INNOVATE OR STANDARDIZE? THE CHALLENGES OF CREATING EDUCATIONAL DIVERSITY IN A SYSTEM OF HOMOGENEOUS PRACTICE

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Abstract: Standards play an important role in professional, educational and institutional practices. Professional accreditation bodies establish standards to provide a benchmark for the profession across institutions. Currently, Universities prescribe programme structures, management of delivery and assessment of the individual modules; from how to formulate intended learning outcomes to how to assess their attainment. Although a holistic approach as to how to attain these standards is desirable, the reality is that in many cases the quality of education is based on few metrics that in some instances are biased. On the basis of these metrics decisions about the management of the educational business are made whereby uniformity, in teaching and assessment practices, is valued above innovation. The rigidity and uniformity of some practices affect the autonomy of educators as professionals with the potential to hinder their relationships with others in the institutional ecology and in turn the development of creative ideas. Many current educational practices are simply imposing standardization of learning that go against the grain of delivering on the development of graduates that are adaptable and resilient. How is it possible to train graduates to face uncertainty when all modules are delivered in the same manner? How can students learn to face new situations when they are faced with 'uniform' educational practices? Within rapid changing professions, how can institutions provide sufficient autonomy to educators while ensuring standards are met? In this work we explore trends for standardizing education and the impact these have on the professional agency of educators.

Keywords: standardisation, engineering education, professional agency, innovation, flexibility, professionalism.

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1. INTRODUCTION

1.1 Motivation and background

Standards in education drive improvement and allow us to maintain quality through benchmarking. In higher education and in particular within engineering education there are a number of standards that can typically be categorised as professional, educational frameworks and quality assurance standards.

In this paper we set out a study designed to consider how educational practises that become standards are applied at institutional and module level, their impact on educators' autonomy and, how these practices might stifle the creation of fit-for-purpose educational experiences. In doing so we recognise that institutions must integrate requirements from professional, educational and quality frameworks with stakeholders' input. A brief review of these different aspects is offered next to provide context.

The engineering professional standards are commonly set at national level by professional bodies such as the case of Engineering Council in the UK, Engineers Australia or Engineers Malaysia. These professional bodies set accreditation requirements for higher education programmes to demonstrate levels of professional competence (Engineering Council UK, 2020). As the custodians of professional engineering standards and qualifications these professional bodies also are members of international alliances, such as the Washington Accord (International Engineering Alliance, 2022), that allow them to work together to maintain international benchmarks to help with professional mobility. Engineering programmes that are accredited by professional bodies in each country adhere to their associated set of standards.

In addition to professional standards, engineering education is also regulated by educational standards and frameworks such as 'The UK Quality Code for Higher Education' produced by the Quality Assurance Agency for Higher Education in the UK (Quality Assurance Agency, 2020). QAA, as an independent body in the UK, provides advice and helps monitor standards in higher education to assure international quality. The 'UK Quality Code' considers two sets of expectations one for national qualifications and the other for quality of the academic experience. Similar to professional bodies, the QAA works with the government and higher education institutions globally to improve education.

Based on these frameworks for accreditation and quality of education individual institutions set the governance of their educational programmes. Against these, institutions also need to integrate research-informed frameworks and approaches to design and deliver engineering programmes that meet both professional accreditation requirements and quality assurance. There is no doubt that frameworks of standards impact on philosophies of education management, programme design and adoption of pedagogical approaches to teaching delivery creating in turn 'local' institutional standards for delivering engineering education.

These 'local' institutional standards and practices become what would be the expected 'norms' of teaching and learning at specific institution. These 'norms' are typically aligned with current trends on delivery of teaching and assessment and, are informed by state of the art scholarly work. For instance; lectures, tutorials, virtual learning environments, flipped classroom, examinations, projects to name a few. More generally, these institutional 'norms' create cultures and environmental ecologies that impact on the educators and students as individual in the institutional ecosystem. Finally, within the institution itself micro-ecologies can also be found whereby individual departments also adapt and include local practices that become new 'norms' which might or not be aligned with the beliefs, values and agentic stance (i.e. related to professional practice) of individual educators.

Finally, in addition to all the standards and 'norms' previously mentioned, there is also standards that are applicable to professionals engaged in delivering education. One such framework is the 'The UK Professional Standards Framework –for teaching and supporting learning in higher education' provided by Advance Higher Education (Advance HE, 2020). This again have a direct impact on individual educators' decisions and career progression.

Although it is recognised here that standards are important within the educational business, we argue that these have also the potential for creating systems that are too prescriptive, rigid and uniform. They not only impact on the outcomes of the educational experience students get but also on how the education is conducted, how educators are expected to perform and ultimately on the educator as a professional.

In Chemical Engineering, which is the discipline of focus in this study, the professional standards are set by the accreditation requirements that the Institution of Chemical Engineers (IChemE) sets in alignment with the requirements from AHEP4 by the Engineering Council (Engineering Council, 2020.). In the case of the IChemE the achievement of accreditation is based on the evidence of the learning outcomes delivered in a programme in different disciplinary contexts. However, it is important to note that the IChemE accreditation encourages institutions to meet these standards while being innovative in the programme delivery.

1.2 Challenges for innovation in education

In the UK in the last decades the neoliberal policies of government have constraint the way education is conducted at all levels. The of focus has changed to qualifications and knowledge with a greater emphasis on quality control measures limiting to a great degree its social focus. In consequence, educators find themselves at tension between their philosophical and professional beliefs and the expectations imposed upon them by the system (Bowl, 2014). The effect that the policies and standardisation have on educators as agents of innovation and change has been studied before mostly in compulsory education (Buchanan, 2015; Bonner et al., 2020) but less is known about educators working in the higher education sector (Hinostrosa-Paredes, 2020).

