

*Enacting the chasm: how can educational technology help Secondary teacher educators reflect creatively and reflexively?*

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## **Abstract**

This thesis fuses a portfolio of four peer-reviewed papers, two conference papers and one book with a peer-reviewed chapter. The portfolio examines the act of a teacher educator investigating and writing about educational technology (edtech). The trajectory of the papers develops from studies of specific edtech platforms in the context of teacher education, to positioning the author at the centre of the edtech research. As the focus shifted towards the act of researching and writing about edtech, the later papers became autoethnographic. The portfolio of papers employed mixed methods. There was some quantitative data but the research would later narrow the focus onto qualitative methods of data collection with grounded theory, then thematic analysis as research methodologies. This statement develops the autoethnographic style adopted by the later papers in the portfolio and the autoethnographic account of the process of retrospective PHD by Published Works (O’Keeffe, 2019; Chong & Johnson, 2022). In terms of a theoretical framework, connectivism has been a consistent thread from the practitioner book that precipitated the portfolio to the later autoethnographic work. Connectivism was initially selected to highlight the development of theoretical models in edtech on either side of the pandemic. In this portfolio, I re-examine the overall evidence to progress from critiquing the notion of connectivist learning by writing autoethnographically. This progression leads me to an enactivist process of embodied action (Li, 2012; Van den Berg, 2018). The original contribution to knowledge that the portfolio and its findings makes is to place the researcher at the centre of a study of edtech in the context of Initial Teacher Education (I.T.E). The conclusions’ originality arise from the creation of a model to frame the paradigmatic pluralism identified in recent literature. The SPACESHIP model draws on Kimmons and Johnstun’s (2019) notion of the *multihyphenate* researcher and crystallises how a research journey may be informed by an openness to multiple paradigms while still being mindful of potential contradictions (Kimmons and Johnstun, 2019).

## **Declaration**

*This submission by Peter Frederick Atherton to the Doctoral Academy at Liverpool John Moores University is for PHD by Published Works. This submission, consists of seven outputs and a synthesis statement and is in partial fulfilment of its requirements and according to the guidelines and regulations set out by the Doctoral Academy at Liverpool John Moores University. The seven lead author texts were published in peer reviewed journals, conference proceedings or books between 2018 and 2023 and have not been used in the submission for another research degree.*

*No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning;*



23/6/23

## **Acknowledgements**

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Thanks!

## **Prologue**

This synthesis statement is framed by extracts from T.S Eliot's dramatic monologue - *The Love Song of J Alfred Prufrock* (1917), accompanied by evocative digital images generated on an Open AI platform called DallE2. The reasons why I feel this poem is apt as a companion to my iterative research journey are as follows:

- The poem explores isolation and duality.
- While the reader is invited to participate in a vicarious journey, they are also invited to attend to what is not said.
- The speaker berates himself for presumption.
- The speaker distances himself emotionally on one hand yet indulges his neuroses on the other.
- The poem explores fragmentation and juxtaposes stark imagery.
- The development of the speaker is accompanied by a search for meaning.

The digital images represent the creative freedom that has developed as I have adapted a variety of research methods. They are essentially floating signifiers, the polysemic meaning of which resides in the mind of the reader (Levi Strauss, 1977). The collaborative production of meaning accompanies the work in this portfolio. An element of my creative freedom has been the act of subversion.

I will link these points to this synthesis statement in Section 6 and, in doing so, put together the fragments of imagery, words, research paradigms, theoretical frameworks, literature on either side of the pandemic, mixed methods data, and fast-evolving technologies. The way I hope to achieve this is by interrogating my own positionality throughout my research journey in the context of the literature and my evidence base.

### Extract 1

*Let us go then, you and I,  
When the evening is spread out against the sky  
Like a patient etherised upon a table*



*Image made by me on DallE2 Open AI. Search term: 'Big sky sunset'.*

### Portfolio of published works

- 1) Atherton, P (2018). 'More than just a quiz. How Kahoot! Can help trainee teachers understand the learning process.' TEAN Journal 10(2),pp 29-39.
- 2) Atherton, P (2019). Bridging the chasm – a study of the realities of edtech use among trainee teachers. TEAN Journal 11(4),pp 80-95.
- 3) Atherton, P (2020a). March of the Robots? Artificial intelligence (ai) is part of the mainstream in uk education. but why should anyone care? 12th International Conference on Education and New Learning Technologies, 06 Jul 2020 -08 Jul 2020. EDULEARN Proceedings. IATED. Jul 2020. DOI: 10.21125/edulearn.2020.0152
- 4) Atherton, P (2020b). My social autoethnography: How one teacher educator used digital communication to help tell his own stories. TEAN Journal 12(1),pp 48-64.
- 5) Atherton, P (2022). *Leaving the chasm behind? Autoethnography, creativity and the search for identity in academia*. Prism Journal. Vol 4 No 2. DOI: 10.24377/prism.ljmu.0402212.
- 6) Atherton, P. and Pratt, A. (2022) From reflective models towards collaborative autoethnography. How can social media be used as a pedagogic tool for Secondary student teachers? 14th International Conference on Education and New Learning Technologies. 07 Mar 2022 - 08 Mar 2022. EDULEARN Proceedings. IATED. Mar. 2022. DOI: 10.21125/inted.2022 (80% contribution).
- 7) Atherton, P. (2023). *Goal-Setting and Problem-Solving in the Tech-Enhanced Classroom - A Teaching and Learning Reboot*. New York, NY: Routledge.

Each chapter is research-based and also addresses the implications for the practitioner. This builds on Atherton (2018), *50 ways to use technology enhanced learning in the classroom*. Chapter 5 - has been peer-reviewed

### **Not selected**

- 8) Atherton, P. (2018a). *50 ways to use technology enhanced learning in the classroom*. 1st ed. Exeter: Learning Matters
- It is important to consider the contribution of the practitioner book (Atherton, 2018a, de-selected). This book has had the most impact, especially in terms of citations. It was written to provide a broad focus on pedagogy and edtech, in the context of the research literature and the Teachers' Standards (DfE, 2011). The book listed creative ideas generated by me about how student teachers may improve their pedagogical confidence, assisted by edtech. It is by far the most cited work, with citations across the world in journal papers, conference proceedings and practitioner books.

9) Atherton, P., (2020). Why do teachers need to embrace technology in the classroom?. In: J. Lord, ed., *Studying Education: an introduction into the study and exploration of education*. Exeter: Learning Matters.

This chapter was a viewpoint piece but was not peer-reviewed.

## **Introduction**

I began my research journey as an outsider to both the edtech space and to the institutions in which I was working. My initial research questions were starting to be eclipsed by the need to chronicle my own positionality, with its emerging dualities. As my research embraced autoethnography, this liberated me to attend to the complexities of viewing the researcher and their creations as qualitative data.

I propose that a researcher may thrive from enacting their own research journey by writing autoethnographically, then considering their work through the complementary paradigms of connectivism, rhizomatic learning and enactivism. In terms of replicability, I created a model that other researchers may consider adapting; the SPACESHIP model is discussed and illustrated on pages 73-76. The model illustrates how I have engaged with multiple paradigms, maintaining a healthy scepticism and recognising the distinctions between them. My pluralistic position has



facilitated a deep analysis of intersectionalities, without privileging any single paradigm. As an autoethnographer, I was energised by the creative freedom of deploying narrative writing and digital art as qualitative data. My work is part of an ecosystem of interconnected behaviours, technologies, theories and contexts. I found that the most fruitful way to write about this ontological and epistemological sprawl was to enact rather than represent. I would do this through honest and ethical storytelling in a variety of forms. I would be transparent about the iterative nature of my research journey and the problem-solving required to make sense from a diverse database.

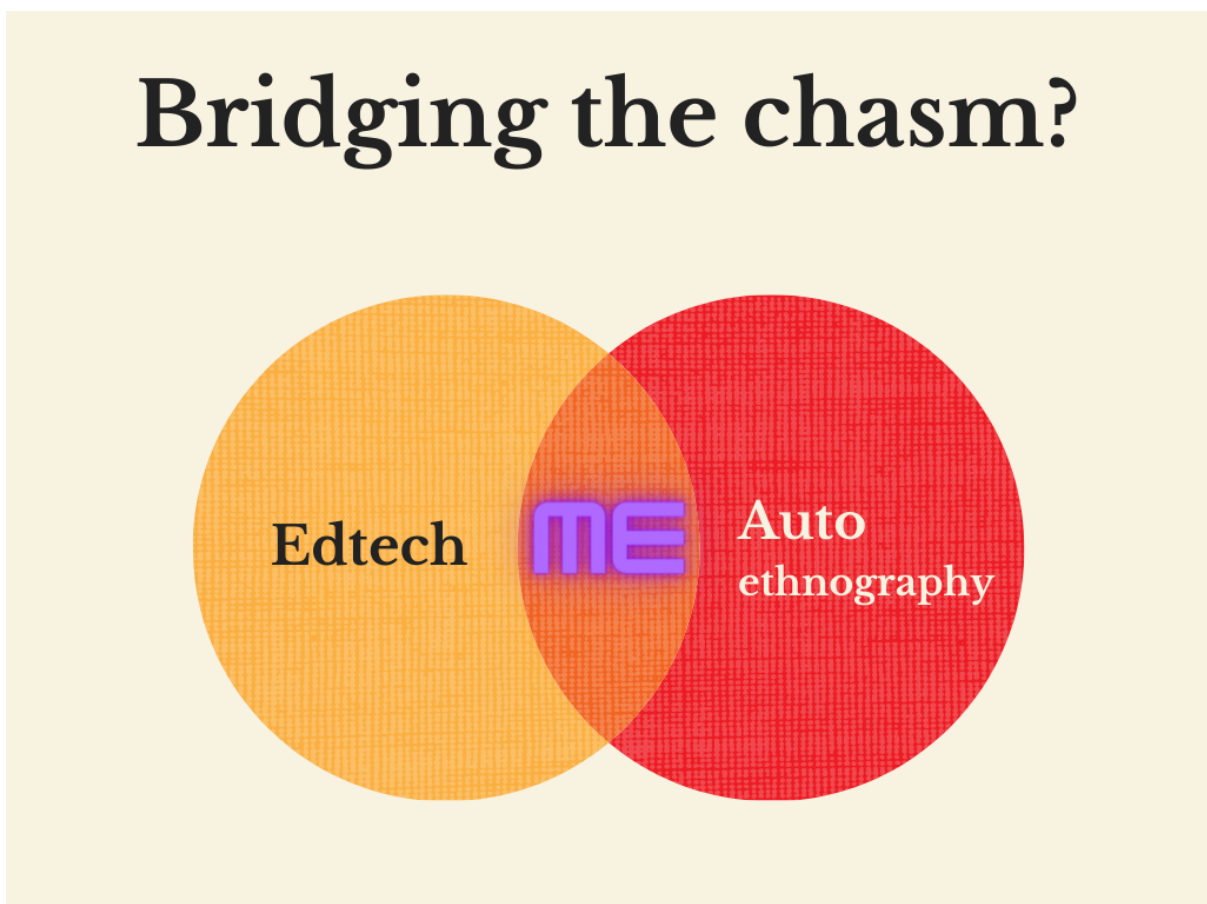
### **1.1 A reflexive teacher educator practitioner research project**

#### **Fig A - Intersectionality of research Venn diagram**

As suggested by the graphic in **Fig A** (pg9), the author of this portfolio is initially positioned in a liminal, transitional space (Stone, Phillips & Jordan-Daus, 2022). This idea of between-ness has helped create an extended metaphor for the entire body of work - a chasm, which the author (from here on, referred to as 'I') is attempting to bridge. It has also helped the process of the selection and synthesis of appropriate literature. Moreover, the chasm metaphor has become a worthy companion to an iterative journey. This synthesis statement will analyse these ideas that have resided in the metaphorical chasm between the following:

- Edtech either side of the pandemic
- Teacher identity vs teacher educator and early career researcher
- Technology use in schools vs the outside world
- The inner self vs the performative social self

Fig A - Bridging the Chasm?



The third bullet point above represents the initial aspect of the chasm that I attempt to bridge here. The papers are foregrounded firstly with a narrow focus on one

specific example of educational technology (Atherton, 2018b). The scope of the overall research then concentrated on student teachers' use of social media platforms as learning tools (Atherton, 2019). Both the research questions and the findings suggested a disconnect between the worlds of technology and the lived experience in education. The later papers in the portfolio built on the initial research questions by using two autoethnographic studies to explore a teacher educator's own journey from teacher to teacher educator with a research interest in edtech. The papers developed the emphasis on storytelling and research methods but were still very much situated in ITE.

Three of the papers were published in the peer-reviewed international Teacher Education Advancement Network (TEAN) Journal, which is targeted at teacher educators. A further paper was published in the Prism Journal, an international open access peer-reviewed journal with a diverse and innovative education remit. Two were conference proceedings at INTED (International Technology, Education and Development conference). Though all papers are situated in the context of edtech in ITE, the literature objectives became increasingly global in scope as I considered the sometimes fragmentary studies that were being conducted across the world of edtech (Atherton, 2023).

I have been the solo author for all but one of the selected papers, and for all of the deselected works. I was solely responsible for conceiving and planning the initial ideas, seeking ethical approval, gathering and analysing data, initial writing, submitting for peer review, redrafting and final submission. I was lead author for the sixth paper, which was co-written with Andrea Pratt. Andrea was responsible for

analysing data and reviewing literature on reflective practice; this paper was one of two that were part of the proceedings for an international conference. The papers that were submitted to the T.E.A.N and Prism journals and Routledge followed appropriate processes of selection, screening, anonymous peer review and editorial feedback.

### **1.2 Overview of the portfolio of papers**

Each of the papers explored the role of a beginning teacher educator in the context of edtech in Secondary schools. The research was conducted in two universities in the north of England and straddled the pandemic. While the research precipitated further questions about the effects of the pandemic on teachers' identity and the role of edtech in the classroom, it was important that these debates did not overpower the others.

The significance and development of the questions that have resided in the chasm can be summarised as follows, in **Fig. B below**.

