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An Autoethnography Of Becoming An Innovative Engineering Academic: Punk, Pirate And Guerilla Pedagogy

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AN AUTOETHNOGRAPHY OF BECOMING AN INNOVATIVE ENGINEERING ACADEMIC: PUNK, PIRATE AND GUERILLA PEDAGOGY

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ABSTRACT

In this Autoethnography (AE) I consider, "becoming" the Most Innovative Teacher (2018) at my university. My identity as a university teacher, my epistemic beliefs, and my choice of vocational pedagogical techniques, have been influenced by my working-class background. No school qualifications, becoming the wrong sort of engineer (plumbing), and a twenty-three-year journey to a doctoral qualification. In 2013 my employer declared that I did not have a 'significant responsibility for research' (SRR). I was transferred to a teaching only contract as a punitive measure for not fulfilling my employers research expectations. My lateral migration to a teaching post was the catalyst for my re-engagement with pedagogy. I became aware that my teaching & learning practice had theoretical (constructivist) foundations. Engaging in scholarship, I read publications on teaching like a pirate, guerrilla teaching, and being a punk educator. It became clear that I had taken similar risks, to do engineering education differently. In this paper I will examine what motives I had for going "off-piste" and, whether my practice truly constitutes "innovative" engineering pedagogy. I conclude with a caveat on the research methodology (autoethnography) employed.

1 INTRODUCTION

1.1 Positionality

I work in the construction industry. Whilst I may no longer be a 'construction worker', my academic identity, and my ontological and epistemic beliefs, have an indelible link to my post-school employment (1980-1984) as an apprentice plumbing & heating engineer. Through reflecting on these early work years in adult life I now understand why I am drawn to Constructivist pedagogies. As an apprentice, I learned 'on the

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job', and, at college. A symbiotic relationship espoused by Ryle (1945) as the practical 'knowing how', and the theoretical 'knowing that'. My apprenticeship experience has put a 'vocational' stamp on my approach to teaching and learning in Higher Education (HE).

The purpose of this paper is to 'go public' and to offer a transparent account of why, and how I have made changes to my teaching practice. The catalyst for my reflections being an award (most innovative university teacher, Student Union Teaching Excellence Awards, 2018 -TEAs) at Strathclyde. What 'innovative pedagogy' had I deployed? Had my students gained an advanced understanding of what constitutes innovative pedagogy? Did the evaluation panel have rigorous criteria for defining and evaluating innovative practice? I think not! As Averill and Major (2020) have argued, 'innovative pedagogy' is a term that is challenging to interpret.

2 METHODOLOGY

2.1 Autoethnography

AE is qualitative research methodology that places the author as an insider participant observer of their own practice. Ellis, Adams & Bochner (2011) note that AE researchers 'use tenets of autobiography and ethnography to do and write autoethnography. Thus, as a method, autoethnography is both process and product'. AE researchers revisit their practice through epiphanies / life events and use selective judgement to narrate episodes that are salient to the story. Given the recent disturbance to academia (coronavirus pandemic) Waller and Prosser (2023) have called for a greater use of AE as a means to explore the lives of academics.

In engineering education, the use of AE is sparse, albeit with a recent spike (i.e., Chambers et al., 2021; Secules et al., 2021; Xu, 2023). One study (Martin, Bombaerts, & Johri, 2021) published by SEFI. Of particular relevance to my own cultural identity, AE has been employed by former tradesmen in doctoral research (Moffat, 2018 (car mechanic); Crascall, 2021 (carpenter & joiner) to chart their own transition from blue-collar to white-collar academics. Through consultation with AE research on academic identities in HE (Trahar,2103; Kumar, 2021) and I believe that my approach combines an evocative (confessional) and analytical (objective) style of AE.

3 FOUNDATIONS OF KNOWLEDGE

3.1 A Plumber and an Anaesthetist

My exit from secondary school in December 1979, with no qualifications, was a case of social engineering. Whilst my brother (anaesthetist) was preparing to graduate from the same school as Dux, and study medicine at Edinburgh University, I found myself enrolled on a pre-apprentice, construction trades 'link- course' at my local college. Rose (2014) refers to similar practice in the USA whereby 'neck down', non-cognitive, non-academic, manually minded students, are streamlined into vocational, physical work pathways. In the UK, Claxton (2015, 270) notes that- 'despite repeated attempts to redress the balance, 'vocational' or 'technical' education is still widely seen as what you do if you are not 'bright enough' to do well at English, Maths or Science.'

