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Using agential morphogenesis to track professional identity development in higher education

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Abstract

Professional identity development (PID) is a growing focus for higher education researchers interested in graduate employability and workplace readiness. This raises the challenge of how to trace students' identity shifts. This paper shows how Margaret Archer's agential morphogenesis can be used to generate understandings of how students' identities change during professional degree programmes. Archer's theories of double and triple morphogenesis are applied to data collected through interviews and documentary research. The findings are presented as narratives about two final-year electrical engineering students who participated in employability-development focussed courses at a South African university. These narratives offer in-depth descriptions of the students' identity shifts as they neared completion of their studies. The richness of the findings, which incorporate the constraints and enablements of the students' professional identity development, leads to the paper's argument that agential morphogenesis is a productive analytical tool for researchers wanting to better understand PID in higher education.

Keywords: higher education, morphogenesis, professional identity development, Realist Social theory, workplace readiness

Introduction

The growing emphasis on student employability within higher education has led to a concomitant focus on professional identity development (PID) in scholarly research within the discipline. Strong alignment with a professional identity (PI) positively impacts students' motivation and persistence within their fields of study (Tomlinson and Jackson, 2019) and contributes to the likelihood of them working within their professions once they graduate (Eliot and Turns, 2011). These factors are important in the context of this study; challenges facing engineering education in South Africa are student throughput and retention in engineering following graduation (Fisher, 2011). However, these issues are not limited to this context. A survey of the scholarly literature

regarding PID in higher education shows that this is an ongoing global, cross-discipline concern (see, for example, Mahon, et al., 2020; Hardy, 2020; Dickerson and Trodd, 2020).

In their systematic review of literature into PID in higher education, Trede, et al. (2012) highlight the range of theories that researchers draw on to make sense of PI. While these are relevant for the studies to which they refer, the authors call for a more cohesive, comprehensive approach to PID that is specific to the higher education context. Similarly, Barbarà-i-Molinero, et al. (2017) refer to research in this area as 'scattered', explaining that there is a need for a conceptual framework that takes a more integrated approach to the factors that influence PID. To this end, Trede, et al. (2012: 382) call for research that answers the question: 'how can we recognise transformation and relate transformative learning to professional identity development?'

This paper provides an answer to this question through its depiction of the use of Margaret Archer's agential morphogenesis (AM) to trace how students' identities evolve and transform throughout their professional degree programmes. Archer's theories are used to analyse data related to two final-year electrical engineering students who completed courses focussed on employability development. The findings provide rich analytical descriptions of the identity transformations that the students experienced during their studies. While the research was carried out within an engineering department, its objective is to propose AM as a productive tool for researchers from any discipline wanting to understand students' PID better.

Literature review

PID has become ubiquitous in research that seeks to engage with how professional programmes in higher education prepare students for the workplace. For example, studies in the disciplines of nursing (Maginnis, 2018), teaching (Assen, et al., 2018), pharmacy practice (Mylrea, et al., 2017), and law (Brooks, 2018) explore ways in which PID can be fostered. The growing emphasis on PID in higher education programmes, particularly those with clear occupational pathways, can be seen as reflecting what Zegwaard, et al. (2017) refer to as a general reframing of workplace-readiness as professional-readiness. In this paradigm, workplace readiness is understood as the extent to which students developed PI (Tan, et al., 2017).

There are many definitions of PI, with Trede, et al. (2012) highlighting the lack of coherence between these as a defining feature of literature in the field. One conception is of PI as a self-positioning in relation to a professional social environment (Trede, et al., 2012). This focus on 'self-positioning' implies a distinction between the individual and the profession, with the individual choosing how they want to position themselves in relation to it. Another conception of PI is a combination of skills, capabilities, values and roles that result in a new 'self' (Smith, et al., 2014; Tan, et al., 2017). In this understanding, the development of PI involves a process of *becoming* something new.

If PI is understood as a newly developed self, then the idea of transformation must be central to any pedagogic initiative aiming for PID. The literature describes different teaching and learning approaches with PID as their primary objective. These include having students: create

eportfolios (Eliot and Turns, 2011; Nudelman, 2017); use blogs to critically reflect on their learning (Fisher and Kim, 2013); engage in work-integrated learning (Trede, 2012); and participate in discipline-specific extracurricular activities (Katz, et al., 2011). While initiatives such as these centre around different learning activities, they all create opportunities for students to consider and articulate personal connections with their disciplines. Thus, students learn to identify their fields' discourses, values, and norms of practice and internalise these over time (Tan, et al., 2017). This process of transformation can contribute to PID.