**Fig B: summary of papers - research methods, connectivism and chasm metaphor**

Paper	Research methods	Relevance of connectivism	Relevance of the chasm
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1. Atherton (2018)	Mixed: online questionnaires /interviews	<p>Edtech may help learning if the mind is an <i>ecology</i>, a network that technology helps make connections (Siemens, 2005, pp 26-27).</p> <p>Emphasis on diverse opinions and decision making, instead of the fixed acquisition of knowledge (Donnelly, 2010; Siemens, 2005; Huang, Bhayani and Go, 2014)</p>	<p>Between beginning teacher educator and researcher.</p> <p>Between use of tech in and outside schools</p> <p>Between skills required in the workplace and those developed by student teachers and teacher educators</p> <p>Between the research and the pedagogical worth and functionality of the edtech tool</p>
2. Atherton (2019)	<p>Mixed: online questionnaires /interviews</p> <p>Social analytics</p>	<p>An attempt to view in the context of other theoretical frameworks (e.g digital positivism, instrumentalism, Web 4.0). To make a case for adopting autoethnographic methods for two of the next papers and to move away from excessive data (Fuchs, 2017).</p>	<p>Between beginning teacher educator and researcher.</p> <p>Between use of tech in and outside schools.</p> <p>Between skills required in the workplace and those developed by student teachers and teacher educators</p> <p>Between instrumentalist notions of the value of data versus edtech as an enhancer of effective pedagogy.</p> <p>Between connectivist notions that edtech enhances serendipity of knowledge and the traditional and teacher-centred reality of children's learning is (Blin and Munro, 2008, cited in Kirkwood and Price, 2013).</p>

3. Atherton (2020a)	Systematic review: conference proceedings	Developed in Atherton (2023) in a chapter that draws on Downes' (2020) method of using review data as an interpretive exercise to explore trends	<p>Between beginning teacher educator and researcher.</p> <p>Between use of tech in and outside schools.</p> <p>Between adoption of tech globally and use in UK schools.</p> <p>Between instrumentalist notions of the value of data versus edtech as an enhancer of effective pedagogy.</p> <p>Between the pre-pandemic edtech world and the pandemic.</p>
4. Atherton (2020b)	Autoethnography Grounded theory	Back references to papers 1 & 2 but not reprised here in favour of autoethnography	<p>Between beginning teacher educator and researcher.</p> <p>Between use of tech in and outside schools.</p> <p>Between instrumentalist notions of the value of data versus the lived experience.</p> <p>Between the pre-pandemic edtech world and the pandemic.</p> <p>Between the entangled self and the public persona.</p>

5. Atherton (2022)	Autoethnography  Thematic analysis	Reprised critique in the context of digital autoethnography to 'help understand their place in the digital ecosystem' (Atherton, 2020b, p51). Here, knowledge is a connected, negotiated process (Siemens, 2005; Downes, 2012; Shukie 2019). Digital autoethnographies can update the theory of connectivism by celebrating the portability and connectivity of recording devices to help create knowledge that is both created and curated (Atay, 2020; Dunn and Myers, 2020; Hunter, 2020; Clark, 2020). As far back as 2012, however, Downes (2012) warned of the potential anarchy of such an ecosystem as whose body of knowledge is fluid.	Between beginning teacher educator and researcher.  Between the entangled self and the public persona.  Between use of tech in and outside schools.  Between the pre- and post-pandemic edtech world.
6. Atherton & Pratt (2022)	Mixed: online questionnaires /interviews  (developing data from Atherton (2019)  conference paper	Because texts are polysemic, meaning making can be viewed as collaborative, negotiated and interactive. The thinking draws on connectivism (Atherton, 2018a, 2018b; 2023; Shukie, 2019)..	Between beginning teacher educator and researcher.  Between use of tech in and outside schools.  Between instrumentalist notions of the value of data versus edtech as an enhancer of effective pedagogy.  Between the pre- and post-pandemic edtech world.
7. Atherton (2023)	Mixed, see Fig. C,D pg 22 and 32	Revived and partially resolved through Shukie (2019) and in the synthesis chapter in the book, entitled, <i>The chasm bridged. The start of an edtech journey?</i>	Between the chaos of connectivist learning spaces and the educational culture of imposing an illusion of order, control, compliance and standardisation.

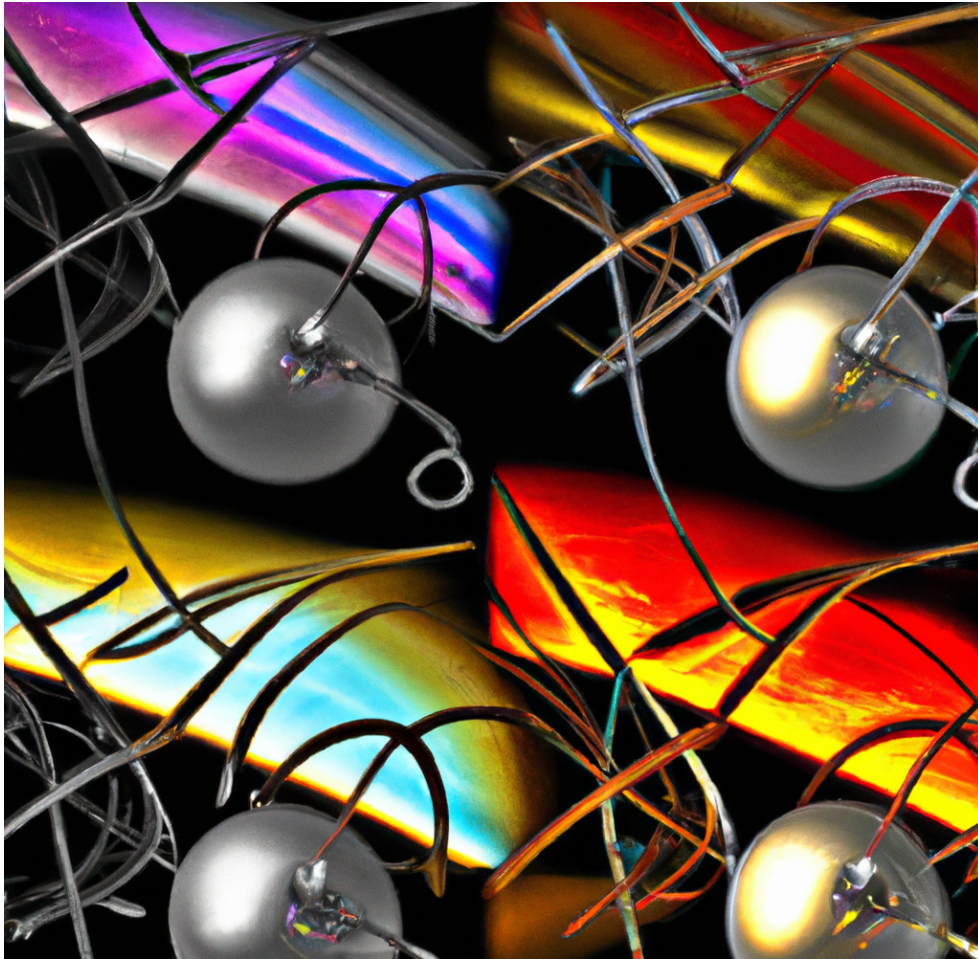
As a body of work, the papers debate the following issues:

- Mixed research methods
- The importance of narrative writing in developing reflective models
- The role of the researcher in the production of research
- The usefulness of autoethnography in producing rigorous research
- The emerging skills that teacher educators need as they support their students with their use of technology
- How teacher educators form their identities in relation to technology
- The extent to which qualitative inquiry may help teacher educators construct a coherent identity.

## Extract 2

*To lead you to an overwhelming question ...  
Oh, do not ask, "What is it?"  
Let us go and make our visit.*





*Image made by me on DallE2 Open AI. Search term: 'possibilities edtech'*

### **1.3 Research questions**

After close examination of the literature, data, methodologies and conclusions from the portfolio, the following research questions emerged as overarching themes:

**RQ1:** What are the emerging skills that teacher educators need as they support their students in their use of technology and how do these contribute to the formulation of identities?

**RQ2** How has the 'chasm' been a space of both creative opportunities and challenges in shaping the researcher's academic identity?

**RQ3** How can qualitative inquiry help teacher educators construct a coherent identity?

**RQ4** What emerging paradigms and research methods are attempting to interrogate the edtech space and what are their benefits and limitations?

The research questions were a common thread in each paper, from the earlier practitioner research papers on edtech platforms to the autoethnographic papers on a teacher educator researching and writing about edtech. This statement will explore responses to these research questions.

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## **2. Relevant literature**

The intention of this section will be to draw together the ideas and research methods explored through the overall literature, to propose conclusions and to contextualise the literature in the context of the trajectory of the writing, from the published papers to Atherton (2023).

### **2.1 Competing definitions of edtech**

The earlier papers (Atherton, 2018; 2018a, 2019) examined the taxonomies and definitions of edtech and their uses as pedagogic tools (Katsipataki, 2011; Ingle and Duckworth 2013; Hamilton & Friesen, 2013; Higgins, ZhiMin Xiao & Kirkwood & Price, 2013; Passey, 2014; Bayne, 2015). While the intention may have been to research potential improvements to Secondary pupils' progress, there was a paucity of literature that could prove this (Luckin, 2018a; 2021; Luckin & Kent, 2019; Atherton, 2023). Not only did the literature reveal scant evidence of edtech improving

progress, there was very little coherence between studies in terms of geography, theoretical frameworks or edtech tools. Much of the research was iterative in nature and examining fast-evolving technologies which sometimes produced hasty conclusions (King et al, 2016; Baker, Smith and Anissa, cited in NESTA 2019; Atherton, 2018a; 2019; 2023). The pandemic problematised this further, as the literature stifled the development of existing paradigms like constructivism yet did not propose new ones (Atherton 2023). The data that was being interrogated on either side of the pandemic was at risk of being outdated or contradictory (Colleoni, Rozza, Arvidsson, 2014; Barber, 2016; Atherton 2023). Furthermore, any attempt to bridge the chasm of contested taxonomies and the hybridity and fluidity of edtech lingered into later papers and into Atherton (2023)

These initial literature objectives became inseparable from my own positionality, as operating as an English specialist teacher educator writing about technology. I strove to develop my understanding by immersing myself ethnographically in the subject matter (Atherton, 2023). This would pave the way for the later adoption of enactivism as a theoretical framework (Li, 2012; Van den Berg, 2018; Atherton, 2023).

How I used enactivism to form a bridge over the chasm is summarised in **Fig C** (pg31).

## **2.2 Debunking the digital natives debate?**

A departure point for the literature in this portfolio (Atherton, 2018;b) was to contest the notion of the digital native, the idea that people who grew up using the internet are better suited than their parents to the expected behaviours around technology

(Prensky, 2001; 2012). One of these behaviours was a heightened cognitive agility (Uygarer, 2016; Ingle and Duckworth, 2013), which lent itself to multitasking and analysing complex problems. The initial usefulness of the theory was in examining how digital technologies had changed the learning culture. While the theory was not rooted in empirical evidence, had been extensively debunked and was seventeen years old when this body of work began, it was still used frequently in schools and universities and in the research literature. This may have been problematic at first but it enabled me to prioritise more recent studies; this accelerated as the pandemic changed the landscape.

While this portfolio departs from the debate, it still has some lingering relevance in the ongoing and iterative quest to define and frame digital literacies that are necessary in order to use edtech successfully. Indeed, Prensky himself (2012) called for 'digital wisdom', through which digital technologies would help young learners improve their cognition, improve collaboration and provide a more interactive learning experience. This helped move the portfolio further away from this debate, as in Atherton (2019), I emphasised that the chief limitation of this theory is its tendency to create age-based dichotomies (Lanclos, 2016). My sample of postgraduate student teachers were not selected by their age. Such dichotomies were revealed to be reductionist at best and prejudiced at worst.

At the same time, the theory may lack hard evidence but a great deal of current research into education is predicated on the notion that effective learning is essentially bringing about cognitive change (DfE, 2019a;b). This may lead others to

re-evaluate the digital natives debate in light of this. Indeed, a search on Google Scholar for journal articles from 2022 using the search term 'digital natives' returned four hundred and five results in June 2022. Furthermore, a search on a university's library search engines for the term 'digital natives' in the title returned 117 results in March 2023. The topic is clearly far from buried, despite widespread criticism. While this portfolio acknowledges the distance travelled since Prensky's oft-quoted but non-empirical work in 2001, future work may need to be aware of how the debate continues to evolve. A chapter in Atherton (2023) - considers the theory but warns that claims that edtech brings about improvements in pedagogical outcomes are potentially naive, oversimplified or misleading. Similarly, this portfolio acknowledges the duality that Prensky (2001; 2012) was proposing, an effective chasm between digital native and digital immigrants. Indeed, there is evidence in the literature that increasing social and economic inequalities exposed during the pandemic have widened the digital divide. This widening divide has been identified as between state schools and their deprivation indices (Allier-Gagneur, McBurnie, Chuang & Haßler, 2020; Coleman, 2021; Atherton, 2023).

### **2.3 Connectivism**

Connectivism is a conceptual framework that has bookended this portfolio, from the practitioner book (Atherton, 2018a), to the latest book (Atherton, 2023). In Atherton (2018; 2019), I used connectivism to frame the use of some edtech tools in the classroom. In a connectivist learning culture, the mind is an ecology. Technology helps connect this ecology (Siemens, 2005, pp 26-27; Boyraz and Ocak, 2021;

Atherton 2023). The mixed methods findings in Atherton (2018a) matched one of the tenets of connectivism: instead of acquiring static knowledge, the connectivist learning environment places greater emphasis on diverse opinions and on students' decision making around limitless knowledge (Donnelly, 2010; Siemens, 2005; Shukie, 2019). The paper investigated how connectivist thinking may help student teachers develop the skills required to question and assess their pupils and transcend recall and low order thinking. This thinking may be underpinned by skills that have been discussed in the literature as essential for the 21st Century, such as creativity, collaboration, citizenship, communication, digital literacy, problem-solving and productivity (Atherton, 2018a; 2023).

Both the practitioner book (Atherton, 2018a) and Atherton (2018b) identified a widening chasm between outdated concepts, changing skills needed in the workplace and those acquired by student teachers and teacher educators. This chasm widened even more when I examined social media (Atherton,2019; Atherton and Pratt, 2022; Atherton, 2023). Policy literature emphasised cognitive science, didactic teaching and linearity and this was at odds with the notion of amorphous, serendipitous knowledge. While connectivist thinking acknowledges the technology-enhanced serendipity of knowledge in the digital age, much of the reality of pupils' learning is traditional and teacher-centred (Atherton, 2018a; b; DfE 2019a;b; Ofsted, 2022). This has led to more government control of pedagogy and content, as educational policy is situated in an 'evidence era' where a dominant rationalised myth centres on the use of 'evidence' to justify practice' (Helgetun & Menter, 2020 p88).

In Atherton (2019), I viewed connectivism alongside debunked theories like the digital natives debate (Prensky, 2001; 2012) and some theoretical models that would be explored in later papers and Atherton (2023), for example digital positivism and Education 4.0 (Salmon, 2019; Luckin and Kent 2019; Kirkwood and Price, 2014). In Atherton (2019), I reflected changing literature objectives in that the writing was starting to prioritise more recent literature. Indeed, in Atherton (2019), I did not develop literature on connectivism, not necessarily as a departure point but to make a clearer case for adopting autoethnographic methods for two of the next papers (Atherton, 2020a; 2022a) and two chapters in Atherton (2023). Atherton (2019) was clearly an attempt to begin to narrow the focus of the research; this perceived chasm between the potential of edtech and the realities of education were at risk of creating unwieldy datasets and unfocused conclusions. Indeed, this idea of an echo chamber effect (Colleoni, Rozza, Arvidsson, 2014) helps explain the lived experience of a learning theory like connectivism (Goldie, 2016; Atherton, 2023).

### Extract 3

When I am pinned and wriggling on the wall,  
Then how should I begin  
To spit out all the butt-ends of my days and ways?  
And how should I presume?



*Image made by me on DallE2 Open AI. Search term: 'Anxious man'.*

## **2.4 Narrative writing and enactivism**

I became interested in narrative writing as a companion to empirical research in Atherton (2018a, de-selected). This aligned well with my own interests and skills. My interest in this approach deepened when I discovered some of the most illuminating qualitative data in Atherton (2018 and 2019), which came from student teachers' stories about their experiences with edtech in the classroom. This led me to shift the direction of my research towards autoethnography.