3.2 A Love for Learning

The pre-apprentice course led to an apprenticeship as a plumber (1980-1984) and a further two years practising my trade. Unknown to me at the time, this was my introduction to experiential learning within a Community of Practice (Wenger, 1998); reflecting on, an in practice (Schon, 1983), and critical, a love for learning that was absent in my schooling. Over the piece (1984-86) I continued part- time day studies at college (unusual for trades) and secured an Ordinary National Certificate (ONC) in Building Studies. On symbolism, I recall a pride in purchasing a scaled ruler for the course, not quite a highbrow log scale ruler, but something with numerical significance that demonstrated a 'neck-up' learning opportunity!

3.3 Ballcocks and Bernoulli

It was not just ballcocks, boilers and blocked drains that formed my identity. I have taken some kudos from knowing that my craft knowledge on water and gas pipe sizing had scientific origins (Bernoulli's Theorem). Inductive learning oiled my cognition, and again, unknown to me at the time, was my introduction to learner agency, learning how to learn (metacognition) and, heutagogy- self determined learning (Hase & Kenyon,2013).

In 1986 I was presented with an opportunity to take on a temporary role as a plumbing lecturer at Perth college. Serendipity played a part in my first full-time appointment (1987-1988) at the Borders college (I replaced the successful candidate who was homesick after two months!). This employer blocked my request for further academic progress, so I embarked on a new lecturing job (1988-1992) at a college in England. During this period, I solidified my disciplinary knowledge through securing a Higher National Certificate (HNC Building) and a teaching qualification (Certificate in Education).

3.4 Follow Your Learning Heart- Not the Money

By 1992 I had grown restless and my HNC provided access to full time study- BEng (Hons) Building Engineering & Management degree in Edinburgh. I graduated 1st class with a university medal and continued to study MSc Construction Management, graduating 1996. During the summer vacations I went back 'on the tools' and between 1994-1996 I also undertook part-time work teaching plumbing at Perth college, in parallel with my studies. On completion of my MSc, I secured part time teaching at Robert Gordon University (2 days); 1 day at Fife College, and 1 day at Borders College. I had become a jobbing academic, tramping for work. By spring 1997 I had secured a full-time lecturing post at Robert Gordon University and enquired about part-time doctoral study, but I was turned down. Not to be discouraged I accepted a Research Assistant (RA) post and funded doctoral study at the University of Strathclyde, starting in January 1988. I recall my head of department at Robert Gordon asking- "surely you are not going to take a £10,000 pay cut to take up the RA post?" In October 1999 I secured a lecturing post at Strathclyde and completed my thesis in 2003. This rounded off a twenty-three-year learning journey (Pre-Apprentice Certificate-City & Guilds-ONC-HNC-BEng (Hons)- MSc- PhD). For my reward my annual salary was lower that what it would have been had I stayed in-post as a college plumbing lecturer!

4 I Fought the Research Excellence Framework (REF)

In the UK, the REF gives added emphasis to the maxim of 'publish or perish'. In 2013 my university declared that I did not have a 'significant responsibility for research' (SRR) and I was transferred from a lecturing post to a 'teaching fellow' category. Most UK universities have played this game, to maximise their income stream from the REF exercise. During the 2013-2015 period I developed a vitriol for my university, and a metrics culture instilled by the REF. This period allowed me to construct an identity of 'who I was not', as much as 'who I would become'. If my institution was not walking the talk on the Scholarship of Teaching and Learning (SoTl), then I would. Enrolling on a PG Certificate Learning and Teaching in HE course was a start, engaging in engineering education research followed. I embarked on changing my teaching an assessment practice, becoming more 'guide on the side', to encourage student agency. Over the piece I have taken comfort in the words of a former ICE President- 'it is hardly an overstatement to say that the soul and spirit of education is that habit of mind which remains when a student has completely forgotten everything he has ever been taught' (Inglis, 1941,3).