It is clear from the above that PID has become an objective of higher education programmes seeking to prepare students for the workplace. Also, there are different ways for programmes to encourage PID. However, what remains unclear is how best to assess the impact of these endeavours on students' PID. While PI scales do exist, these are generally not formulated for the higher education space and therefore do not consider factors around student learning (Tan, et al., 2017). Some studies elicit student input through interviews and surveys to better understand their experiences of PID (Kunrath, et al., 2020; Pittman and Foubert, 2016; Smith, et al., 2014). However, these mainly draw on students' *perceptions* of their PID, which, while valuable in their own right, may be swayed by biases. While there is value in longitudinal studies which interrogate students' opinions before graduating and then again once they have been in the workplace for a significant amount of time (Nyström, 2009), these widen the scope of research beyond just higher education. Since participants have now spent time in the workplace, their PIs have been impacted by other factors, making it difficult to assess the impact of higher education.

Thus, there is clearly scope in the higher education PID research to explore ways to understand the transformations students experience as they transition from student to professional. This study asserts that Archer's agential morphogenesis (AM) (Archer, 1995) offers a productive tool for this. Hutchings and Taylor Huber (2008: 238) explain that theory can be especially valuable within educational research because it unifies 'diverse efforts to explain a complex phenomenon'. This is evident in this paper which, after explaining Archer's theory, goes on to show how AM provides space to consider the multiple, concurrent shifts in identity that may occur for students throughout their studies. The main question this paper seeks to address is: How can AM be used to generate understandings of students' PID?

Theoretical framework

This section begins by laying a conceptual base for understanding AM before shifting to a more practical discussion of its relevance within PID research. As part of her Social Realist theory, Archer (1995) uses the concepts of structure, culture, and agency to investigate the relationship between people's actions and the contexts in which they find themselves. These concepts provide an analytical framework with which to understand how structure and culture are transformed by human agency and how agents themselves are transformed in the course of this social transformation (Donati and Archer, 2015).

While structure, culture and agency are continually overlapping, intertwining and influencing one another, Archer (1995) proposes the methodology of analytical dualism, by which

it is possible to analytically separate them for research purposes. This offers a means to examine structure, culture, and agency independently to understand how each develops over time before bringing them back together to develop explanations of how they impinge on one another.

As a means to operationalise analytical dualism, Archer (1995) advances the morphogenetic cycle. According to the cycle, elements of structure, culture and agency interact continuously and either elaborate/change or preserve/maintain a system's form, state or structure (Archer, 1995). Archer terms the former scenario 'morphogenesis' and the latter 'morphostasis'. Figure 1 below depicts the stages of the basic morphogenetic cycle. ('T' represents a given time).

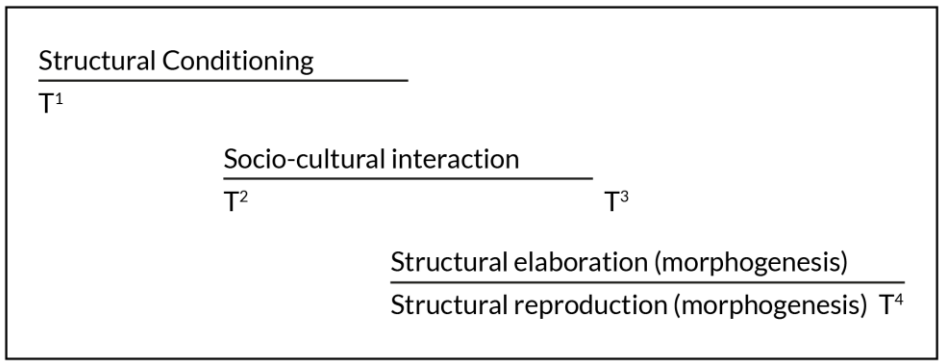

Figure 1: Stages of the basic morphogenetic cycle

In figure 1 above, T1 is the context of structural, cultural or socio-cultural conditioning, considered the emergent consequences of previous actions. T2-T3 is the social, socio-cultural and group interaction, which is structurally conditioned but not structurally determined, since human agents will ultimately decide how/when to act in a particular situation. T4 represents the state of the system at the end of a period of social or socio-cultural interaction. The cycle is then repeated, with T4 becoming T1 for the next morphogenetic cycle. Thus, the morphogenetic cycle provides an 'explanatory framework' (Donati and Archer, 2015: 7) for the transformation that takes place over a given time (T1-T4). Examples of how this can be conceived practically are shared in the next section of this paper.

Structure, culture and agency each have their own morphogenetic cycles, which are continuously operative in society (Archer, 1995). While the morphogenetic approach provides a framework to examine the interplays between structure, culture, and agency within and between T1-T4, analytical dualism provides a conceptually justified means to focus on each morphogenetic cycle independent of the others. This study's concern with students' PID necessitates using a conceptual tool to trace whether and how the students transform during their studies. This discussion goes on to show that AM offers a conceptually sound and empirically productive tool to do this.

