.

Snyder, M. M., 2015. *Leaning into Autoethnography: A review of Heewon Chang's Autoethnography As Method. The Qualitative Report, 20(2), 93-96*. Available at: https://nsuworks.nova.edu/tqr/vol20/iss2/9/?utm_source=nsuworks.nova.edu/tqr/vol20/iss2/9&utm_medium=PDF&utm_campaign=PDFCoverPages [Accessed 16th May 2020]

Social Synergetics, 2020. *Synergetic Assessment Models* [online]. Available at: http://www.socialsynergetics.com/site/assessment [Accessed 8th January 2020]

SportLab, 2016. *Famous documentary on Ajax training philosophy and fitness training Part 1.* [online video]. Available at: https://www.youtube.com/watch?v=WAL2PB9RNWc [Accessed 25th August 2020]

Spry, T., 2001. *Performing Autoethnography: An Embodied Methodological Praxis. Qualitative Inquiry, vol. 7, 706-732* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/107780040100700605 [Accessed 11th February 2020]

Srivastava, P., Hopwood, N. 2009. *A Practical Framework for Qualitative Data Analysis. International Journal of Qualitative Methodology, 8(1), p.76-84* [online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/160940690900800107 [Accessed 17th December 2020].

Stanford News, 2005. *You've got to find what you love,' Jobs says* [online video]. Available at: https://news.stanford.edu/2005/06/14/jobs-061505/ Accessed 3rd August 2019]

Starr, L.J., 2010. *The Use of Autoethnography in Educational Research: Locating Who we Are in What We Do. Canadian Journal for New Scholars in Education, vol.3(1) p.1-9* [online]. Available at: https://jmss.org/index.php/cjnse/article/view/30477 [Accessed 20th July 2020]

Strum, S., 2018. *The Idea of Total Environment Control*. Abingdon, Oxon, Routledge

Susskind. R., Susskind, D., 2017. *The Future of the Professions: How technology will transform the work of human experts*. USA: Oxford University Press

Syed. M., 2016. *Black Box Thinking*. London, Hachette.

TED, 2019. *Changing education paradigms* [online]. Available at: https://www.ted.com/talks/ken_robinson_changing_education_paradigms [Accessed 5th August 2019]

Tett, G., 2015. *The Silo Effect: Why Every Organisation Needs to Disrupt Itself to Survive.* London: Hachette.

Thayer-Bacon, B., 2012. *Maria Montessori, John Dewey, and William H. Kilpatrick. Education and Culture, vol. 28(1), p.3-20* [online]. Available at: https://www.jstor.org/stable/10.5703/educationculture.28.1.3#metadata_info_tab_contents [Accessed 13th July 2020]

The Edge, 2015. *Collaboration for Change* [online]. Available at: http://www.edgedebate.com/?page_id=2829 [Accessed 5th August 2019]

Throne, L., 2019. *Autoethnography and Heuristic Inquiry for Doctoral-Level Researchers: Emerging Research and Opportunities (Advances in Higher Education and Professional Development)*. USA: IGI Global

Tolich, M., 2010. *A Critique of Current Practice: Ten Foundational Guidelines for Autoethnographers. Qualitative Health Research 20(12), 1599-1610. 20*(12). https://doi.org/10.1177/1049732310376076 [online]. Available at: https://journals.sagepub.com/doi/abs/10.1177/1049732310376076 [Accessed 19th May 2020]

Torraco, R. J., 1997. *Theory Building Research Methods*. In Swanson, R.A., and Holton III, E. F., *Human Resource Development Research Handbook (p. 114-137)*. San Francisco: Berrett-Koehler

Toyosaki, S., Pensoneau-Conway, S, L., 2016. *Autoethnography as a Praxis of Social Justice.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.557-575).* Abingdon, Oxon: Routledge

Trafford, V., Leshem, S., 2008. *Stepping Stones to Achieving your Doctorate: By focusing on your viva at the start.* Maidenhead, Berkshire: Open University Press, McGraw-Hill.