5 Pirate, Punk, Guerrilla: Cosplay or Constructivist Pedagogy by Another Name?

Over the piece I gained confidence in my epistemic believes through reading works by like-minded scholars. Claxton and Lucas (2015) talk of replacing the school exam factories with curiosity-based learning. Similarly, Calman (2019), a former vice-chancellor at Durham university- 'universities are not meant to be degree factories' (p139) and a former vice-chancellor of my own university (Sir Graham Hills)- 'Universities are Socratic by conformity. Dissent is their life blood. No one worthwhile joins a university to be told what to do' (Hills and Lingard, 2004, 224). I found publications on punk, guerrilla, and pirate pedagogy that bolstered my confidence in declaring that I had become an advocate of constructivist pedagogy.

5.1 Punk

In '*Being punk in higher education: subcultural strategies for academic practice*' Parkinson (2017) provides an analysis of interviews with five HE teachers (humanities) who self-identify as punks, seeking to uncover their punk and academic identities. He adds his own perspective – 'I have always identified with punk practices, ethics and culture, all of which are woven into my lifestyle and worldview' (148). Whilst 'specific examples of applying punk practices through pedagogy were relatively sparse' Parkinson's analysis led to three broad themes related to the participants application of punk in their teaching. (1) Performativity-Issues related to resisting the status quo through individual and collective actions (2) Autodidactic and amateurism-whereby participants sough to encourage students to take responsibility for their own learning, to resist the techno-rational and banking models of higher education. Through providing students with agency to engage in self-directed learning (3) Experience and praxis-an emphasis on valuing students' prior learning and promoting experiential learning and reflective practices. Parkinson concluded that the interviewees did show aspects of 'reactionary disposition' and that they had used a 'grand punk narrative' as 'a mythological tool, encapsulating and ennobling their ethical frameworks and validating their responses to the pressures of academic life in a troublesome higher education climate (156).

5.2 Guerrilla

Guerrilla teaching (Lear, 2015) is a call to arms for primary schoolteachers to embrace their inner oddball, to be creative in their pedagogy, model curiosity, and bring a joy of learning into the classroom. Lear has a healthy disrespect for Government (Ofsted) interventions in UK schools and the associated collateral damage associated with the tyranny of metrics and league tables (teaching to the test). My attraction to going guerrilla is based on my own practice of 'just do it', to take risks and to try something different in my learning and assessment practice. Lear refers to his preparation in the classroom before his pupils arrive: 'just before I open the door, the music will go on. Three tracks (the same ones every morning) that make me smile, or-on a really good day-dance '(30). He explains the need for teachers to radiate happiness and optimism- 'thanks to my morning songs, even if I'm tired and fed up, there's always a smile on my face as the children come in' (p.36).

5.3 Pirate

Burgess (2012) a schoolteacher in the USA offers guidance for 'mavericks and renegades who are willing to use unorthodox tactics to spark and kindle the flame of creativity and imagination in the minds of the young' (p.xii). In his book -*Teach Like a Pirate,* he encourages educators to adopt the spirit of pirate mythology, to be bold, take risks and adopt creative practice. In -*Kill your PowerPoints and teach like a pirate,* Arvanitakis (2012) explains his reason for adopting unconventional inductive teaching methods (i.e., flashmob, body percussion) before introducing theoretical concepts in his first-year classroom. His approach is based on affording student's agency and encouraging citizenship through the use of contemporary and relevant case studies. Law (2013) teaches *Building Services Like a Pirate* to his fourth-year architects. He employs music and rhythm to teach space planning in buildings and with refence to the location of toilets (blocked and leaking) developed a 'Sewer Rap' to emphasise that 'shit happens'. In an exercise to teach building codes (fire egress and firefighting requirements) he arranged for Tasmanian Fire Service to disarm the alarm system and fumigated the lecture theatre with a disco fog machine! Law's dramatic approach is reminiscent of Estes (2007) *Shock and Awe in the Civil Engineering Classroom*.