To trace how individuals transform over time, Archer proposes that humans consist of three irreducible, emergent strata: persons, social agents, and social actors. To illustrate these strata, let us use the example of Thuli, a new PhD graduate who has recently taken a lecturing position

at a university. Every individual, Archer (2000: 255) explains, is born with a 'continuous sense of self' that emerges early in life and serves as an anchor for the agent and actor that emerge over time. Agency emerges as a result of double morphogenesis, which is based on the concept that agency can lead to the elaboration of structure and culture and may itself be elaborated upon simultaneously. The implication here is that Thuli has the potential to transform the structure and culture of the university while at the same time she may be transformed by it.

Archer distinguishes between two forms of agency to demonstrate how this elaboration takes place. The first, primary agency, refers to the collectivities into which we are born. This involuntary placement sees us assigned positions in relation to society's distribution of resources. Here, Thuli enters the workplace with the same role and responsibilities as the other new lecturers. If primary agents manage to collectively transform themselves in seeking to transform society by organising for collective action, they become corporate agents. An example of this could be if Thuli and some of her colleagues started an advocacy group for female lecturers at the university. Corporate agents are groupings with shared vested interests. Not all primary agents become corporate agents, but those who do have the potential to shape the social context for all agents. This is because when there is a plurality of corporate agents working on influencing social structure in different directions, the structural and cultural landscape is reshaped. Part of this reshaping involves corporate agents extending the array of available social roles through organising for collective action, articulating shared interests and generating social movements. For example, through the advocacy group, Thuli and her colleagues' lobbying could result in the creation of a new leadership position within the university focussed particularly on the empowerment of female lecturers. Through this process, Thuli, her colleagues and the university have all transformed.

When agents find roles that they feel they can invest themselves in, for example Thuli's role as an advocate for female lecturers at the university, they become social actors; Archer (1995) calls this process triple morphogenesis. In identifying with particular roles and choosing to actively personify them, actors also acquire their social identities. Personal identity, on the other hand, refers to the precise and unique balance that we strike between concerns in the natural order (our physical well-being), the practical order (our performative achievements), and the social order (our self-worth) (Archer, 2000: 11). Archer (2000: 296) calls an individual who has managed to attain both a social and personal identity a 'successful subject'. Such a person has located a satisfying role in which, once weighed against concerns in the natural, practical, and social order, they are prepared to invest themselves. Figure 2 below depicts the morphogenesis of personal and social identity.

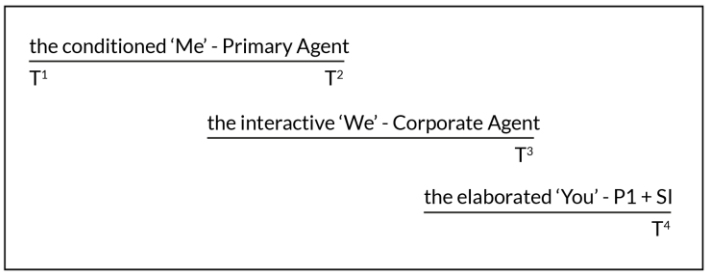

Figure 2: The morphogenesis of personal and social identity

Triple morphogenesis in higher education

At a macro-level, triple morphogenesis is evident in the student experience of higher education. Individuals enter university at T1 as primary agents, with their unique persons having been conditioned by their life experiences. During their time at university, between T2-T3, their active status as students means they may become corporate agents who work together to achieve various ends. Ways in which this could occur are through social movements, tutorial groups and classes. Through these groups, students may transform the structure and culture of the university space. Changing the landscape results in the creation of new roles for students to occupy, both within the university and outside of it. When/if students embody these roles, they emerge at the end of their time at university (at T4) as social actors who have achieved synthesis of their social and personal identities.

At the more micro-level of professional education, morphogenesis can be used to track how students transform throughout their studies. Students enter their disciplinary programmes (e.g. accounting, law, medicine) at T1 as diverse individuals from various backgrounds and become primary agents due to their general status as members of a student body. During their programmes, from T2-T3, they may become corporate agents by participating in various collectivities, such as working in groups to complete particular projects. The goal is that, when they graduate from the degree programme at T4, they do so as social actors, embodying the role of disciplinary 'professional' in balance with their personal concerns. Case (2015: 850) highlights this synthesis of personal and social identity as the end goal of higher education, as this results in a student who 'formulates ultimate concerns and enacts projects towards that end; also a student who occupies that role in a way which gives expression to their personal identity'. However, it is essential to note that this goal is not always achieved, and not all graduates leave higher education as social actors.

Relevance for this study

Social Realist theory is not without critique. Cruickshank (2003: 580) describes Archer's concepts of structure, culture and agency as 'too elastic' to be theoretically useful in that any data can be read into them. King (1999) argues that the division between these concepts is fundamentally flawed, given that both structure and culture can be reduced to the actions of agents interacting with one another to change social conditions. However, these criticisms notwithstanding, morphogenesis does provide a means of practical social theorising because researchers can: a)

analytically separate structure, culture, and agency to track how transformation occurs over a period of time in each of these domains; before b) bringing these back together again to develop understandings about how they impact each other. While the latter is beyond the scope of this study, the argument is made that an analysis of AM (as per the former) offers a fruitful means to track whether and how a student has transformed into a professional. The paper goes on to show how this can be enacted in research into PID using the cases of two final-year electrical engineering students.