Narrative writing is a valuable tool for creating rigorous and engaging qualitative research from narrative data. However, in order for it to be considered credible



research, it must have a recognised structure. I am aware that there is a persistent risk of being accused of self-indulgence when using narrative writing, as the self becomes a narrative text. To gain credibility, I drew from existing structures such as Nash and Bradley's (2011) four-part structure of scholarly personal narratives (SPN): presearch, me-search, research, and we-search (Atherton, 2020a p49; Atherton, 2023). The literature here is linked to issues of diversity and social justice (Long and Hylton, 2017; Wall, 2016; Wall, 2008; Sparkes, 2000). It was the desire to develop the tools with which to analyse the qualitative data within a 'three dimensional narrative inquiry space' that led to a research interest in autoethnography (Clandinin and Connelly, 2000, p131; Atherton, 2023). The literature on narrative writing is problematised by the innumerable niches and identities that are interrogated by authors (Atherton, 2023). Indeed, a deconstruction of the self leads to a reconstruction of the self (Ellis and Bochner, 2010; Struthers, 2014; Atherton, 2023). I achieved this reconstruction of the self through an enactivist entanglement of the self and an ethnographic placing of the self at the centre of my research are analysed in **Section 5** (Anderson, 2006; Li, 2012; Van den Berg, 2018; Voutsina et al, 2021; Stilwell & Harman, 2021).

#### **Extract 4**

*And this, and so much more?—*

*It is impossible to say just what I mean!*

*But as if a magic lantern threw the nerves in patterns on a screen:*

*Would it have been worth while*

*If one, settling a pillow or throwing off a shawl,  
And turning toward the window, should say:*

*“That is not it at all,  
That is not what I meant, at all.”*



*Image made by me on DallE2 Open AI. Search term: 'children leading donkeys.'*

## **2.5 Autoethnography**

Atherton (2020a; 2022a) were both autoethnographic papers and the interest in autoethnography developed as a natural extension of the narrative writing in the

introduction of Atherton (2018a) and the data analysed from the participants in Atherton (2019).

The use of autoethnography did not constitute a paradigm shift, as the taxonomical challenges persisted (Atherton, 2023). I was drawn towards how the literature frequently reflected how autoethnography can provide a sense of creative freedom for the researcher; I could then aspire to findings that were exploratory, not confirmatory (Ellis and Bochner, 2000; Denzin and Lincoln, 2011; Gruzd, Paulin and Haythornthwaite, 2016; Atherton, 2020a; 2023). To address this and to impose order onto a seemingly amorphous database, I considered the various categories of autoethnography, so I could narrow my focus. Despite this, my own autoethnographic work in Atherton (2020a) became a hybrid of the following:

- analytic autoethnography - with the researcher at the centre (Ellis and Bochner, 2006; Anderson, 2006; Struthers, 2014).
- evocative autoethnography - which chronicles the evolving, iterative self (Ellis and Bochner, 2006; Rorty, 1982; Heehs, 2013).
- the emerging genre of digital autoethnography - in which the researcher endeavours to understand their place in a digital milieu (Atay, 2020; Dunn and Myers, 2020; Panther, 2022, cited in Anteliz, Mulligan and Danaher, 2022).

Themes around building new paradigms, emerging theories, contested and hybrid definitions and the role of the educator vis-a-vis technology continued the patterns identified in the literature in the earlier papers in the portfolio (Atherton, 2018; 2019; 2020a). I synthesised the themes of emerging paradigms and theoretical frameworks and fluid taxonomies with the earlier papers and other autoethnographic works (Atherton, 2018; 2019; 2020a; Atherton, 2023). Atherton (2022) is an autoethnographic paper that views the digital, qualitative data as a component of a fluid ecosystem (Siemens, 2005; Downes, 2012; Dunn and Myers, 2020; Hunter, 2020; Clark, 2020; Atherton, 2023). Digitally produced autoethnographic texts, then can develop connectivist notions that negotiation around knowledge is more important than static facts (Atherton, 2018a; b; 2019; 2023). In counterpoint to this, in Atherton (2022), I selected Downes' (2012) contention that too much fluidity can create an anarchic body of knowledge that is impossible to navigate.

In Atherton (2020a), I used grounded theory to propose a new theory, that of the social *bricoleur*. This was an update to Hebdige's (1979) notion of the *bricoleur*, who recontextualises and reappropriates cultural meaning from disparate elements. My qualitative and quantitative data was drawn from social media interactions and analytics. In that sense, my social media interactions create a sense of a social *bricoleur*, where my social persona was assembled from a set of performative communications (Hebdige, 1979). The intention of this was to impose order and resist simplistic categorisation (Baker & Nelson, 2005, in Di Domenico et al, 2010; Atherton, 2023). The process of grounded theory is discussed in **Section 3** (page 32).

## 2.6 Summary

In the **Conclusions and Recommendations** section in Atherton (2019), I was aware that the role of the practitioner as researcher may help build bridges between education and technology and also challenge the reliance on voluminous data. Hence, there is a call for autoethnographies from educators as researchers. This challenge to a culture of digital positivism (Fuchs, 2017, Atherton, 2018a) was initially seen as a way to address the digital divide and to build a culture in which resistance and possibility can flourish (Atherton, 2018a; Denzin and Lincoln, 2011).

The common and emerging themes in the literature that have informed this portfolio can be summarised as follows (Atherton, 2023 pp187-190). The literature across this portfolio demonstrates that terminology related to edtech is fluid and characterised by hybridity as technologies converge and produce fresh iterations (Atherton, 2023). Studies span the globe and lack coherence and this has made the identification of gaps difficult, even redundant (Atherton, 2023). There is a paucity of UK-based studies, particularly in Initial Teacher Education (ITE) and subject level.

A problem that started to present itself in this portfolio became much more prominent in Atherton (2023). A notable example of this is the systematic review presented at INTED 2020 (Atherton, 2020c). This review was developed considerably in Atherton (2023). Some of the findings and research problems have been common across

much of the literature in the portfolio and many more will be covered under 'emerging themes' below. The above themes have helped answer the research questions, when synthesised with the research methodologies. For example, the earlier works were exploring connectivism as a theoretical model. I discovered through thematic analysis of my papers that my portfolio had developed considerably from connectivism. The reasons for this were that the notion of connectivism did not solve the initial research problems.

I would later revisit connectivism in the context of Atherton (2023). Furthermore, I would seek complementary theoretical literature in my portfolio and Atherton (2023). In Atherton (2023), I revisited connectivism to contextualise the emerging literature on edtech (Goldie, 2016; Shukie, 2019). In an attempt to bridge a theoretical and epistemological chasm, connectivism did not fully answer the research questions. Autoethnography went further but the positioning of the researcher at the centre of an amorphous, fluid knowledge base, led me towards enactivism and rhizomatic learning. I will contest the validity of these theoretical frameworks in **Sections 3, 4 and 5** (pg 32 onwards)

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### **3.1. Methodology and researcher standpoint**

In this section, I will summarise my research methodologies. The research developed the focus from small-scale practitioner research to autoethnographic

study. The autoethnographic papers acted as a bridge between small-scale practitioner research narrative writing and a tighter focus on research methods. In order that the portfolio felt as coherent as a conventional PHD thesis, I drew together the discussion and conclusions sections from each paper to identify common themes, essentially viewing the papers as data on which to draw fresh conclusions (O'Keeffe, 2019).

My research standpoint, therefore, became an undoing, rethinking, a reframing and a challenge to positivism. The body of work that comprises this portfolio consistently questions ways in which a great deal of social science research can be empiricist, oppositional and hierarchical (Ellis and Bochner, 2006; Atherton, 2020a p50). My contention here arises from social research in the education space. The iterative journey of adapting my methodology to suit my own positionality and the fast-changing subjects under investigation led me to researcher standpoints that share a single golden thread. Once I had triangulated my theme, this led me to multi-perspective meta-interpretations' (Cohen & Manion, 2010, cited in Smith, 2015, p.91). These are discussed in more detail in Section 5 (page 37).

While Atherton (2018a; 2018b; 2019) explored the developing skills of the student teacher and teacher educator, Atherton (2020a and Atherton 2022b) placed the researcher at the heart of the study. This use of narrative writing to open up lines of critical inquiry has informed the structure of Atherton (2023), in which each chapter contains a short section entitled '*narrative account of the author's own experiences.*' Where this unites some of the established and emerging themes is by fusing the status of the researcher as participant in the process of navigating his way around

the process of systematic review. This statement is partly a reflection of a pursuit of a coherent yet emergent methodology.

### **3.2 Mixed methods research**

The portfolio of papers submitted in **Section 1** used mixed methods to investigate new and emerging edtech and pedagogy from the perspective of a beginning teacher educator and early career researcher. I used online surveys and interviews for Atherton (2018; 2019; 2022a and Atherton and Pratt, 2022) and systematic review in Atherton (2020a). In the autoethnographic papers, I used multimodal texts as primary data and grounded theory in Atherton (2020b) and thematic analysis in Atherton (2022b). The quantitative and qualitative findings informed each step of the research portfolio. The findings in the peer reviewed journal papers and conference proceedings developed from the ideas and recommendations in the practitioner book. Similarly, those findings also informed the more focused methods deployed in Atherton (2023). To illustrate this iterative journey to my research focus, I have represented the research methods deployed in Atherton (2023) in **Fig. C** below:

**Fig. C – Summary of chapters for Atherton (2023), including research methodologies**

**1 Introducing the chasm**



Narrative writing/ summary of research methods

**2 March of the robots? AI in practice**

Applies and deconstructs the process of systematic review.

**3 Virtual insanity? Is virtual reality still the future of education?**

Case study/ transcript of podcast interview

**4 Hooked on dopamine? Learning through failure in game design**

Narrative review and viewpoint piece **Kahoot!**

**5 Search smarter? Leveraging Pinterest for learning**

Mixed methods and thematic analysis.

**6 The tip of the iceberg? Social media in education**

**7 What is your edtech journey? Autoethnography and the importance of learning journeys**

Viewpoint piece and case study

**8 Blockchain, edtech and learning communities**

Case studies

**9 Rhizomatic learning: Pearltrees and online curation tools**

A theoretical piece.

**10 Podcasting in education**

Narrative review

**11 Edpuzzle: Online video for learning – questioning and online assessment**

Case study

**12 Conclusions: Edtech and education – moving forward together**

Draft synthesis statement

The autoethnographic papers' primary data was informed by quantitative data from social media tools, social media and by multimedia art from desktop publishing platforms like Canva. Furthermore, this synthesis statement is framed by extracts

from a dramatic monologue, accompanied by my own digital art. This more autonomous and promiscuous method of data collection may be viewed as ‘an act of resistance to the positivist model of commoditised communication from academics.’ (Metcalfe, 2019; O’Keeffe, 2019; Atherton, 2023 p188). Indeed, this adoption of post-qualitative inquiry borrows from postmodernism and also informs the intersecting theme of rhizomatic thinking later in the portfolio (Deleuze & Guattari, 1987; St Pierre, 2013; Atherton 2023). This resistance can also be observed through the hybridity of the research methods used in Atherton (2023). I found freedom in the iterative and mixed research methods in each chapter. This promiscuity mirrors some of the themes arising from the literature in the entire portfolio (Kimmons and Johnstun, 2019).

### **3.3 Research paradigms**

The portfolio begins with challenging the dominant paradigm of constructivism, which draws from authors such as Piaget (1953). Constructivism in this context is a social activity that helps researchers examine contemporary issues (Babbie, 2016). While *social* constructivism is firmly established, constructivism is a paradigm that is concerned with ways in which specific societies and experiences explain reality (Punch, 2014; Crain, 2010; Stabile and Erschler, 2015). In that respect, it would seem to be a suitable way to investigate edtech. Furthermore, the social constructivist classroom positions the educator as more of a facilitator than an instructor (Chen, 2012); learning is dialogic, creative and collaborative. This portfolio

is interrogating the notion that technology may serve as a catalyst to this way of learning (Donnelly, 2010). These ideas were closely aligned with the direction of the research in Atherton (2018b).

Constructivism may be considered a dominant paradigm in education and this portfolio initially departs from it. While the adoption of connectivism represented a concern with more collaborative and dialogic learning, it was also discussed alongside rhizomatic learning (Donnelly, 2010; Onchwari & Keengwe, 2018; Atherton, 2023). A summary of the connections between these models can be seen in **Fig. D** and **Fig. F**. Constructivism will be revisited in the section on constructivist grounded theory. Other perspectives that became more relevant as the portfolio became more coherent were instrumentalism and positivism. I will firstly discuss the relevance of instrumentalism.

Instrumentalism views technology as an unstoppable, natural force and ideologically neutral (Lanclos, 2016; Atherton, 2023 p189). This application of instrumentalism is explored further in the section entitled, 'Refinement of literature and research methods' in Atherton (2023):

*Where instrumentalism views raw data as a valued predictor of truth, positivism posits that data from the social sciences should be analysed in the same ways as the physical sciences.*

(Atherton, 2023 p189)

In Atherton (2020a), I challenged the positivist notion that narrative writing draws on memory and experience, which can be trusted as qualitative data (Atkinson, Coffey & Delamont, 1999; Ettore, 2005; Muncy, 2010). In Atherton (2020a), I drew conclusions by citing some of the literature on *digital* positivism, which is characterised by the swift accumulation of big data (Fuchs, 2017). I referred to the notion of the tyranny of data in Atherton (2018; 2018a; 2019). This idea was developed further in Atherton & Pratt (2022) and the peer reviewed chapter in Atherton (2023). Both papers addressed the epistemological choice of rejecting the pursuit of objective, universal truths through empirical data (Struthers, 2014; Ellis et al, 2011). This conclusion was drawn from some of the quantitative data in the previous two papers. An alternative paradigm of *critical digital research* is proposed in recent literature (Fuchs, 2017; Colleoni, et al, 2014; Wyly, 2014) I address the limitations of digital positivism in Atherton and Pratt (2022) and the peer reviewed chapter in Atherton (2023), which is developed further in 'Refinement of literature and research methods' in Atherton (2023).

Neither instrumentalism nor positivism could lead me to finding my truth. How I discovered my truth was through *enacting* the chasm in which I reside. This is explained in more detail in Section 5. Enactivism emerged from the natural sciences and draws on the embodied nature of phenomenological research. Latterly, it is viewed as a 'philosophy of nature' (Meyer & Brancazio, 2022). My adoption of enactivist thinking eschews social constructivism's reductionist focus on cognitivist knowledge (Li, Clark and Winchester, 2010; Van den Berg, 2018; Ward et al, 2017). Furthermore, my research challenges Cartesian notions of research participants offering a representation of objective reality. Indeed, some more recent work on

enactivism views the traditional, cognitivist model of research as a stereotypical process of a supposedly impartial observation of an ethical experiment (Voutsina et al, 2021). Instead, my portfolio may be viewed through an enactivist lens, where linguistic interactions are embodied by their speakers, as opposed to being observed from afar. While this is far from a paradigm shift - a repudiation of cognitivism - my varied qualitative data may be analysed less through the computational lens (Meyer & Brancazio, 2022).