6.0 Innovative Pedagogy?

In this section I provide a synopsis of practice that have I introduced in a first-year civil engineering module (Civil Engineering & the Environment). Expanded case studies (*) with student feedback can be found on a University of Strathclyde (2023) platform- Sharing Practice in Effective Learning and Teaching (SPELT). Several interventions predate my reading of Sambell, et-al (2012) *Assessment for Learning* (Afl), yet all have elements of Afl. As Brookfield (2017, 171) has noted, 'reading educational literature can help us investigate the hunches, instincts, and tacit knowledge that shape our pedagogy'. Several interventions introduced 'playful learning' (collage, rich picture, newspaper front cover). I did not undertake a risk analysis, consider failure, or worry about what my colleagues, or my students would think. It is reassuring to find other 'oddball academics' engaged in similar practice in the engineering classroom (Willis, 2009). However, James and Brookfield (2014) warn that educators who employ playful learning should guard against accusations of 'edutainment'. Moreover, Lanagan (2011) posits, 'is it [edutainment] a dirty word

whispered in contempt of traditional approaches that implies a dumbing-down of content, whilst glamorising the superficial?' (1).

6.1 Industry Magazine Collage Coursework 2008-2010

To demonstrate the breadth and dept of civil engineering practice I used industry magazines (*Construction News / New Civil Engineer*). The magazines were used to inform an individual written report, and in groupwork cut and collage sessions, to promote fun, foster creativity and reinforce the useful learning from their reading. I contacted the editors of both publications, and it was agreed that the groups with the best collages (voted on my industry guests) would receive one-year subscriptions (Construction News, 2009, Oliver, 2010). Brookfield (2013) has suggested that using collage with students can reduce their fear of engaging in art-based exercises.

6.2 National Geographic*

I sought to introduce my students to civil engineering through a global lens (globalization, ethics, nature, environmental impact, people, and planet). I distributed recent editions of *National Geographic* (NG) and tasked my students to find stories that they considered relevant to their discipline. The results from a pilot study, and a content analysis of a number of editions from over a decade revealed that NG regularly carries themes directly concerning the impact of civil engineering in society (Murray & Ross, 2014).

6.3 Newspaper Front Page Coursework*

Students were tasked with finding stories about civil engineering practice in local and national newspapers. To aid a liberal education through the setting of civil engineering within the social as well as technological environment. The groupwork task involved students preparing their own front page for a civil engineering newspaper and they were encouraged to be playful and humorous in the text and graphical images used to convey their new knowledge. I arranged for colleagues from another department (journalism) to vote on the best front page and the authors were awarded a book prize.

6.4 I'm the Student ICE President Address Coursework 2009-2019*

In this coursework I adopt Sir Isaac Newton's 17th century dictum – *'if I have seen further, it is by standing on ye shoulders of giants'.* I assembled a folder with the inaugural addresses of the ICE presidents (1820 onward) as they constitute a living history that charts the scientific and technological innovations in civil engineering. Students were required to consult six addresses (two from each century) and use these to aid their own address. Reference to contemporary issues and foresight towards 2050 were expected. The top five graded students would present an abridged version of their address to the next 1st year cohort and these students would vote on who would be the student ICE President. The winners received an industry sponsored (BAM Nuttall) trip to the ICE HQ in London and a site visit to a large project such as Crossrail / Thames Tideway, (Murray and Tennant, 2016).

6.5 BBC Reporting Scotland Coursework 2016-2019*

I used my university Planet eStream facility to record weekday BBC Reporting Scotland (6.30-7.00pm) programmes. Where issues relating to civil engineering were

present these editions were saved and logged with a title and an indication of the stream slot. On occasions, one broadcast could have up to three topics of interest (i.e., renewable energy; infrastructure projects; bicentenary of a civil engineering structure). Students were required to select four streams to view and to complete a table with details about what they considered the theme / subthemes of the story. In addition to make a judgement about how news uses 'frames' (conflict, human, economic, morality, responsibility) to convey certain aspects of a perceived reality.

6.6 Rich Picture Coursework 2019-2023*

Since 2010 I have recorded (Plant eStream) a variety of television and radio broadcasts that have relevance for the civil engineering profession. My portfolio includes biographies of civil engineers (i.e., Telford, Brunel, Stevenson's); project specific (i.e., London Crossrail, Edinburgh Trams) and discussion (i.e., Elon Musk's Hyperloop and Brunel's Atmospheric Traction Rail). I use two popular series (World's Greatest Bridges / Britain's Greatest Bridges) for the rich picture. In groups of four the students select one different bridge and watch the programme. They are reminded that these programmes are produced for public viewing, and they should interrogate them as civil engineering students. On the day the students are provided with coloured pens and flip chart paper and tasked with creating a group rich picture.