Methods

Data generation

This paper forms part of a larger study into the identity work of final-year electrical engineering students who were participating in two concurrent courses focussed explicitly on employability skills at a South African university. The first course, Small Business Development (SBD), aimed to provide students with the knowledge and skills required to start their own business ventures. The second course, Communication Practice (CP), covered communication skills-related content like how to write a business plan and prepare a funding pitch. These courses' specific focus on preparing students for post-graduation life made them appropriate research sites for this study's focus on PID since students were actively contemplating and engaging with their post-university, professional lives through curriculum, pedagogy and assessment. For this study, T1 represented the time before the SBD and CP courses, T2-T3 represented the courses' duration, and T4 represented the following period.

Six initial focus group interviews were held (comprising 20 students in total). Students shared their reasons for studying electrical engineering, their general perceptions of the programme, concerns for the future and motivating factors. This provided insight into T1.

To understand T2-T3, course material including handouts, teaching slides and task descriptions for both the SBD and CP courses was utilised. This provided an overview of the structure and content of the courses. Additionally, 11 students were chosen from the focus group interviews to participate in individual in-depth semi-structured interviews. Purposive sampling was used to identify these participants (Durrheim, 2012). Students who were diverse in age, social background, race, nationality, and gender were specifically selected to provide a range of perspectives and experiences. The focus of the individual interviews was more personal than the focus group interviews. Students were asked to reflect on their studies, particular moments of their degrees, and any shifts that may have occurred in terms of their understanding of professionalism. The students' CVs and eportfolios, which were developed as part of the CP course, were utilised as additional data sources.

As is clear from the above, a qualitative approach was adopted for this research. While quantitative methods can be beneficial to determine trends and correlations, qualitative methods such as interviews are particularly useful for examining experiences of a small number of individuals because they have, at their heart, the deep exploration of stories (Kelly and Bowe, 2011). This focus on eliciting stories was critical given this study's utilisation of AM as an analytical

tool. Thus, qualitative research methods enabled the 'thick descriptions' (Cousin, 2013, p. 133) of the development/lack thereof of the students' PID.

Data analysis

NVivo computer-assisted qualitative data analysis software was utilised to process and manage the study data. Coding of the data was informed by Maxwell's (2013) distinctions between organisational, theoretical and substantive categories.

Organisational categories are broad areas and issues that may be identified before the data generation and can be understood as 'bins' for sorting the data for further analysis. For this study, this included broad categories such as 'electrical engineering degree in general', 'motivations for study', 'practical work', and 'career goals'. These codes enabled data organisation and initial understandings of the students' experiences.

The theoretical coding categories ensured that the use of data was aligned with the study's conceptual framework. In particular, in line with Archer's analytical theory, 'agency' was coded distinct from 'structure' and 'culture'. Moreover, the data was also coded according to whether they related to T1, T2-T3, or T4 of the morphogenetic cycle. The codes under T1 alluded to the participants' experiences up to entering the electrical engineering degree. Those between T2-T3 relate specifically to the duration of the two employability development courses. Finally, T4 included codes referring to the students' concerns, plans and perceptions of the future.

Substantive categories are primarily descriptive and include descriptions of participants' concepts and beliefs (Maxwell, 2013). For this study, some of the substantive categories used were 'focus on theoretical information', 'support from other students' and 'nearly quitting'.

In addition to these coding strategies, the study also drew on 'connecting' analytical strategies (Maxwell, 2012). According to Maxwell (2012: 116), connecting analytical strategies move beyond the coding step of data analysis to focus on the 'structure or significance of the narrative conveyed by the data'. To this end, narrative vignettes were drawn up based on the accounts of different students who provided pertinent examples of the development of professional engineering identities. These vignettes wove together the codes assigned to the course documents and the individuals' interviews, CVs, eportfolios to 'tell a story' about the students. The objective was to understand how these students did/did not develop professional engineering identities at T4.

The vignettes below show the application of AM to the data generated about two students: Vuyo and Faith. These were chosen for this paper because they present contrasting outcomes in terms of AM. Vuyo hailed from a rural village, and his story shows that he did emerge as a social actor during his studies, having found in engineering a role which he felt he could embody in balance with his personal identity. On the other hand, Faith remained a primary agent throughout the courses and did not transform into a social actor. Their experiences are discussed in the next section.