Trahar, S., 2013. *Autoethnographic Journeys in Learning and Teaching in Higher Education. European Educational Research Journal, vol.12(3) p.367-375* [online]. Available at: https://research-information.bris.ac.uk/ws/portalfiles/portal/12014309/Trahar_EERJ_12_3_web_1_.pdf [Accessed 10th February 2021]

Treasure, J., 2012. *Why Architects need to use their ears* [online video]. Available at: https://www.ted.com/talks/julian_treasure_why_architects_need_to_use_their_ears?language=en [Accessed 8th June 2020]

Tullis, J. A., 2016. *Self and Others: Ethics in Autoethnographic Research.* In Holman-Jones, S., Adams, T., and Ellis, C. *Handbook of Autoethnography (p.244-261).* Abingdon, Oxon: Routledge

Ubu Gallery, 2014. *Knud Lonberg-Holm: The Invisible Architect* [online]. Available at: https://www.ubugallery.com/exhibitions/lonberg-holm-invisible-architect/ [Accessed 29th June 2020]

Usher, R., Bryant, I., Johnston, R. 1997. *Adult Education and the post-modern Challenge: Learning Beyond the Limits*. London: Routledge

Vitae, 2020. *Researcher Development Framework* [online]. Available at: https://www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework/vitae-researcher-development-framework-rdf-full-content-graphic-2011.jpg [Accessed 25th June 2020]

Walker, D., 2010. *Being Pracademic – Combining Reflective Practice with Scholarship* [online]. Available at:

https://www.researchgate.net/publication/267995102_Being_a_Pracademic_-_Combining_Reflective_Practice_with_Scholarship [Accessed 16th November 2019]

Walshaw, M., 2012. *Getting to Grips with Doctoral Research*. Basingstoke: Palgrave

Walter, W. G., 1953. *The Living Brain*. New York: W.W. Norton.

Wellington, J., 2015. *Educational Research: Contemporary issues and practical approaches*. London: Bloomsbury.

Westover, T., 2018. *Educated*. London: Penguin Random House.

Wiener, N., 2013. *Cybernetics; or, Control and Communication in the Animal and the Machine (2nd Ed.)*. USA: Martino Publishing.

Wikipedia, 2019. *Cybernetics* [online]. Available at:
https://en.wikipedia.org/wiki/Cybernetics [Accessed 19th December 2019]

Wilson, A. L., Hayes, E. R., 2002. *From the Editors: The Problem of (Learning In-From-To Experience). Adult Education Quarterly, vol. 52(3) p. 173-175* [online]. Available at:
https://journals.sagepub.com/doi/abs/10.1177/0741713602052003001#articleCitationDownloadContainer [Accessed 11th July 2020]

Wilson, B. G., 1997. *Thoughts on Theory in Educational Technology. Educational Technology, vol. 37 (1) p.22-27* [online]. Available at:
https://www.jstor.org/stable/pdf/44428382.pdf?refreqid=excelsior%3A2fc012e16d89fa5263fa980cf34be39c [Accessed 8th July 2020]

Wilson, M. D., 2015. *Pracademia: The Future of the Lifelong Learner. About Campus, 20(2), pp.28-31* [online]. Available at:
https://journals.sagepub.com/doi/full/10.1002/abc.21189 [Accessed 7th April 2021]

Winkler, I., 2017. *Doing Autoethnography: Facing Challenges, Taking Choices, Accepting Responsibilities. Qualitative Inquiry, vol. 24(4) 236-247* [online]. Available at:
https://journals.sagepub.com/doi/full/10.1177/1077800417728956 [Accessed 19th May 2020]

Wolcott, H. F., 2008. *Ethnography: A Way of Seeing (2nd Ed.).* Oxford: AltaMira Press

WordClouds, 2020. *Word cloud graphics* [online]. Available at:
https://www.wordclouds.com [Accessed 11th January 2020]

Wyness, G., 2013. *Higher education in 2013: the year of marketisation-but to what extent?* [online]. Available at: https://www.theguardian.com/higher-education-network/blog/2013/dec/23/higher-education-policy-2013-marketisation [Accessed 3rd August 2019]

Usher, R., Bryant, I., Johnston, R. 1997. *Adult Education and the post-modern Challenge: Learning Beyond the Limits*. London: Routledge

Van Aken, J.E., 2004. *Management Research Based on the Paradigm of the Design Sciences: The Quest for Field-Tested and Grounded Technological Rules, Journal of Management Studies, vol. 41(2) pp.219-246.* [online]. Available at:
https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-6486.2004.00430.x [Accessed 27th May 2020]

Van Maanen, J., 2011. *Tales of the Field: On Writing Ethnography (2nd Ed)*. USA: University of Chicago Press.

Vitae, 2020. *Researcher Development Framework* [online]. Available at: https://www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework/vitae-researcher-development-framework-rdf-full-content-graphic-2011.jpg [Accessed 25th June 2020]

Zou, P.X.W., Sunindijo, R.Y., Dainty, A. R. J., 2014. *A Mixed methods research design for bridging the gap between research and practice on construction safety* [online]. Available at: https://www.sciencedirect.com/science/article/pii/S0925753514001647 [Accessed 29th July 2019]