6.7 International Poster Coursework 2015-2023*

The premise for this initiative is based on the need for graduate civil engineers to have a global outlook and to appreciate different cultures and customs. Students work in groups of four and are allocated an international mentor (a peer first-year; senior undergraduate; post-graduate; Erasmus / International student visitor) who has volunteered to talk to the group about culture and customs in their home country. In addition, to suggest typical significant civil engineering structures and buildings in their hometown / country, that students could go away and research. The group are required to produce a large poster with sketchers of these buildings and structures and annotate with text describing some of the salient features. To date this has involved over one-hundred international mentors representing fifty-three different countries.

6.8 Reading for a Degree-A Compulsory Book Reading Coursework & Department Book Club 2009-2015 *

Each year, the freshers were required to read one book from four. The books selected for reading were chosen on the basis that they provided knowledge about the history and heritage of civil engineering including biographical text and / or contemporary accounts of inspirational civil engineering projects. I established a department to run in parallel with the coursework to provide a platform to invite book authors to the department. Excursions   were also undertaken to meet book authors and undertake readings at associated structures. During the 2018-2019 session I developed a 'trojan horse' book reading to allow students to visit civil engineering consultants' offices (Arup and AECOM) to meet book authors, then, to meet graduates and undertake a tour of the offices to learn about industry practice.

6.9 Book Jigsaw Coursework 2016-2023*

During my studies (PG Certificate Learning and Teaching in HE, 2015-16) I was introduced to the concept of flipped learning and the jigsaw classroom (Voyles,

Bailey, and Durik, 2015). This influenced my thinking and I replace the compulsory book reading with a book jigsaw exercised whereby students worked in groups of four. Each student reads a different chapter of an allocated book and during the jigsaw session the following week the students function as teachers to explain to each other key learning from their chapter. I extended this practice with relevant books in my 3-5th year modules. The coursework requires students to write a report on what they consider to be the key learning from each chapter (with associated research) and to reflect on collaboration and communication skills (own and peers) during the jigsaw.

7 Discussion

7.1 Pedagogical Innovation?

In writing this paper I am minded that my pedagogical interventions could be considered as 'show and tell' practice, lacking in transferability, and without sufficient rigour to be considered 'research'. Should readers adopt / adapt these initiatives in their own institution, I can offer no evidence to corroborate a link between my own practice and being designated as an innovative university teacher. However, Walder's (2014) research in Canada (academics concept of pedagogical innovation) does provide a benchmark for comparing my practice. Walder interviewed thirty-two academics (recipients of excellence in teaching awards) and established a framework of seven distinctive notions of the concept of pedagogical innovation. Pertinent to my own practice are- *Novelty* (not following tradition, surprising students, using methods contrary to main tendency) and with relevance to punk, pirate, and guerilla pedagogy- *Human relations* (taking risks, innovation intimately linked to the teacher's personality, innovation is learning as a professor). A link to this paper is apparent- 'Pedagogical innovation stems from very personal origins within the university teacher, who appears to seek to move towards their pedagogical ideal' (p.200).

7.2 Autoethnography, or something else?

In this paper I have sought to employ AE as a research methodology. However, just because I say it is an AE, does not mean it is! 'There can be a messy boundary between autobiography and autoethnography' (Lapadat, 2017, 590) and this paper does perhaps lean towards an autobiographical account. In retrospect, I removed too much narrative from my draft paper where I speak in my own voice (one of the key tenets of AE). I had concerns that this version would have attracted a common criticism of AE research being self-absorbed, self-indulgent, and self-celebrating (Lapadat, 2017). My draft paper contained extracts from my evocative poetry (*Pedagogy in a F****** Box*) that I considered too "off-piste" for a SEFI publication. I also wrestled with the inclusion of narrative that revisited a sustained period where my academic identity was under attack. I took guidance from Ellis, Adams & Bochner (2011) who refer to the need for AE researchers to be cognizant of relational ethics, to consider the danger of implicating colleagues in their narrative. Thus, this paper is perhaps 'nor this not that'. In seeking to reconcile a desire to engage in AE, "and" to provide a paper palatable for an engineering education conference, I have perhaps fallen short in answering the "so what" question- 'Why does (or should) your experience matter to others? Why should readers care about your issues and experiences?' (Herrmann and Adams, 2022, 1).

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