Findings

Vuyo

As discussed above, students experience many cycles of AM concurrently. As such, Figure 2 above, which depicts the acquisition of social identity, also relates strongly to Vuyo's university experience as a whole. Vuyo's arrival at university signalled his positioning as a primary agent in that, as a student, he wielded little agency regarding the structural and cultural context of the university. For example, he had no influence over course curricula, assessment dates, or the food available on campus. However, having come from a small rural village where he had not received any sort of career guidance while at school, he had strong feelings concerning changing the status quo for current high school students. Thus, he and the few members of his high school class who were also studying at universities decided that, when they returned to their village during vacations, they would run workshops for the learners at their local school to make them aware of their post-school education options. Thus, Vuyo became part of a group of corporate agents who sought to work together to transform their society by empowering learners to attain further education. In doing so, they created a transformed interpretation of the role of 'graduate' (the result of double morphogenesis), adding an aspect of responsibility for social transformation. Vuyo's personal qualities of commitment and social responsibility were directly aligned to his corporate agent role. It can therefore be said that he was a social actor in this sphere of his life.

This enactment of AM was not explicitly tied to the field of engineering or PID. None of the fellow corporate agents to whom he referred was studying engineering; what connected them was that they were all working towards degrees that would provide them with a means of finding employment and earning reasonable salaries. For Vuyo, the purpose of a university education was not to pursue one's passions; rather, when choosing what to study, learners needed to consider 'Is it going to help me··· live a better life than I am living now?'. This functionalist approach to university education also extended to the strategies that he adopted within his studies. His goal was to pass, and since he believed that this meant cramming material rather than engaging with it for understanding, this was the approach that he adopted.

However, his experience of the SBD and CP courses had challenged this approach because both courses required him to draw on new skills. Whereas, in the engineering courses, '... it's 1 plus 1 is equal to 2. There's no other thing you can do with that. It's this right answer or this wrong answer', in the SBD and the CP courses, he was faced with an ambivalence to which he was unaccustomed. Rather than simply providing the one correct answer to a problem, like in his engineering courses, Vuyo now found himself having to consider issues such as audience requirements, how to structure an answer so that it corresponds to the specifications of a task and argument formulation. Here, he gave the specific example of the ethics essay that students were required to write for the CP course. The essay task laid out an ethically challenging scenario for the students and asked them to respond to it, formulating an ethical argument by incorporating a professional Code of Conduct. Vuyo explained that he did not know how to answer it when he first read the question and had felt overwhelmed. However, he then decided to approach the topic systematically, breaking it into separate parts, ensuring that he understood

the requirements and formulating a plan for his response before he started writing. While this strategy did not guarantee that he would come up with a 'correct' answer, he felt that the process helped him connect with the material more deeply than in his usual courses, wherein he had worked out how to pass assignments and exams without really understanding the material. Thus, in finding ways to cope with the ambivalence engendered by the more open-ended tasks in the SBD and CP courses, Vuyo showed critical thinking and meaning making.

Another related way the SBD and CP courses differed from Vuyo's engineering courses was their assessment approaches. He was accustomed to assignments in which the correct answer earned him good marks and an incorrect answer did not. This was far more straightforward than the SBD and CP course assignments, which were graded more subjectively. For these tasks, he felt that the reasoning behind the marks he achieved was inexplicit. Even for assignments for which there were rubrics, he wondered what the differentiating factors were between receiving 3/5 or 4/5 for a section and whether this was driven by the lecturer's mood. Concerning his own experience, Vuyo believed that his lecturer had marked too generously when assessing his written tasks, stating that he felt his marks were too high given the feedback he had received regarding grammar.

Before coming to university, Vuyo had never considered what professional field he would like to enter. Both medicine and engineering had been suggested to him, so, with very little knowledge of what either entailed, he applied for and was accepted to both. He initially chose to study medicine, but after his funding fell through, he took up a bursary from a petrochemical company and changed to electrical engineering. In retrospect, Vuyo counted himself lucky because he 'fell in love with' engineering over the years of the degree programme. However, his decision to study engineering was clearly influenced far more by available funding than by a deep desire to be an engineer.

The notion of falling in love with a field implies that Vuyo came to learn more about engineering throughout his studies. The new ways of thinking engendered by the SBD and CP courses added to his conception of what an engineer is. For example, he stated that, while he had initially been sceptical of the idea of having guest lecturers from industry present in the SBD course, these had ended up being his favourite part of the course. This was because their multifaceted stories had shown him that an engineer does not only have to deal with technical things but 'can venture into anything'. In addition, his approach to tasks in this course pairing was different to that which he adopted in his technical engineering subjects. He became aware that, far from being straightforward, engineering tasks could be complex and entail subtleties and ambiguities that stretched him beyond merely providing correct technical solutions.

Thus, the SBD and CP courses expanded Vuyo's understanding of what being an engineer entails. The end of an AM cycle represents the point at which a person has found a role in which he finds it worthwhile to invest himself and has the personal identity to personify it in a manner that reflects his personal qualities (Archer, 2000). In engineering, Vuyo found a role that he had come to love because of what he had learnt at university, including that which was taught through the SBD and CP courses. Moreover, this was a role through which his values of commitment and

social responsibility could be enacted, given that, as a professional engineer, he would have the means (both financial and in terms of experience) to 'give back' to his community. Vuyo's status as a primary agent from a small rural village influenced the type of social actor he could become in that the only reason he studied engineering was that he received a bursary. However, it is clear that, in engineering, he found a role in which his personal and social identity were in synthesis.