My research gains an immediacy and inevitability as a language enactor of my world, rather than a language representer. The ensuing writing would then be analysed as a poet might attend to the words on the page and embody their meaning (Haskell, Linds & Ippolito, 2002). This idea is borne out in the theoretical and mixed methods chapters in Atherton (2023) that use podcast interviews as raw data.

Enactivist thinking, then, recognises the co-emergence of knowledge (Li, 2012). The entanglement of the self in my own research can be deconstructed in this way.

Enactivism may be viewed as both a theoretical framework and a research methodology (Voutsina et al, 2021). If my research is enactivist, it is because my knowledge arises from the interaction of people, systems and their environment, as a form of evolving sense-making (Stilwell & Harman, 2021 p2). It became clear through analysis of my dataset that the realist ethnographic placing of the self in the edtech space became part of the cognitive process of sense-making (Anderson, 2006; Stilwell & Harman, 2021 p2; Van den Berg, 2018):

*We and the world are mutually specifying and co-emerging. Reality is dependent on the consciousness of the knower who determines the meaning.*

(Li, Clark and Winchester, 2010 p409).

The embodiment and co-emergence of enactivism, therefore, complements the fluidity of *connectivism*. Both connectivism and rhizomatic learning view knowledge through the lens of a participatory culture (Siemens, 2005; Li, 2010). Connectivist thinking began this portfolio but became more relevant as the research was conducted on either side of the pandemic. The enduring relevance of connectivism to this portfolio can be summarised thusly:

*.....knowing is no longer a fixed object to be acquired, but rather a process where knowledge is acquired and used to create meaning and problem-solve in the context in which the learner should act.*

Boyraz and Ocak (2021) p1122.

If my epistemological journey has witnessed a co-emergence of knowledge (Li, 2012), it has been the result of deep reflection after consideration of several paradigms and methodologies. This deep reflection has been on the paradigmatic pluralism that has driven and underpinned the data collection and narrative inquiry (Atherton, 2023). This *multi hyphenate* approach to research acknowledges the limitations of positivism:

*Multihyphenates attempt to tackle problems by situating themselves deeply in disparate paradigmatic communities but struggle with the complexity that such a self-contradicting approach requires.*

Kimmons and Johnstun, 2019 p640

At the end of section 6,(pg 45) I propose a model - the SPACESHIP mode - to crystallise this multihyphenate approach to my portfolio and how I have embraced and dwelled within this struggle, which is essentially the metaphorical chasm (Atherton, 2023). The model is an acronym - SPACESHIP - and can be viewed in Fig H initially on page 72, then in more detailed form, in Fig I on page 75.

#### **Extract 5**

Though I have seen my head (grown slightly bald) brought in upon a platter,  
I am no prophet — and here's no great matter;



*Image made by me on DallE2 Open AI. Search term: 'Clowns' heads on a kitchen table in the style of a Cezanne still life'.*

### **3.4 Data collection**

The quantitative data in Atherton (2018a; 2019), Atherton & Pratt (2022) and Atherton (2023) was collected in similar ways and with similar strengths and limitations. Where data was being collected from student teachers as participants, it was from Kahoot! Quizzes, Kahoot! Surveys, online questionnaires on Surveyhero or interviews. The online data collection made initial coding a straightforward process. The data from Kahoot! quizzes and surveys could be exported to Excel files. It was serendipitous that there were fewer opportunities for face-to-face research during 2020 and 2021, in light of the pandemic. These external realities necessitated a shift to more remote methods of data collection, for example outsourcing the recording of audio or online surveys using Surveyhero. This data was part of a pilot study, which is discussed in the section on ethics below.

The autoethnographic qualitative data was the product of my own narrative writing and multimedia images. The narrative writing began as a free-flowing journal about my feelings about my recent experiences in education. It was then augmented by some images and texts that I had created using Canva - a desk-top publishing app (Atherton, 2018a). The consciously polysemic images encouraged not only deeper reflection on my part but invited readers to participate in the production of meaning. The collection of this qualitative data was iterative and a collage of images from templates, graphics and text that I had written. The ensuing data worked as a meme



- a subversive, imitative text that was intended to bridge the chasm between my own interior thoughts and my performative public persona (Clark, 2020; O'Keeffe, 2020). The freedom and creativity of the data collection encouraged deep reflection on the chasm in which I reside. Again, data collection methods used in Atherton (2023) are represented in **Fig. B and D**.page 9-11 and 35. These provided a route into enactivism as one of the interlocking theoretical frameworks (Stilwell, 2021), the ethical implications for which are examined below.

### **3.5 All Research is Ethics and the Road to Enactivism**

The process of ethical approval was informed by the notion that research is neither impartial nor innocent (Sikes & Piper, 2010). The early papers (Atherton, 2018b; 2019) necessitated an application to the University Research Ethics Committee and distribution of Participant Observation Forms. The full process of ethical approval was delineated in Atherton (2018b; 2019) and established the need to maintain a sense of transparency, mutual respect, accountability and moral responsibility (BERA, 2011; Tolich & Sieber, 2013). These guidelines were followed throughout the portfolio. The data that I collected online, via Kahoot! Quizzes, Kahoot! Surveys or online questionnaires required informed consent. Participants could only grant consent once they had written confirmation that their anonymity would be preserved (Brooks et al, 2014).

Ethical approval was granted under a Minimal Risk application. This was the result of referral to Proportionate Review on completion of a university decision tool. The only provisos were that, in light of Covid-19 protocols - there would be no face-to-face

interviews. This approval related to the student teachers being asked to record their voices for what would be a pilot for a future collaborative autoethnography. This project is foregrounded in Atherton (2023). Three items in the portfolio were autoethnographic (Atherton, 2020a; 2022a; 2023 - *Chapter 8*). All were judged by UREC (University Research Ethics Committee) as not needing ethical approval. However, the pilot project for Atherton (2020a) consisted of a transcription of an interview with me about working conditions in education. The interview was conducted by a colleague as part of their MSC research. The transcript needed to be de-selected as the data was too personal and potentially damaging for deconstruction or reflexive analysis. This helped me consider the ethics of autoethnography a little more carefully.

The ethics of the autoethnographic papers, then, drew from relational ethics, which balances UREC and BERA guidelines with the researcher's own ethical code and responsibilities (Ellis, 2007). The validation by ethical approval aided clarity, rigour, transparency and replicability. The autoethnographic works diverge from conventional academic journal papers in light of specific ethical challenges regarding the collection and presentation of data. Atherton (2020b) discusses how traditional empirical inquiry requires the researcher to follow ethical guidelines (BERA, 2011; Tolich & Sieber, 2013). These guidelines were followed in Atherton (2018;2019) and Atherton & Pratt (2022). The autoethnographic papers (Atherton, 2020b; 2022) and autoethnographic content in Atherton (2023) presented fresh ethical challenges regarding the selection of participants and sampling. When samples are self-chosen and narratives are personal, there is a need to modify names, identities, timings, and the context and location of critical incidents. I based characters on multiple

individuals, thus creating composite events with composite participants (Adams, 2015; Ellis, 2007). I pursued relational ethics, where the autoethnographer commits to upholding dignity, trust, and ensuring no harm to others (Ellis, 2007; Adams, 2015). The referenced tweets were solely my creations, and any mention of other individuals was excluded from the dataset.

A useful reconsideration of ethics arose from my research into enactivism. As a consequence, I see parallels with second language learning, where the Protean impossibility of fully grasping the subject matter entangles me in an 'ethical relationship of self and other' (Haskell, Linds and Ippolito, 2002 p22). *Protean* refers to the myth of Proteus, which I used as a framing device for my early enactment in the world of edtech in Atherton (2018a):

*The Myth of Proteus is sometimes invoked as a framing device for the problems teachers face when trying to keep up with new technologies. In Greek mythology, Proteus was a sea-God, who had the gift of omniscience. Proteus changed shape, taking an elusive liquid form, which made him virtually impossible to catch.*

(Atherton, 2018 pXIV)

The start of my research journey was far from a search for an omniscience akin to Proteus. Moreover, I could not aspire to find an anchor that would fix my knowledge. Instead, my writing attempted to examine edtech from a position of embracing the fluidity of technology (Siemens, 2005; Atherton, 2018a;b; 2019). I was pursuing knowledge that I would help develop. Conversely, the world of edtech and later my own entanglement in it would be 'perpetually adrift in relational motion' (Haskell,

Linds and Ippolito, 2002 p2). I became aware that, as I will discuss in **Section 5**, I have been co-emerging with the research process throughout. In terms of ethics, my research would be 'the site of an ongoing ethical event', in which all parties are potentially implicated (Haskell, Linds and Ippolito, 2002 p1).

### **3.6 Quantitative analysis**

The primary focus of this portfolio is qualitative data analysis. There are, however, useful examples of quantitative data, which has usually been explored as part of a mixed methods research project. Atherton (2018b) and (2019) both began with an emphasis on quantitative data. The pilot study for Atherton (2018b) required participants to take part in a Kahoot! online quiz, via an access code. As the quantitative data was exported to an Excel file, it could be analysed numerically. The answers were sometimes contradictory or irrelevant but this enabled me to refine the questions for the qualitative interviews and to triangulate between both forms of data (Bassegy, 2007). In the aforementioned paper and in Atherton (2019) and Atherton & Pratt (2022), I analysed significant quantitative data. Coding the qualitative data was made easier by Surveyhero's paid features, which generated pie charts, data tables and word clouds (Dolowitz, Buckler and Sweeney, 2008). I applied in vivo coding, to help organise the qualitative data and develop research-informed proposals. Again, the findings were sometimes contradictory or redundant. The data determined further lines of inquiry, which were analysed through subsequent qualitative questions (Punch, 2014; Gruzd, Paulin and Haythornthwaite, 2016).

Two of the autoethnographic papers (Atherton, 2020a) and (2023 - *Chapter 8: What is your edtech journey? Autoethnography and the importance of learning journeys*)

made use of Twitter Analytics as qualitative data. The use of thematic analysis as a research methodology helped me harness complex data. I could begin to code the quantitative data in a way that would help me analyse the qualitative data, for example, the use of a mind map to link my schedule to my Twitter activities and the ensuing graphic that I used as qualitative data in Atherton (2020a). The use of grounded theory gave legitimacy and structure to the analysis of both forms of data (Denscombe, 2007; Belgrave and Seide, 2019; Charmaz, 2006; 2014). Grounded theory is discussed in more depth in Section 3.7. The analysis of the same Twitter analytics went further in Atherton (2023) but this time, through thematic analysis. The in vivo coding (Braun and Clarke, 2019) helped me analyse all the data line by line (Cohen, Manion and Morrison, 2010; Saldaña & Omasta, 2016). I could then align these social media metrics with my overall research focus by placing them in the context of the fluidity of identity and the complexity of multimodal communication (McCosker, 2017; Atherton, 2023).

### **3.7 Qualitative analysis**

The portfolio made effective use of some quantitative data, which will be evaluated in this section. It was the qualitative data, however, that started to drive and clarify the research questions. At times, there was an overlap between quantitative and qualitative data. Moreover, Covid-19 necessitated a change in research strategy, which manifested itself firstly in desktop research about artificial intelligence (A.I) (Atherton 2020a). In a narrower focus on autoethnographic study, I preferred narrative analysis as a more efficient and focused way to analyse qualitative data,

especially when considering the self as a narrative text (Watts, 2005; Wall, 2008; Ellis, Adams, & Bochner, 2011; Atherton, 2020a).

Atherton (2020a) was a review of the literature on A.I in education. This was a precursor to two chapters in Atherton (2023). Atherton (2020a; 2020b) and the chapter in Atherton (2023) that develops from Atherton (2020b), found that using grounded theory as a research methodology helped arrive at potentially illuminating theories and self-knowledge. The reason for choosing grounded theory in Atherton (2020a; 2023) was to provide order to a dataset drawn from the sprawling, fragmented literature on A.I. To expand on this, in Atherton (2020b) I felt that the primary qualitative data carried with it an underlying risk of indulgence. The reasons for this were that subjective autobiographical writing like this can sometimes be subject to participant bias, for example hindsight bias (Le Roux, 2016; Anderson, 2006). I judged that this dataset required rigorous and realist coding, through grounded theory (Denscombe, 2007; Belgrave and Seide, 2019). Grounded theory is a methodology in which the researcher conducts an inductive analysis of their qualitative data and generates a theory from it (Charmaz, 2006, 2014). This theory can be drawing on existing research paradigms or could be the researcher's own (Babbie, 2014). The theoretical concept explored in the autoethnographic paper using grounded theory was that of the *social bricoleur*, who constructs a new identity from disparate elements of social media (Hebdige, 1979; Atay, 2020). This theory developed in response to experiences and literature during the pandemic. The *social bricoleur* gave way to reflections and theories more related to the embodiment of the

researcher, for example embodied imagination. Embodied imagination inverts the Western notion that action follows thought (De Garmo, 2020). The research was beginning to head towards enactivism, which is examined in Section 5.

The dataset in Atherton (2020a) was from a selection of narrative writing of my own experiences in the form of a mock novel, 'Confessions of a portfolio careerist' and also my Twitter posts over a transformative six month period. The use of grounded theory added legitimacy, rigour and focus to both the narrative writing and quantitative data. The paper developed the themes of edtech use in ITE but this time, the findings pointed towards the potential benefits of deploying autoethnographic methods as reflection tools. I developed the idea that the digital persona can help us understand our own journey. The digital and social self, therefore, becomes our perception of ourselves. I endeavoured to challenge any assumptions of the primacy of quantitative data; the application of mixed methods helped maintain a sense of rigour, as there were quantitative metrics from Twitter Analytics and qualitative data from narrative writing (Wall, 2008; Ellis, Adams, & Bochner, 2011).

Essentially, the papers that deployed grounded theory were a development from the starting point of constructivism. Constructivist grounded theory was selected as the most apt for Atherton (2020a), as there are no firm generalisations arising from the data, only an 'interpretive understanding' (Denzin and Lincoln, 2011:p 366). Furthermore, Sections 5 and 6 conclude that the emerging chasm in which I reside was initially groundless. A proposed alignment between connectivism, enactivism and rhizomatic learning constitutes an attempt to smooth the edges of a fluid edtech

ecosystem while anchoring the research. This shift from groundlessness to anchoring is represented in Fig F page 45.

Thematic analysis has been used to code and analyse qualitative data in preference to grounded theory in some cases. The reasons why will be discussed in this section. Atherton (2022a) examined visual narratology as a way of presenting qualitative primary data, to explore complex social issues through unique experiences (Culshaw, 2019; Hunter, 2020). The paper developed the theme of narrative writing and focused on research methods to examine how a teacher educator can explore their experiences using autoethnography. This paper developed the structure and methodology in Atherton (2020a) which placed greater emphasis on narrative writing as qualitative data. While Atherton (2020a) used grounded theory as a methodology, Atherton (2022) applied thematic analysis. The reviewers recommended a much greater emphasis on an exploration of the methods of data collection and also suggested thematic analysis as a more methodologically robust and rigorous way of analysing the qualitative data. Acting on this advice, I applied reflexive thematic analysis, to discriminate between redundant and relevant data, restrict the lines of inquiry, then attempt to make generalisations (Braun and Clarke; 2019). I was mindful of the risk of researcher bias but embraced Braun and Clarke's (2019) idea that the researcher is an active agent in the production of meaning (Atherton, 2022 p70).

The ongoing theme of a bridge over a chasm is developed in this paper. Gibbs' (1988) model of reflection is used as a bridge between student teachers'



experiences and their individual stories. In the book chapter in Atherton (2023) - *Search smarter? Leveraging Pinterest for learning*, I developed the conference proceedings paper (Atherton & Pratt, 2022). Again, the context was a purposive sample of ITE student teachers (Denscombe, 2007). As Atherton & Pratt (2022) was something of a departure from traditional models of reflection (Gibbs, 1988), this chapter was freed from the constraints of this framework. Significant experience of ITE students deploying this model often felt perfunctory and generic (Atherton, 2023). The mixed methods dataset of the chapter develops the use of reflexive thematic analysis in Atherton (2022a). Through this, I consciously identified and analysed semantic and latent codes (Braun and Clarke, 2019), to organise the qualitative data and narrow the focus (Denscombe, 2007; Punch, 2014; Braun and Clarke, 2019; Atherton, 2021). As I, as the researcher, was involved in the production of meaning, there may have been a risk of subjectivity and researcher bias. This was minimised, however, by the use of some quantitative data and the avoidance of undue prominence of specific comments by participants.

The latent, or underlying codes (Braun and Clarke, 2019) helped develop the theme of a chasm between the social media use of student teachers and their pupils outside lessons. This also revealed inequities regarding access and connectivity (Atherton 2020b; 2022), which were exacerbated as the digital divide widened during and after the pandemic (Allier-Gagneur, McBurnie, Chuang & Haßler, 2020; Coleman, 2021; Atherton, 2023). What was missing from the data but relevant to a debate about the findings could be the status of social media as an ideologically neutral technological tool (Selwyn, 2014; 2020; Bayne, 2014; Lanclos, 2016). In terms of methods for further research, there is evidence that the mixed methods

approach could benefit from incorporating a greater proportion of narrative writing, to amplify the complementary empirical data (Cresswell, 2013; Sidebottom, 2019).

While the long-term impact of this synthesis is impossible to predict (Smith, 2015), the likely impact of the work using thematic analysis is to contribute to emerging debates about personalised and remote learning post Covid-19. In addition to this, the related collaborative autoethnography will be with student teachers of English. The participants will provide an innovative way of formatively assessing reflections on and knowledge of the Core Content Framework (DfE, 2019) and the Ofsted English Research Review (DfE, 2022).

My initial interest in collaborative autoethnography is derived from the easy collection and coding of qualitative data in Atherton (2019). A pursuit of collaborative autoethnography was considered as a methodology that could potentially bridge the chasm between education and technology. The pandemic, however, curtailed opportunities for researchers to build the trust required for participants to engage in qualitative research about their lived experience (Atherton, 2023).

Atherton and Pratt (2022) developed data from Atherton (2019) to reassess a traditional reflective model as a framework for examining student teachers' use of one social media platform in the classroom. The paper was presented at the INTED international conference in March 2022. The conclusions proposed collaborative autoethnographies as a valid way of interrogating the ontological and epistemological questions that arise from qualitative data.

This study refined the research questions from the first and second paper. The use of Gibb's (1988) Model of Reflection was used to frame the questions but also to help formulate a new way of enabling student teachers to reflect. The desired cyclical nature of the reflection was interrupted by Covid and its ensuing term as, 'scholarly challenges' (Roy and Uekusa, 2020, p384; Atherton and Pratt, 2022). My response to these challenges was to place greater emphasis on autoethnography and online data collection.

To conclude this section, the evidence suggests that the taxonomies, definitions of social media surrounding edtech continue to be problematic and contested semantically, epistemologically, ontologically and ideologically. These taxonomic tensions were addressed in Atherton (2023), through literature on either side of the pandemic. Both Atherton and Pratt (2022) and Atherton (2023) called for ongoing practitioner research into specific social platforms, preferably in the context of Secondary Initial Teacher Education. The outcomes of the portfolio are discussed below.

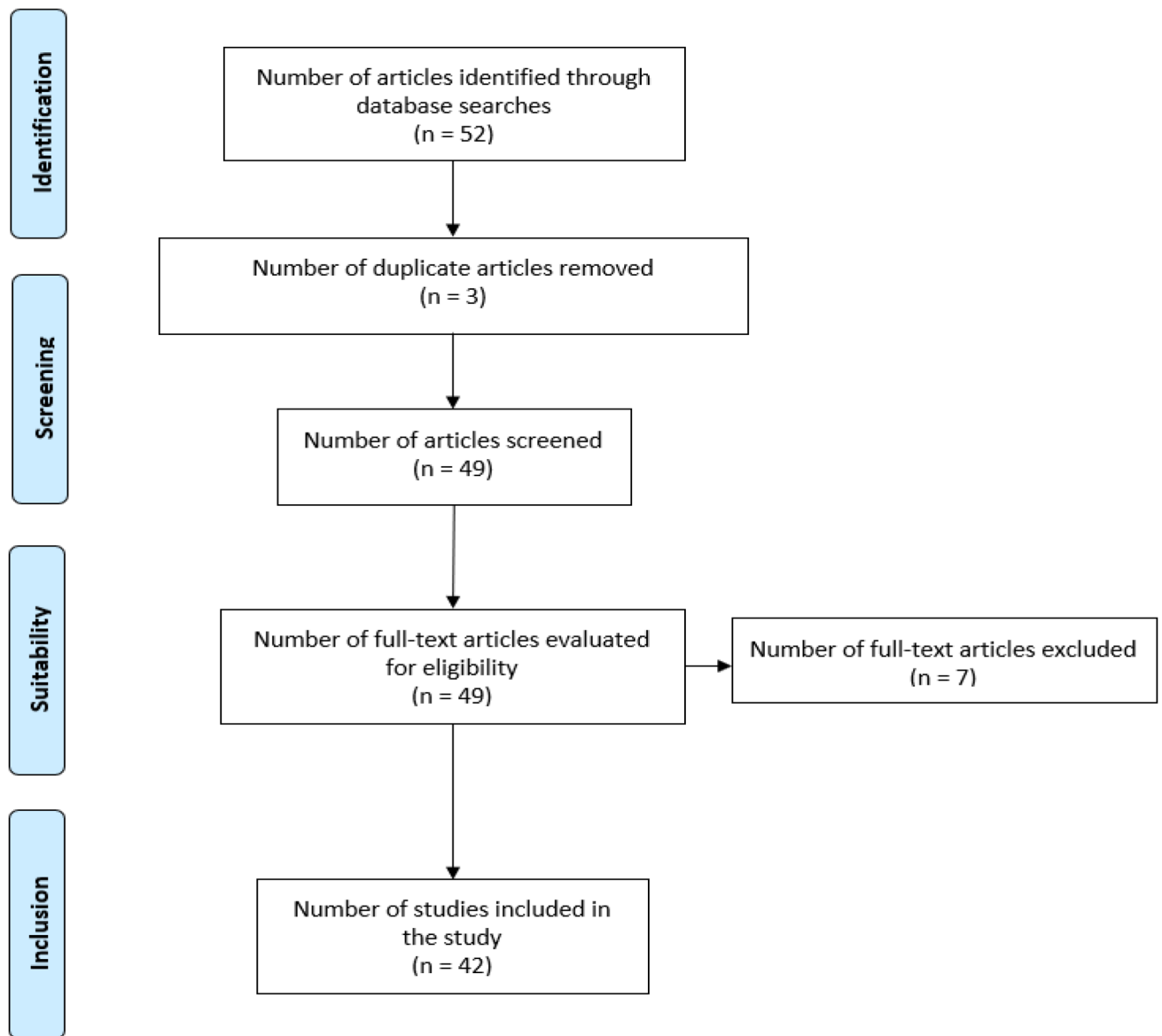
#### **4. Outcomes of research portfolio**

##### **4.1 A refinement of the literature review process**

Atherton (2020b) was a systematic review and preceded an extended version of this as a chapter in (Atherton (2023). In Atherton (2020b), I specified the databases used, the inclusion and exclusion criteria and then used constructivist grounded

theory (Denzin and Lincoln, 2011). The review in Atherton (2023) developed this by applying a theoretical framework to the systematic review - the PRISMA model, which I adapted from White and Delaney (2021), (**Fig D**, pg 50). Together, these reviews helped me communicate a literature review as I would report on an empirical study. The process added clarity and rigour to the overall portfolio. It also made the literature reviews more systematic and focused in Atherton and Pratt (2022) and (Atherton, 2022 a; b).

**Fig D - The Prisma Model (structure adapted from White and Delaney, 2021)**



(n=my data)

## 4.2 Impact and summary

The practitioner book that precipitated this body of research (Atherton, 2018a) was aligned with a renewed interest in the issue of edtech in schools. The book targeted gaps in the research into edtech and pedagogy especially in relation to the Teachers' Standards (DfE, 2011). The ensuing research would continue on this trajectory. As

the opening chapter explored my own experiences of technology in education it was necessary for each chapter of the book to address the author's developing skill set as a teacher educator. The ensuing research would pick up on some of the chapters, notably on Kahoot! and pedagogy, edtech, student teachers' experiences of edtech (paper 2), a teacher educator's identity and social media (paper 3), research methods for helping teacher educators understand their own journey (paper 4), student teachers' experiences of one social media platform (paper 5) and the literature surrounding podcasting and reflective practice (paper 6).

During the period in which the research took place, the Department for Education (DfE) increased their emphasis on the importance of technology in education. In 2019, the DfE published policy documents on edtech, the emphasis was on embedding 'good' use of technology; the intention was purportedly to reduce workload, bring about improvements in outcomes and create a more inclusive educational culture (Department for Education, 2019). There was an emphasis on procurement and access to markets for technology companies and how to overcome 'barriers' to using technology. This technology was supposedly proven to reduce workload, promote inclusion and improve learning (DfE, 2019).

The first lockdown due to Covid-19 occurred less than one year after and this placed greater emphasis on edtech and pedagogy, in addition to the challenges of teaching pupils remotely and assessing pupils who have been unable to take exams. In a similar way to some of the policy literature, policy has tended to view technology and data in an instrumentalist way, as ideologically neutral (Bayne, 2014; Luckin et

al, 2022). I challenge this throughout this portfolio and my rationale may be summarised in Atherton (2023 p2):

‘.....the book will be adopting a critical platform gaze, through which edtech platforms may be viewed less as ideologically neutral but more as socio-technical assemblages that are bringing about change in education (Decuyper, Grimaldi & Landri, 2021, pp. 1–2).’

As if to amplify the need for technology to be a more prominent feature of learning, the new Core Content Framework for Initial Teacher Training (DfE, 2019) did not contain a single reference to technology (Atherton, 2023). The ramifications of this are yet to be confirmed but the literature is arguing that it is predicated on a de-professionalising, retrogressive intent, where the practitioner-as technician is separated from the body of knowledge and effectively disempowered (Hordern & Brooks, 2023).

Essentially, this body of work addresses the following issues with the literature:

- A paucity of practitioner research on edtech in peer-reviewed journals in the context of Secondary Initial Teacher Education in the U.K
- A dominance of small-scale practitioner research situated in the undergraduate context in other continents.
- a paucity of autoethnographic studies into teacher educators’ emerging digital skills

(adapted from Atherton (2023) p192)

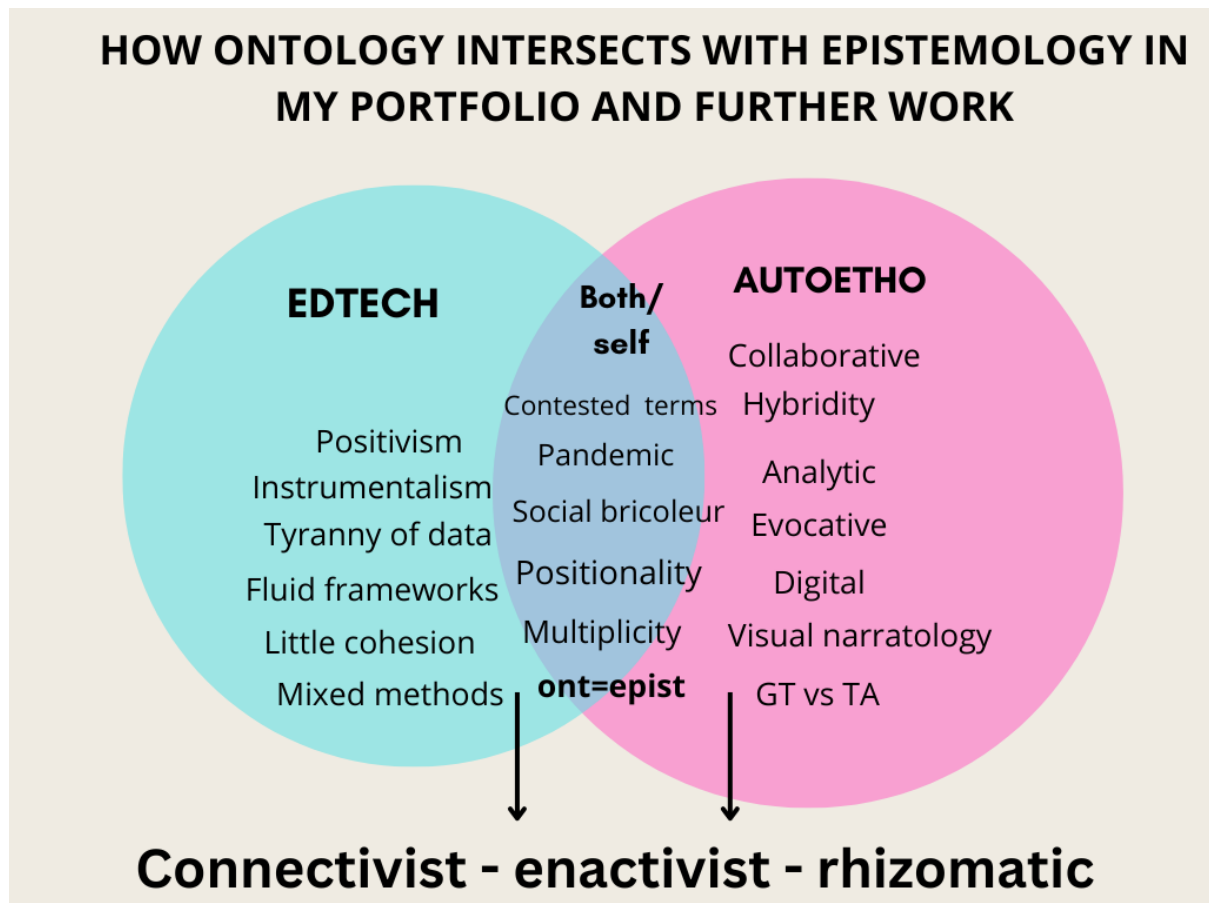
This portfolio, including the de-selected practitioner books, was located in a niche of I.T.E in the U.K. The sample represents a significant proportion of student teachers in the north west of England. The policy documents were large scale but with a selective sample and were sometimes practitioner or instructional papers. An example is an EU-sponsored study published at the end of the process (Luckin et al, 2021) was larger in scope and used a variety of research methods.