Faith

Faith's father was an engineer, and, growing up in middle-class Kenya, she had seen how he and his engineer friends worked in many different professional fields. The broad scope of career possibilities available to engineering graduates meant that, by choosing to study engineering, Faith felt she had discovered a way to keep her career options open. As she approached the end of her degree four years later, Faith was still unsure whether she wanted to work as an engineer. If Archer's (1995) understanding of a social actor is an individual who chooses to identify themselves with a particular role and actively personify it, then it cannot be stated that Faith's years at university had enabled her agential morphogenesis to a social actor. This is because the engineering role was neither one that she actively chose nor one with which she felt any strong personal alignment.

How Faith referred to her experience of the SBD and CP courses articulated her positioning as a primary agent, which denotes a member of a group of people who share the same life chances and lack a say in structural and cultural modelling (Archer, 1995). For example, with regards to the SBD course, she said '… we've never done a business plan before, we have no business background' and '… another thing that we struggle with is what we need to learn'. When discussing the CP course, her opinion regarding the texts that the students were required to produce, such as business plans and posters, was that 'it was different for us because for a lot of us… naturally, what you want to do is think of people as the consumer, so I think it was nice, them making us try to approach it like we're talking to investors.' Faith's use in these examples of the personal pronouns 'we' and 'us' indicates her sense that she is a member of a collectivity, which, in this case, was the cohort of students registered for the two courses.

Furthermore, while she thought there was a great deal about the SBD course in particular that could be improved, her suggestions were always phrased so that they referred to changes that only the course convenors could make. For example, regarding idea generation for a new venture, she said, 'for the whole coming up with the idea, I wish they had told us earlier, like over December. It's hard coming up with ideas when you're told you've got one week'. Of the business plan task, she stated, 'I think it would have been nicer if they broke it down into milestones. Then, at every point, they evaluate, and then you can improve'. Thus, her response to her dissatisfaction with SBD was to propose that the course convenor make systemic changes to the course. This is in contrast to what her reaction may have been had she had been operating as part of a group of corporate agents. In this case, the students may have lobbied the Engineering Faculty to have the course changed or organised an appointment with the convenor to attain their goals.

Faith did demonstrate awareness of the nature of the engineering role, and, according to her, this was influenced by her experience of the CP course. She shared her sense that the focus of the course was '… how to present yourself as a professional. To put across your ideas in whatever form they require… I think it's just how to behave as a professional'. Here, her use of the phrases '*present yourself* as a professional' and '*behave as* a professional' are telling, as they indicate her sense that there is a pre-existing role of a 'professional engineer' and that, if people are to inhabit this role, they need to know how to replicate its norms. This shows that Faith was not concerned with challenging this pre-existing role to transform what is commonly expected of an engineer, which she may have been if she were a corporate agent. Instead, she accepted the representation of the professional engineer that was portrayed to her through her studies, including the SBD and CP courses.

However, solely because Faith accepted the veracity of the SBD and CP courses representations of a professional engineer does not mean that it resonated with her to the point that she was willing to invest herself in it, which is a requirement for becoming a social actor. Given her ambivalence regarding working as a professional engineer, it was unlikely that two courses would have swayed her to such a degree that she would have changed her mind about this. However, it is clear that aspects of the course pairing directly constrained her agential morphogenesis. If adopting a social identity such as the engineering role entails a deep personal connection, Faith found that this was hampered by the requirement that the new venture that the students developed for SBD had to include the Internet of Things. This was because, as she explained, South Africa's high Internet costs and inadequate coverage mean that the majority of the country's population would never have access to the products that the students developed, meaning whatever ideas her group came up with would inevitably be elitist and impractical. She thought that 'if they'd actually give us freedom to actually look at real problems and try to solve those problems, we could have done a lot' and that this would have promoted deeper engagement with the project.

Likewise, while she felt that the CP course generally 'did a pretty good job', she experienced a similar lack of connection with the tasks that were set due to their inauthenticity. She found that the process of creating texts such as the poster and the executive summary that were targeted at investors was limiting because of her awareness that the texts were not real. Since the texts had no real implications, she said, 'you only go so far with everything you do'. Moreover, while she valued the opportunity that the eportfolio task had provided her to review her CV and distil essential information concerning her experience and skills, she was not convinced that her website would be of any use to her once the course ended. As she explained, 'I thought that was random… do employers really look at those?'.