### **5. Addressing research questions: intersectionality of connectivism, enactivism and rhizomatic learning**

As my research and reflections on my work developed, I recognised the methodological and epistemological overlap between connectivism, enactivism and rhizomatic learning. **Fig A, C and D** summarise the intersectionality of research questions, methodologies and theoretical frameworks. **Fig D** is a Venn diagram designed to illustrate how the research questions have been explored. In the left circle, I list the issues arising from the research questions in the area of edtech. To the right, the issues are specific to autoethnography. In the centre are the ways in which I have addressed the research questions of both topics through my entangled self (O’Keeffe, 2019; Atherton, 2023).

#### **Fig E - Venn diagram**





- ont=epist means ontology *is* epistemology (Taglietti, Landri & Grimaldi, 2021).
- GT vs TA means grounded theory vs thematic analysis

The Venn diagram in **Fig E** uses a summary of issues that cut across my work on edtech and autoethnography to propose a convergence between ontological and epistemological knowledge (Taglietti, Landri & Grimaldi, 2021). Indeed, this work culminates in the mixed research methods and topics in Atherton (2023). This convergence can be framed through the epistemological paradigms of enactivism, connectivism and rhizomatic learning.

This synthesis statement proposes that enactivism, connectivism and also rhizomatic learning all help contextualise my own residence in the metaphorical *chasm*. In Atherton (2023), I assess the relevance of rhizomatic thinking in the following manner:

*The literature here will be selected in a more promiscuous way, to reflect the multiple entry point to the rhizome. Indeed, this stylistic flexibility echoes Deleuze & Guattari's (1987) contention that the rhizome is less of an extended metaphor and more of an analytical tool (Deleuze and Guattari, 1987; Strom and Martin, 2017).*

*(Atherton, 2023. p 138).*

Instead of languishing in a state of 'epistemological clash' (Li, 2012 p787), my studies recognise the potential epistemological harmonies between enactivism, connectivism and rhizomatic learning. They share many crucial similarities; in all cases they can bridge a chasm between ontology and epistemology. For each framework, knowing is being and doing; ontology becomes epistemology when a complex but harmonious ecology co-constructs knowledge (Li, 2012; Towers et al, 2017). The construction of new knowledge has been the result of a reciprocity of human interaction and cognitive science (Ward et al, 2017). Indeed, in Section 6 and in **Fig F** (pg 66) , I will propose how enactivism, connectivism and rhizomatic learning can be complementary theories that may co-exist as a co-emerging sense-making framework. Indeed, the intersectionality of these theories is the essence and the anchor of the *chasm*, in which I reside (Atherton, 2019; 2023). I will

also summarise the limitations of each framework as I draw conclusions from the research questions.

### **5.1 Research question 1 (RQ1):**

***What are the emerging skills that teacher educators need as they support their students in their use of technology and how do these contribute to the formulation of identities?***

As suggested by the overlapping centre circle in **Fig D**, the discussion of skills that are likely to have a positive impact on outcomes is beset by contested terms and a lack of coherence in the literature. One of the reasons for this is that the literature is truly global in nature; while my own positionality as a teacher educator is located in England, the research that I have reviewed is not dominated by English studies. Viewed through a connectivist lens, this locates the individual's learning within a series of networks, from which they make, then update connections (Boyras and Ocak, 2021). One of the emerging skills of the teacher educator, therefore, is aligned with how children learn, in a culture in which local is global, global is local and knowledge is fluid, not fixed (Siemens, 2005; Atherton, 2018b; 2023). Not only does my own learning mirror that of the pupils my student teachers are teaching, it also reflects the iterative journey of edtech products. This is reflected in Atherton (2023), as I review very recent literature on A.I and educational chatbots. This became even more pertinent when reviewing the literature on virtual reality (VR), artificial intelligence and blockchain (or peer-to-peer, immutable networked transactions along a decentralised chain (Pandey, 2021; Chen et al, 2018; Atherton, 2023). As a

result, a coherent set of relevant skills has been problematic and this has, of course, been further stalled by the pandemic. While the skills, definitions and concepts may be contested or fluid, connectivism offers some form of anchor as an epistemological strategy (Boyras and Ocak, 2021).

**5.2 Research question 2 (RQ 2) *How has the ‘chasm’ been a space of both creative opportunities and challenges in shaping the researcher’s academic identity?***

During the earlier iterations of this synthesis statement, I would view my own positionality as an ongoing attempt to traverse a metaphorical chasm. The answer to the previous question - *What are the emerging skills that teacher educators need as they support their students in their use of technology and how do these contribute to the formulation of identities?* - necessitated *crossing* the chasm. The entanglement of the self in the research began with myself positioned on the periphery, analysing a perceived chasm between how edtech use in schools and Secondary student teachers’ awareness and use of technology (Atherton, 2019; 2023; O’Keeffe, 2019). As the portfolio developed, I proposed that *I*, the researcher, was the bridge over the chasm. By trying to cross the metaphorical bridge, my conclusions from the mixed methods data about Kahoot! (Atherton, 2018b), other edtech platforms and social media (2019; 2022a;b), was often contradictory. This presented a challenge in terms of replicability (Atherton 2023). To address this, I focused more on the lived experience to help me interrogate this identity, in order to bridge the chasm (Clark, 2020; Atherton, 2023). This bridge did not form a route to conclusive generalisations

from the mixed methods data. This bridge, then, would bring me back to where I began, by adopting connectivism (Siemens, 2005; Atherton, 2018a;b; 2019; Atherton, 2023). This circular journey led me to more recent papers about connectivism, for example Downes (2022) and Boyraz and Ocak's (2021) review of learning during the pandemic (Atherton, 2023).

The mixed methods and various edtech topics explored in Atherton (2023), however, led me to view the chasm not as a gap that needed to be bridged but as a space of creative possibility, which I was happy to inhabit. This conclusion is predicated on a re-examination of my own positionality, as a teacher educator who is 'structurally coupled' (Towers et al, 2017p166) with his students, with the teaching and learning environment and my own status as a PHD student. These entanglements help me view my positionality as akin to a river running through a chasm (Siemens, 2005). In this state of flow and fluidity, I may make a contribution to knowledge that may be rich with epistemological possibility. I may also consider my research and academic identity through the lens of the physical, emotional, structural and contextual factors that represent my own entanglement (Towers et al, 2017).

### **5.3 Research question 3 (RQ3): *How can qualitative inquiry help teacher educators construct a coherent identity?***

My autoethnographic work sought to challenge positivist and instrumentalist traditions of social science research through replicable, rigorous qualitative research (Atherton, 2020a; 2022; 2023). These were augmented by data collection methods that were transparent. The rigour and replicability were further enhanced by the use

of constructivist grounded theory and thematic analysis (Atherton, 2023).

#### **5.4 Research question 4 (RQ4): *What emerging paradigms and research methods are attempting to interrogate the edtech space?***

In terms of a research methodology, my use of collaborative autoethnography began in Atherton (2019) and was reiterated in Atherton (2022b; 2023). This was a progression from earlier autoethnographic papers (Atherton, 2020a; 2022b); the intention was to develop further the process of analysing individual stories to explore ontological truths (Roy and Uekusa, 2020; Atherton, 2023). The statement suggests that the reason for the hostility towards social media might be due to its relative newness. The author raises an ontological question, about whether it is possible to answer questions about the nature of social media when the subject is in a state of flux. The metaphor of "shifting sands" is used to emphasise the instability of social media and its impact on our understanding of it (Atherton, 2018a). In terms of the context of my own research, the pandemic has exacerbated feelings of isolation among student teachers and teacher educators alike. This collaborative ethnographic study builds on the use of reflexivity through narrative writing and autoethnography in Atherton (2020c) and Atherton (2020c).

In the conclusion of Atherton (2023), I suggest that recent studies into edtech may be in search of a new set of paradigms for the reasons specified below:

*'...the edtech space, into which I have immersed myself performatively (Clark, 2020), is on shifting sands ontologically, epistemologically and axiologically. This*

*paradigmatic pluralism has led me to adopt an appropriate way to navigate my own positionality: it necessitated a multi hyphenate approach. The term multihyphenate draws from the multiple roles that can be performed in the acting world, hence multiple hyphens.*

(Kimmons & Johnstun, 2019, pp. 639–640, cited in Atherton (2023, p195).

I will propose a new model to crystallise these ideas and make recommendations arising from these points in Section 6.

**Extract 6:**

*Time for you and time for me,  
And time yet for a hundred indecisions,  
And for a hundred visions and revisions,  
Before the taking of a toast and tea.*



*Image made by me on DallE2 Open AI. Search term: 'Human heads on a kitchen table in the style of a Cezanne still life'.*

### **5.5 Refinement of literature and research methods in ongoing research**

One of the outcomes from the portfolio was the completion of Atherton (2023) which adopts a variety of research methods. A brief summary of where the book fits into the trajectory of the portfolio is summarised in **Figs B, C, E and F**. The papers in the portfolio have been narrowed down into four themes, all of which interlink and are developed further in Atherton (2023). The graphic to the left of the diagram in Fig F lists each theme at the top, then the research methods, emerging themes and



limitations below that. To the right, I have specified the theoretical framework (s). In red, I have indicated how the work has been developed in Atherton (2023).

As the portfolio builds and gives way to the second book (Atherton, 2023), this challenge to instrumentalism is applicable to the literature and research into a variety of topics, notably autoethnography, virtual reality, artificial intelligence, social media and blockchain technologies. A key challenge to instrumentalism is the contention that this type of thinking suppresses debates about the power of big tech, social inequalities and the ramifications of political decisions (Bayne, 2014). *Chapter 7: The tip of the Iceberg and waking up to social for edtech events* (Atherton, 2023), uses the following quotation to reinforce this point:

*This shared sense of starting with data often leads to an unnoticed assumption that data are transparent, that information is self-evident, the fundamental stuff of truth itself. If we 're not careful.... our zeal for more and more data can become a faith in their neutrality and autonomy, their objectivity.*

(Gitelman, 2013. P3).

This challenge to instrumentalism continues into other papers and chapters in the book, notably the autoethnographic chapters. This is summarised in **Fig D and E**. Examples of this are Atherton (2022a) and *Chapter 8: What is your edtech journey? Autoethnography and the importance of learning journeys* (Atherton, 2023). In both texts, the focus on the lived experience and the researcher as data challenge epistemological notions of the nature of data. This epistemological challenge is

evaluated in a different way in *Chapter 9 - Blockchain-powered education and other private learning communities - from echo chamber to walled garden* (Atherton, 2023). The review of the literature concluded by recommending a cautious approach to: 'the mass adoption of blockchain technologies and their attendant big data management, legal issues, General Data Protection Regulation (GDPR, 2016) and potential erasure of essential data' (Loukil, Abed and Loukadi, 2021; Atherton, 2023 p189).

On closer examination, I would posit the view that connectivism is a theoretical framework that challenges the epistemological traditions of positivism and instrumentalism (Goldie, 2016). In Atherton (2023), connectivism is referred to as 'a reference point, to illustrate how edtech can create an interconnectedness between users and networks' (Shukie, 2019; Boyraz and Ocak, 2021; Atherton, 2023 p185). This chapter develops from connectivism to stand as a theoretical chapter on rhizomatic learning (Cormier, 2011). I develop this further in the conclusions to Atherton (2023) with more recent literature. Atherton (2023) updates and critiques some of the literature and findings in Atherton (2018b) and examines my initial attraction to connectivism, 'as a way to impose a sense of order from chaos' (Atherton, 2023 p185; Downes, 2022; Shukie, 2019). The chapter summarises the initial scepticism that I had around connectivism. Firstly, connectivism may invite empirical validation through research but it is not the result of empirical data (Goldie, 2016; Downes, 2022; Atherton, 2023). Additionally, connectivism clashes with positivist and empiricist conventions of an education culture beholden to prescriptive learning objectives and linear progress for learners (Baume and Scanlon, 2018, cited in Luckin, 2018; Atherton, 2023). Despite this tension, Chapter 3 in Atherton

(2023) - 'Virtual insanity? Is virtual reality still the future of education?' aligns In counterpoint virtual reality (VR) with connectivist thinking. At the time of writing, VR was less a staple of curricula and more an optional enhancement to deepen engagement and connect virtual experience with concrete knowledge (Siemens, 2006; Donnelly, 2010; Atherton, 2018a; 2023).

This concept is developed further in one of the chapters in Atherton (2023). The extract below from Fuchs (2017) aligns with this statement's critique of the ubiquity of big data:

*Big data analytics' trouble is that it often does not connect statistical and computational research results to a broader analysis of human meanings, interpretations, experiences, attitudes, moral values, ethical dilemmas, uses, contradictions and macro-sociological implications of social media.*

(Fuchs, 2017 p3)

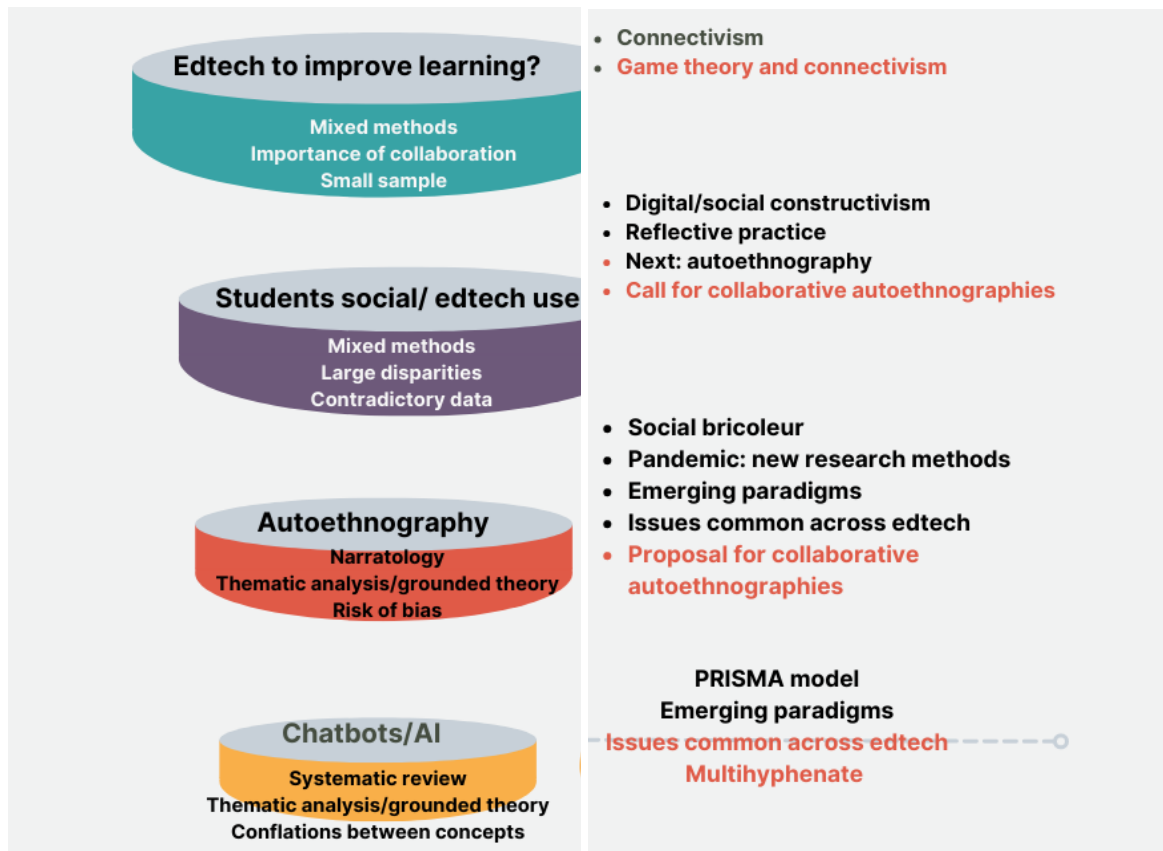
Fuchs (2017) proposes a paradigm shift away from the tyranny of big data to a more critical and realist approach (Atherton, 2018; 2023). The autoethnographic work progresses into locating myself as entangled in the performativity of academia (O'Keeffe, 2019; Atherton, 2023).the impact of edtech. To address this, the emphasis moved in the direction of the subjective lived experiences of practitioners (Luckin and Kent, 2019, Denscombe, 2007; Atherton, 2023). This built on some of the conclusions in my earlier practitioner book (Atherton, 2018a, de-selected). It is this that informed the use of autoethnography for papers 3 and 4 and the pursuit of

collaborative autoethnography for papers 5,6 and 7. Autoethnography continued to be used as a research methodology in Atherton (2023).