All this is not to say that the courses had no impact on Faith; on the contrary, her participation in the SBD and CP course pairing provided her with a space for personal development. For example, her favourite part of the CP course was when she was engaged in writing activities aimed at a particular audience. Here, she referred to how a product description would differ depending on whether it was aimed at a customer or an investor. This had shown

her that 'it's cool how words have power' and can thus be said to have contributed to her written communication skills. When her SBD group members failed to demonstrate initiative and work on the project halted, she had drawn on her leadership abilities to steer the group back on course. Finally, by watching her classmates deliver their CP presentations, she had realised that people are more interesting to listen to when they seem passionate about their subject. In attempting to integrate this into her own presentation style, Faith strengthened her oral communication skills.

Therefore, it is clear that while the SBD and CP courses did not facilitate Faith's transformation into a social actor, they did impact her in terms of agential morphogenesis. Faith accepted the representation of the engineering role portrayed and did not band together with other students to redefine it. However, as described above, the development of her personal qualities contributed to her personal identity, which would be the anchor for any agent or social actor that she may become in the future.

Conclusion

The objective of this study was to show how AM can be used as a tool to generate understanding of students' PID. Archer's conceptual tools of analytical dualism and the morphogenetic cycle were applied to data drawn from individual interviews, focus group interviews, course materials, CVs and eportfolios to create narrative vignettes that provide insight into the identity work of two final-year electrical engineering students as they shifted from T1 to T2-T3 and then T4. Vuyo was shown to have become a social actor by finding a role that he felt he could personify - that of a professional engineer. This shows PID. Contrastingly, Faith remained a primary agent, and therefore, the paper argues, she did not develop a professional engineering identity.

The analyses that emerged from the data yielded rich descriptions of the students' identity work. The narrative vignettes were built on more than just student perceptions. Instead, they incorporated elements such as the students' biographies, values, long-term aspirations, and the work they had created during the SBD and CP courses. A tool such as AM that enables this richness of findings holds value in a field such as higher education, where researchers grapple with complex ideas around teaching and learning. As Cousin (2013) explains, how students learn is influenced by many factors, including institutional setting, family and community. AM can incorporate all of these elements, thus making it an appropriate tool for higher education research.

In addition to highlighting AM's usefulness as a tool, the study also yielded valuable insight into factors that enable and constrain students' professional identity development. For example, Vuyo's narrative shows that the opportunities to think critically about his work afforded by the open-ended tasks in the SBD and CP courses deepened his personal engagement with the material. In addition, exposure to guest lecturers from industry widened his understanding of engineering professionalism and the kind of role he may one day take on. These factors enabled his PID. While Faith's PID was constrained by the inauthenticity of the tasks set in SBD and CP, the opportunities to practice skills such as written and oral communication, leadership, and

teamwork led to the development of her personal identity. For educators specifically looking to foster students' PID through their courses, this kind of knowledge can be invaluable when designing curriculum.

For future research, it would be productive to use AM within disciplines other than engineering education to understand whether universal factors enable and constrain PID in higher education or whether this is discipline specific. It could also be valuable to conduct follow up studies with Vuyo and Faith. Now graduated and most likely in industry, they could provide insight into how this study's findings regarding their PIDs correspond to the professional paths that they have followed. Finally, it would be fruitful to extend the analysis beyond AM to include the morphogenesis of structure and culture during the SBD and CP courses. An examination into the relations between structure, culture and agency would likely result in rich explanations of how structure and culture impacted Faith and Vuyo during the courses and, in turn, of how the students impacted the structures and culture with which they interacted during the courses.

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References

Archer, M.S. 2000. *Being Human: The Problem of Agency*. New York: Cambridge University Press.

Archer, M.S. 1995. *Realist Social Theory: The Morphogenetic Approach*. New York: Cambridge University Press.

Assen, J.H.E., Koops, H., Meijers, F., Otting, H. & Poell, R.F. 2018. How can a dialogue support teachers' professional identity development? Harmonising multiple teacher I-positions. *Teaching and Teacher Education*, 73: 130-140.

Barbarà-i-Molinero, A., Cascón-Pereira, R., Hernández-Lara, A.B. 2017. Professional identity development in higher education: influencing factors. *International Journal of Educational Management,* 31(2): 189-203.

Brooks, S.L. 2018. Fostering wholehearted lawyers: Practical guidance for supporting law students' professional identity formation. *University of St. Thomas Law Journal,* 14(2): 412-432.

Case, J.M. 2015. A social realist perspective on student learning in higher education: The morphogenesis of agency. *Higher Education Research & Development*, 34(5): 841-852.

Cousin, G. 2013. Getting to the bottom of the well: the value of qualitative research into teaching and learning. *Critical Studies in Teaching and Learning*, 1(1): 123-136.

Cruickshank, J. (ed.) 2003. *Critical Realism: The Difference it Makes*. London: Routledge.

Dickerson, C., Trodd, L., 2020. Gaining professional recognition: Exploring professionality and professional identity of early years practitioners in higher education. *Teaching in Higher Education.* DOI: 10.1080/13562517.2020.1724935

Donati, P., Archer, M.S., 2015. The relational subject. Cambridge University Press, Cambridge.

Duemer, L., Fontenot, D., Gumfory, K., Kallus, M., Larsen, J., Schafer, S. & Shaw, B. 2002. The use of online synchronous discussion groups to enhance community formation and professional identity development. *The Journal of Interactive Online Learning,* 1(2): 1–12.

Durrheim, K. 2012. Research design. In Terreblanche, M., Durrheim, K. & Painter, D. (eds.)*Research in Practice: Applied Methods for the Social Sciences*. Cape Town: University of Cape Town Press, Cape Town: 33-59.

Eliot, M. & Turns, J. 2011. Constructing professional portfolios: Sense-making and professional identity development for engineering undergraduates. *Journal of Engineering Education,* 100(4): 630-654.

Fisher, G. 2011. Improving throughput in the engineering Bachelors degree. Bruma: ECSA.

Fisher, L. & Kim, D. 2013. Two approaches to the use of blogs in pre-service foreign language teachers' professional development: A comparative study in the context of two universities in the UK and the US. *The Language Learning Journal,* 41(2): 142-160.

Hardy, G.S., 2020. Exploring professional identity development in medical laboratory professional students. Unpublished PhD diss., University of Calgary, Canada.

Hutchings, P. & Taylor Huber, M. 2008. Placing theory in the scholarship of teaching and learning. *Arts and Humanities in Higher Education,* 7(3): 229-244.

Katz, P., McGinnis, J.R., Hestness, E., Riedinger, K., Marbach-Ad, G., Dai, A. & Pease, R. 2011. Professional identity development of teacher candidates participating in an informal science education internship: A focus on drawings as evidence. *International Journal of Science Education,* 33(9): 1169-1197.

King, A. 1999. Against structure: A critique of morphogenetic social theory. *The Sociological Review,* 47(2): 199-227.

Kunrath, K., Cash, P. & Kleinsmann, M. 2020. Social- and self-perception of designers' professional identity. *Journal of Engineering Design,* 31(2): 100-126.

Maginnis, C. 2018. A discussion of professional identity development in nursing students. *Journal of Perspectives in Applied Academic Practice*, 6(1): 91-97.

Mahon, M., Conway, T., Farrell, M. & McDonagh, J. 2020. Geography graduates' professional socialisation and identity development through service learning. *All Ireland Journal of Higher Education,* 12(1).

Maxwell, J.A. 2013. *Qualitative Research Design: An Interactive Approach*. 3rd edition. Thousand Oaks: SAGE Publications, Thousand Oaks.

Maxwell, J.A. 2012. *A Realist Approach for Qualitative Research*. Thousand Oaks: SAGE Publications.

Mylrea, M.F., Gupta, T.S. & Glass, B.D. 2017. Validation of a motivation survey tool for pharmacy students: exploring a link to professional identity development. *Currents in Pharmacy Teaching and Learning,* 9(5): 763-769.

Nudelman, G.R., 2017. Engineering identity: Analysing e-portfolios in a professional communications course. *South African Journal of Higher Education,* 31(2): 211-225.

Nyström, S. 2009. The dynamics of professional identity formation: graduates' transitions from higher education to working life. *Vocations and Learning,* 2(1): 1-18.

Pittman, E.C. & Foubert, J.D. 2016. Predictors of professional identity development for student affairs professionals. *Journal of Student Affairs Research and Practice,* 53(1): 13-25. https://doi.org/10.1080/19496591.2016.1087857

Riley, D., Slaton, A.E. & Pawley, A.L. 2014. Social justice and inclusion: women and minorities in engineering. In Johri, A. & Olds, B.M. (eds.) *Cambridge Handbook of Engineering Education Research*. New York: Cambridge University Press, 335-356.

Smith, S., Sobolewska, E. & Smith, I. 2014. From employability attributes to professional identity: students transitioning to the workplace. In *2014 IEEE Frontiers in Education Conference (FIE) Proceedings*. IEEE, 1-8.

Tan, C.P., Van der Molen, H.T. & Schmidt, H.G. 2017. A measure of professional identity development for professional education. *Studies in Higher Education*, 42(8): 1504-1519.

Tomlinson, M. & Jackson, D. 2019. Professional identity formation in contemporary higher education students. *Studies in Higher Education,* 46(4): 885-900.

Trede, F. 2012. Role of work-integrated learning in developing professionalism and professional identity. *International Journal of Work-Integrated Learning,* 13(3): 159-167.

Trede, F., Macklin, R. & Bridges, D. 2012. Professional identity development: a review of the higher education literature. *Studies in Higher Education,* 37(3): 365-384. https://doi.org/10.1080/03075079.2010.521237

Zegwaard, K.E., Campbell, M. & Pretti, T.J. 2017. Professional identities and ethics: The role of work-integrated learning in developing agentic professionals. *Work-Integrated Learning in the 21st Century: Global Perspectives on the Future*. Bingley: Emerald Publishing Limited, 145-160.