This use of grounded theory was continued into Atherton (2023) in a chapter that is a qualitative systematic review (Chong and Reinders, 2020). This chapter deployed constructivist grounded theory (Chong and Reinders, 2021), which helped me acknowledge my own role in the production of meaning. This helped me narrow the focus, minimise redundant data and generate more tentative conclusions (Denzin and Lincoln, 2011; Charmaz, 2014; Chen, 2016; Chong and Reinders, 2020; Atherton, 2023).

One of the outcomes from the portfolio was the publication of Atherton (2023). The book develops the research methods from the portfolio. A summary of the overall trajectory of the research is in **Fig F** below:

**Fig F - Trajectory of research**



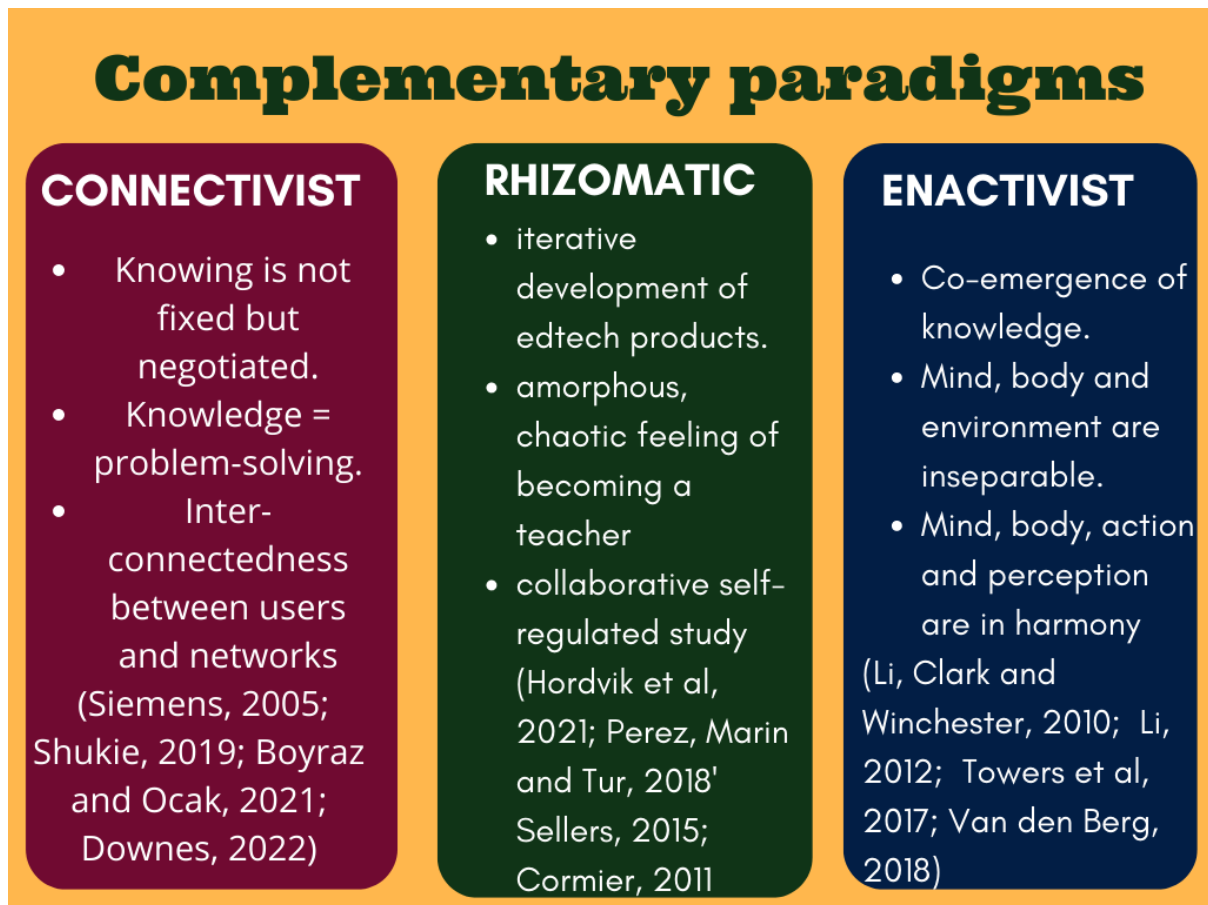
**Fig F** helps sharpen the content of **Fig E**, and illustrates how I have refined the edtech and autoethnographic literature and research methods from the portfolio to Atherton (2023). The unique contribution to knowledge will be discussed in Section 6.

## 6. Impact and recommendations for further study

### 6.1 Complementary paradigms

One of the conclusions from the overall edtech literature is a significant range of paradigmatic pluralism (Atherton, 2023). The complementary paradigms that are visualised in **Fig G** (pg 66) recognise the convergence of research problems and paradigms. One of the advantages of this pluralism is the depth that can be gained from deep reflection on supporting or competing paradigms. This was given an added layer of complexity as the pandemic challenged older paradigms but the literature did not propose a new paradigm (Atherton, 2023). This portfolio's conclusion draws on Deleuze (2006) and Taglietti, Landri & Grimaldi, (2021), who describe the convergence of ontology and epistemology during a transitional period of crisis in which there are more questions than answers and knowledge is on shifting sands (Atherton, 2023 pp194-195).

Fig G: Complementary paradigms



The autoethnographic works challenged my sense of professional self and deconstructed an emerging performative identity, measured quantitatively by social and research metrics (Metcalf, 2019; Cowen, 1996; O’Keeffe, 2029; Atheton, 2023). Indeed, one of the ways to quantify the impact of this portfolio can be measured by the fact my total Research Interest score of 52 is higher than 54% of researchers on ResearchGate. The R.I score also exceeds 66% in educational technology and 69% in Teacher Education. Furthermore, the score is higher than 79% of researchers who first published in 2018, as I did. I also have an H Index of 4, a substantial following (20000 followers) and high engagement levels on LinkedIn, Instagram and Twitter.

If these quantitative metrics have value in terms of research impact, this begs the question whether I am performing my own positionality. Is this about *who I am, or what I am being?* (O'Keeffe, 2019)? Or do I use the process of PHD by Published Works creatively, as an ongoing reflection tool, whose ontological and epistemological realities are provisional, not conclusive? (Taglietti, Landri & Grimaldi, 2021; Atherton, 2023 p195).

## **6.2 Suggested further research**

Atherton, 2023, effectively maps out a 3 year research plan. The book will be a development from my previous work and the ensuing papers will follow the book. The chapters that I would like to develop into papers for high quality journals are:

1. Collaborative autoethnography as a reflection tool for teacher educators.
2. Enactivist reflection on the English curriculum in teacher education
3. Podcasting as research data
4. Narrative review of podcasting

I have started collecting data in the form of audio diaries for the first project. The focus is on student teachers of English and they have been asked to use Vocaroo - an audio recording website - to reflect on the development of their knowledge of the English curriculum. The thematic analysis of the data will be carried out in collaboration with one of the Readers from the LJMU English department.



The conclusion to Atherton (2023), proposes an openness to multiple paradigms while still being mindful of potential contradictions. Its rigour resides in its revision of plural research methods and approaches to reviewing literature, most notably in prioritising literature post-2018, to reflect the distance travelled since the inception of the portfolio (Smith, 2015).

Its originality arises from proposing a model to situate the portfolio as a whole in the context of Initial Teacher Education and through the intersecting lenses of enactivism, connectivism and rhizomatic learning. This fusion of underlying mechanisms provides a revision of connectivism in the context of the autoethnographic data collection of multimodal texts. This is a reframing of Haskell, Linds and Ippolito's (2002) notion of the groundlessness that arises from *embodied action* (p1).

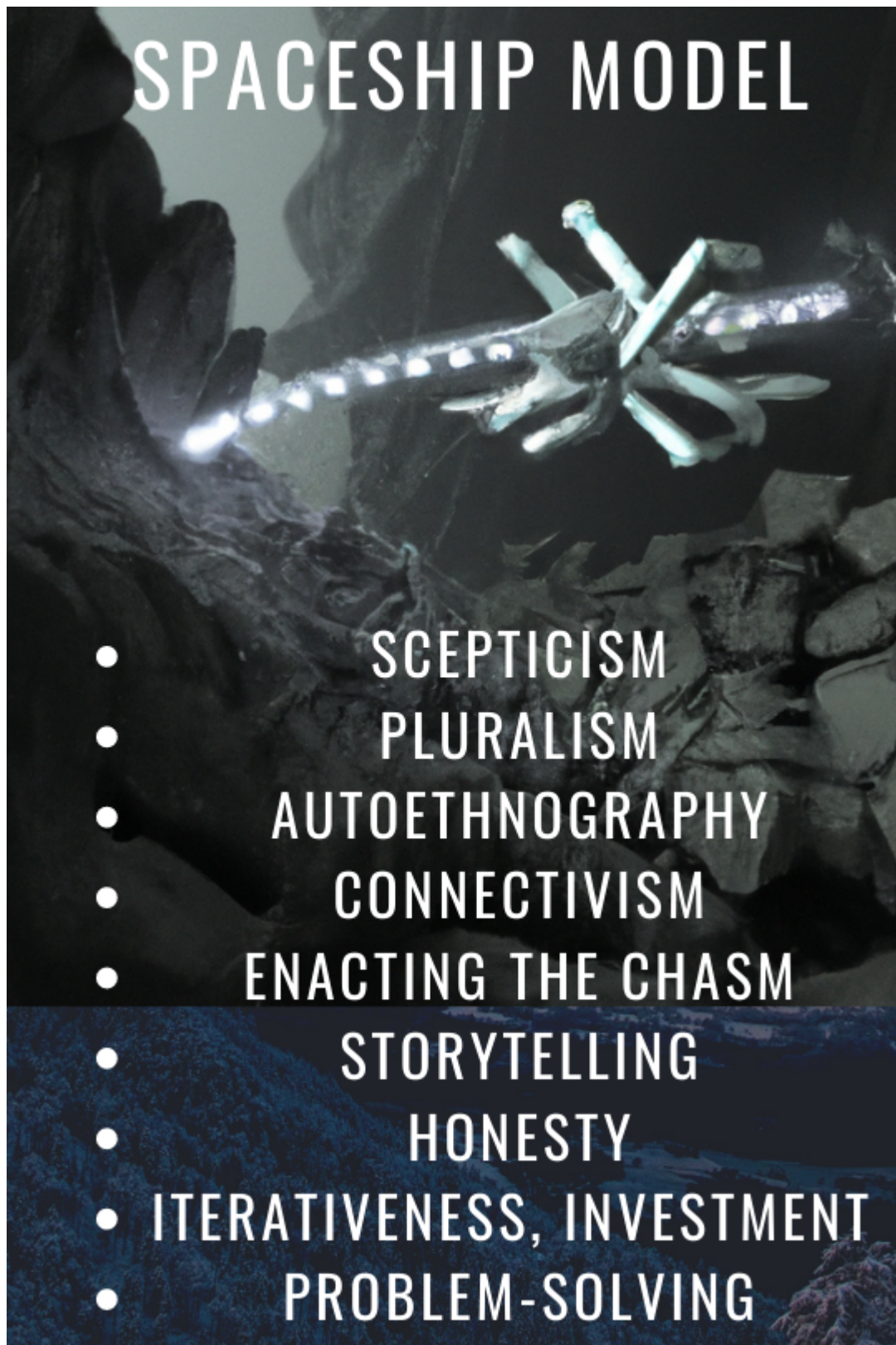
The unique contribution towards knowledge from this portfolio is summarised via a model that I created. The SPACESHIP model draws on Kimmons and Johnstun (2019) and is discussed in depth in section 6.3.

### **6.3 Addressing the portfolio's limitations and my unique contribution**

**Fig. F** represents the essence of the originality of the portfolio. In keeping with the notion of connectivism, what lies inside, around and beneath this chasm is in a delicious state of flux (Atherton, 2023). This originality is achieved partly by the positioning of myself as peering into the chasm throughout, acknowledging my

positionality as grounded within a synthesised ontological and epistemological ecosystem. The portfolio's originality, however, has its limitations by the conclusion chapter in Atherton (2023). To address this, I adapted Kimmons and Johnstun's (2019) notion of the multihyphenate's approach to working with several research paradigms. I have proposed a new model - the SPACESHIP Model (**Fig H**, pg 72), to demonstrate my research journey and conclusions so far. If this metaphorical spacecraft was approaching in the conclusion of Atherton (2023), Fig H may help it land before its next voyage.

Fig H - The Spaceship model



**Scepticism:** I approach competing paradigms with healthy scepticism, acknowledging the necessary distinctions that arise between them. I have approached my methodologies and data analysis in this way (entire portfolio).

**Pluralism:** As a multihyphenate enactivist, I am a pluralist who is willing to work in multiple paradigms without privileging one over another. This has enabled me to explore intersectionalities (Atherton, 2023).

**Autoethnography:** I use the self as data in various forms, for example narrative writing and digital art (Atherton, 2020a;b;2022; 2023). Realist ethnography accompanies the entire portfolio.

**Connectivism:** My journey as a multihyphenate is slow, deep and fluid, as problems and paradigms are deeply entwined with one another. I do not engage with a paradigm on a whim (Atherton, 2018a; b; 2019; 2023; Kimmons and Johnstun, 2019).

**Enactivism:** I recognise the incommensurability of competing paradigms and approach them with a healthy scepticism. My research journey has been characterised by embodied action and an entanglement of the self in the creation of meaning ( Li, Clark and Winchester, 2010); I have been enacting the chasm. This has augmented any positivist or cognitivist elements of my research by emphasising that its philosophy of nature is arrived at via a consideration of various paradigms (Meyer & Brancazio, 2022; Atherton, 2023).

**Storytelling:** I use storytelling in various forms to discuss the problem-solving skills required to use technology effectively (Atherton, 2018a; b; 2019; 2020a; Atherton & Pratt, 2022, Atherton, 2023).

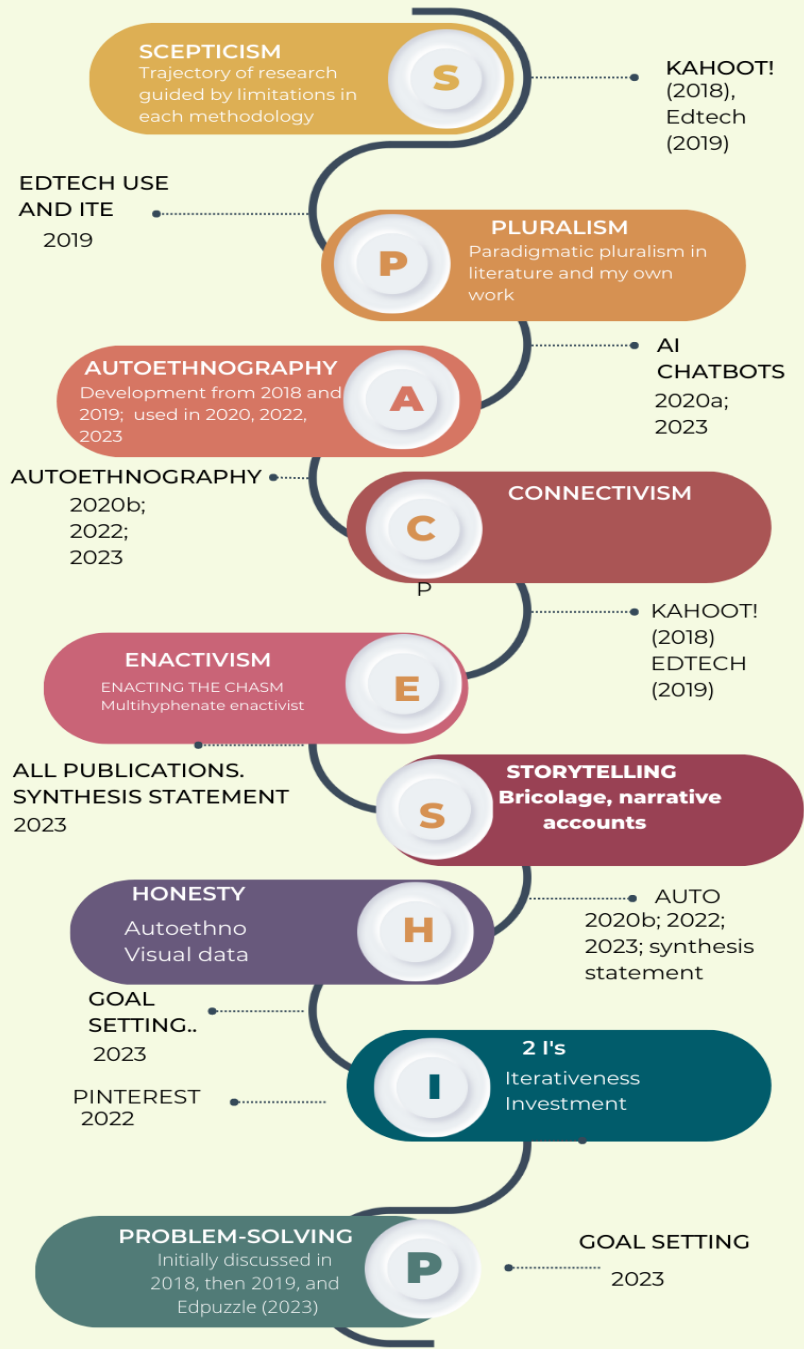
**Honesty:** I engage in honest multiparadigmatic work, building upon and honouring paradigmatic assumptions and contradictions (Atherton, 2020a;b;2022; 2023).

**Iterativeness & investment :** My reflections have self-consciously recognised their iterative nature. I deeply invest in and acknowledge the paradigm being used. I acknowledge the necessary distinctions that arise between irreconcilable paradigms (entire portfolio).

**Problem-solving:** My journey as a multihyphenate necessitates problem-solving, and I approach each problem iteratively and with an investment in multiple paradigms (synthesis statement).

This summary - a development from the draft model in **Fig H**, is visualised in **Fig I** below, pg75):

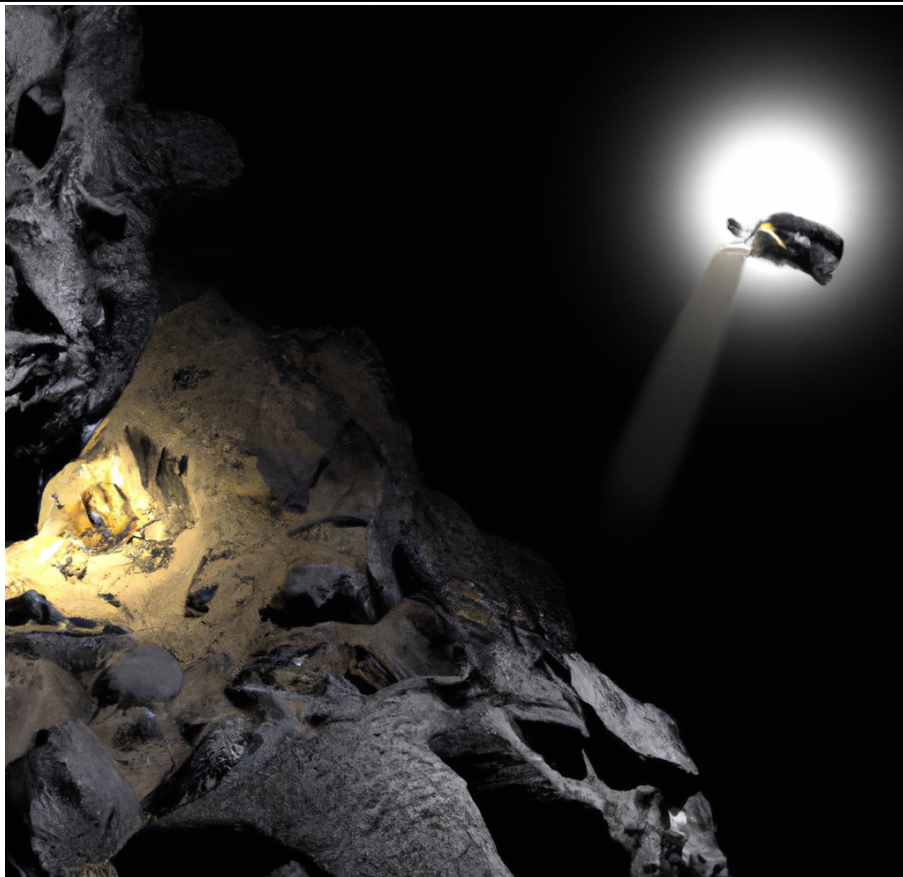
# SPACESHIP MODEL



Groundlessness is an exciting "space" where possibility arises for how we think about knowledge, cognition, and experience. I argued in Section 2 that the global and fractured nature of the literature has made it hard to identify gaps. This portfolio's original contribution targets some of those gaps. The space that I carve throughout Atherton (2023) is a homecoming, a temporary grounding, where I occupy a position as a multihyphenate enactivist.

### Extract 7

We have lingered in the chambers of the sea  
By sea-girls wreathed with seaweed red and brown  
Till human voices wake us, and we drown.



*Image made by me on DallE2 Open AI. Search term: Spaceship, chasm*

Unlike Eliot's Prufrock, whose meandering journey leads him to a concluding image that expresses a tension between the creative process and the exterior world, my concluding SPACESHIP model suggests that I am occupying a space of self-possession and homecoming. Eliot switches from the first person singular (I) to the first person plural (we) in the final stanza. Like Prufrock's, could *our* 'drowning' be a release from my original notion of a chasm, with its tensions, contradictions, alienation and fragmentation (Haba, 1977)?

Could we all be multihyphenate enactivists now?

In terms of recommendations for practice I offer some ideas that teacher educators may wish to adapt. When embarking on research, teacher educators may consider approaching new paradigms with a healthy but rigorous scepticism. They may wish to embrace the iterative nature of research with patience, transparency, honesty and ethical responsibility. That transparency may manifest itself through a reflexive, fearless social media presence or through one of their existing or emerging creative passions. They should not be afraid of drawing on personal experiences to create narrative writing, physical or digital art to provide authenticity and embody how they are intertwined with their positionality, their surroundings, their environment - their fluid sense of self. They could pull back the curtain, let the reader in to their process, maybe confront the reader. They could be open to how they see their readers. My reflexivity enabled me to view the reader as a fellow traveller, a conspirator, a critical friend, with whom I would feel vicariously and even confront my judgements alongside their own.



So, like Eliot's Prufrock, Let us go then, you and I/When the evening is spread out against the sky/Like a patient etherised upon a table.

Maybe I'll see you in the chasm. You would like it there: it is therapeutic and rich in sense-making and possibility.

It is home.

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## Appendix A

### **Also not selected - Externally published 1000 word blogs between 2019 and 2023**

- 1) Atherton, P., 2020. Fewer resources, more intelligent data — can schools do more with less?. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/communityblogs/intelligent-data-schools>>.
- 2) Atherton, P., 2020. The digital divide and other big questions - education and COVID-19. [Blog] *Bromcom*, Available at: <https://www.bromcom.com/blogs/CommunityBlogs/digital-divide-education>
- 3) Atherton, P., 2020. Edtech, Covid-19 and the school community. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/edtech-covid19-school>>.
- 4) Atherton, P., 2020. Schools and Covid-19 — What the Dickens is going on?. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/covid19-schools>>.
- 5) Atherton, P., 2020. Has technology helped Primary Schools face the challenges of Covid-19?. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/covid19-challenge-primary-schools>>
- 6) Atherton, P., 2020. How Primary School data can track progress to keep kids on track Picture the scene. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/primary-school-progress-t-racker>>.
- 7) Atherton, P., 2020. Top ten tips: how better data can improve your school. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/tips-improve-school>>.
- 8) Atherton, P., 2020. Data, schools and Covid-19. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/communityblogs/data-schools-covid19>>.
- 9) Atherton, P., 2020. How one Multi Academy Trust made the switch to MIS to enhance teaching and learning [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/mat-mis>>.
- 10) Atherton, P., 2020. Bolt on or belt up - what can school data learn from the car industry?. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/school-data-example>>.
- 11) Atherton, P., 2020. Data with the X Factor? Let's talk about Vision X. [Blog] *Bromcom*, Available at: <<https://www.bromcom.com/blogs/CommunityBlogs/visionx-data>>.

- 12) Atherton, P., 2020. Four tech tips for teachers to impress your colleagues. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/four-tech-tips-for-teachers-to-impress-our-colleagues/>>.
- 13) Atherton, P., 2020. 5 time-saving tech solutions for new teachers. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/5-time-saving-tech-solutions-for-new-teachers-2/>>
- 14) Atherton, P., 2020. 10 essential edtech ideas to share with your team. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/10-essential-edtech-ideas-to-share-with-your-team/>>
- 15) Atherton, P., 2020. 4 ways to use virtual reality (V.R) in your teaching. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/4-ways-to-use-virtual-reality-v-r-in-your-teaching/>>
- Atherton, P., 2020. 5 ways that technology impacts education. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/5-ways-that-technology-impacts-education/>>
- 16) Atherton, P., 2020. What is Pedagogy and why should we care? [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/what-is-pedagogy-and-why-should-we-care/>>
- 17) Atherton, P., 2020. 5 educational apps that will help you save time. [Blog] *Opogo Community*, Available at: <<https://community.opogo.com/article/5-educational-apps-that-will-help-you-save-time/>>

### Edtech Innovators podcast

This collection of over 60 podcast episodes, conceived of, designed, presented and edited by me, make a substantial contribution to knowledge in the edtech and education space. The podcast will continue to develop the autoethnographic papers and chapters in the coming months.

<https://podcasts.apple.com/us/podcast/edtech-innovators/id1496165384>

### Appendix B: Curriculum Vitae

<b>Education</b>
<b>2023</b> - PHD by Published Works
<b>2019</b> - Fellow of Higher Education Academy

**2015-2017**

Master's Degree in Advanced Educational Practice, Liverpool John Moores University

**1992-1993**

PGCE, Keele University:  
English Secondary and F.E.

**1988–1991**

BA Hons, English Liverpool John Moores University  
Degree class 2.1.

**External positions**

Bromcom -Blogger on edtech (from Sept 2019)

Opogo – External Consultant and Community Expert (from Jan 2019)

This role involves directing Teachgrowth - Opogo's NQT Support Programme; creating blogs, conducting webinars, creating videos for online courses and providing consultancy on education.

UCL IoE (Jan 2018). Consultancy work on their blended learning programme

**Membership of academic societies**

Teaching and Learning Fellow - CLT (from Feb 2019)

**Speaking invitations**

Festival of Education 2017, *Etech and pedagogy*

Solstice Conference, Edge Hill University (June 2018). Entitled, *Taming the beast! Social media and pedagogy*

T.E.A.N Conference, Birmingham (May 2018). Entitled, *Taming the beast! Social media and pedagogy*

NQT Conference, LJMU. (May 2019). Entitled, *Challenges facing new teachers.*

Solstice Conference, Edge Hill University (June 2019). Entitled, *Social media tools and data – the tip of the iceberg you can't ignore*

ACRE Conference 2019, *Entitled, How I became an edtech double agent*

Eassessment Conference, April 2020. Keynote speech. My edtech journey.

INTED 2020, Entitled, March of the Robots? Artificial intelligence (ai) is part of the mainstream in uk education. but why should anyone care?

TEAN Conference 2021. Entitled, *My social autoethnography*

INTED 2022, Entitled *From reflective models towards collaborative autoethnography: how can social media be used as a pedagogic tool for secondary student teachers?*

June 2022 Man Met conference: Belonging in a Digital World – Enhancing the student journey. *What is your edtech journey? Autoethnography and the importance of learning journeys.*

March 2023 Multiverse Conference ‘*Chat GPT and Edtech*’

May 2023 TEAN Conference

June 2023 FED Conference - panel discussion

July 2023 Edulearn Conference (2 papers).

## Appendix C

### Statement of Contribution

Andrea Pratt (a.pratt@ljmu.ac.uk) Senior Lecturer, Liverpool John Moores University, UK.

You are being asked to complete this statement of confirmation to support Pete Atherton’s application for PhD by Published Work, at Liverpool John Moores University. The paper below, co-authored with you, will contribute to his portfolio of peer reviewed articles, chapters and conference proceedings.

#### Confirmation

I confirm that Pete Atherton is an author of the article listed in the table below, and that the percentage contribution stated for the article is an accurate assessment of his involvement.

Article	Contribution

Atherton, P. and Pratt, A. (2022) From reflective models towards collaborative autoethnography. How can social media be used as a pedagogic tool for Secondary student teachers? 14th International Conference on Education and New Learning Technologies. 07 Mar 2022 - 08 Mar 2022. EDULEARN Proceedings. IATED. Mar. 2022. DOI: 10.21125/inted.2022	80%
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Please enter your personal details below<sup>[1]</sup>, and return this form via email to p.f.atherton@ljmu.ac.uk from the email account above, as confirmation of your agreement. Many thanks.

**Full Name (with salutation): Mrs Andrea Pratt**

**Date: 17/05/2023**



**Signature:**

**Thank you!**

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[1] Note: this document is designed to be completed electronically and you can insert a scan or photograph of your signature – please save your completed form as a PDF file and return it to Pete. If you would like to be able to print a copy to physically sign, please contact Pete on the email address above.