Connors and Bengtson (2020) studied the professional agency of two new secondary school teachers during their first year working as teachers in relation to management's response to changes in standards. They considered two main aspects of professionalism in relation to the rigid organisational response to change; organisational professionalism (i.e. relevant to the control the organisation exerts) and occupational professionalism (i.e. relevant to agentic decision-making in the profession). They find that teachers feel the need to meet the expectations imposed by standards which constrain their autonomic decision-making and their vision of how teaching should be done. In addition, they find that the school's culture can play a critical role in how teachers position themselves in relation to their role as educators and, that school management can play a key role in defining professionalism within the school.

Metrics that somehow attempt to measure quality of educational experiences such as the National Student Survey (NSS) in the UK can also be used by institutions to enforce specific practices or approaches at programme level. For instance, in response to students' comments in the NSS about low quality videos produced by academics and institution makes it a requirement that all educational videos produced must comply with specific expectations such as the use of branding

and studio recordings. This kind of standardisation, which we will refer here as 'institutional norms', is similar to what Connors and Bengtson (2020) called organisational professionalism and, places a demand on academics that might go against educators' agency. In a similar manner, internal course/module evaluations at institutional level also impact on the autonomy of educators to carried out their job. For instance, in response to students' comments about wanting to have exams with the same format the management team of the programme decides the adoption of a fixed structure for exams such as prescribing the exact number of questions. Although metrics like these mentioned here are not the specific focus in this study they might be of relevance here as we are interested on investigating how 'institutional norms' impact on educator's agency and how this in turns impacts on the educational experience.

In relation to the impact on educational experiences and in the current global situation, we constantly hear about the need for engineering graduates to be resilient, adaptable and able to deal with uncertainty. However, a chemical engineering department in the UK prescribed that all modules should be assessed using 30% coursework, 20% a test during the semester, and 50% an exam after classes finish. For a 10-credit module, it was specified that the exam should only have 2 questions, each of 25 marks. This represents a problem as it does not provide freedom to give appropriate weight in the assessment to each intended learning outcomes. Similarly, another department prescribed that there should not be more than 2 points of assessments for every 10-credits which presents a difficulty for modules where frequent practice to scaffold knowledge is critical. These practices are justified as a way to provide 'stability' but they also lead to a homogenous learning environment that restricts the exposure of students to diverse new situations such as those they could encounter later as graduates at the workplace.

We argue here that many current educational practices that are a result of the drive for standardization of learning go against the grain of delivering on the skill set mentioned above leaving higher education with students that are less adaptable and have little resilience. How is it possible to train graduates to face uncertainty when all modules are delivered in the same manner? How can students learn to face new situations when they are always face with the same? How can graduates be able to adapt and translate knowledge from one situation to another when they have only learnt by rot? With a rapid changing environment, how can we provide sufficient flexibility while ensuring standards are met? How can achieving these standards be reconciled with developing the professional agency of educators? How local cultures and environments supports and constrain educators' professional agency? These questions are what we intend to address in this study. We will explore further the experiences of educators during the Covid19 pandemic when it was necessary to move outside institutional norms providing opportunities for innovation. Moreover, we are also interested in learning about a possible transition to 'new' norms post-Covid19.

2. METHODOLOGY AND METHODS

This ongoing study is defined in the context of Chemical Engineering programmes within the UK higher education and investigates to investigate the standardisation of educational practices and the experiences of academics in relation to how they experience these changes. We are particularly interested in the impact that the adoption of uniform standard teaching and assessment practices

in programmes across modules have on the agency of individual educators and their working environment seen through the educational experience they create.

The research questions guiding the study are: what are current trends for standardising practices in chemical engineering teaching, how standardising practices influence educators' autonomy to innovate and, how these practices impact on specific educational experiences.

In considering the matter of educators' agency, Bandura's (2000) theory of human agency anchors the conceptualisation of agency in this study, in particular when considering individual's 'self-reactiveness' (i.e. ability of making own plans and adopting strategies for their regulated execution) and how this is socially situated. More specifically, we will use the conceptualisation proposed by Eteläpelto et at. (2013) that considers a subject-centred socio-cultural approach to professional agency where the individual's agency is practised and enacted through choices and is intrinsically linked to the individual's work identities and experiences, is temporally constructed and, is also constraint by the environment and circumstances. They further propose that professional agency is necessary for individuals to be creative and develop their work and working communities successfully. These ideas will be explored within the data obtained in this study.

Primary data will be collected via online in-depth interviews with individual academics working in Chemical Engineering departments across the UK. The in-depth interviews will allow to generate data in which both breadth and depth of the individual's experience can be explored (Yeo et al., 2014). Individual academics will be invited to participate and their participation will be on a voluntary basis. Interviews will be transcribed and subsequently analysed. In addition, information about standardised practices in teaching or assessment in individual institutions will be collected. Ethical approval has been obtained from the Departmental Ethics Committee. Participants will be provided with an information sheet and asked to give consent to participate prior being interviewed.

The analytical approach taken will Thematic analysis which is suitable for the research questions to be explored in this study (Braun and Clarke, 2013) and the data collected (Xu and Zammit, 2020). Through this approach we expect to find the relevant aspects to support educator agency and discover also latent ideas related to the educator's identities (e.g. individual, professional).

3. CONCLUSIONS

In this paper we propose a research design to investigate the impact that 'institutional norms' and standardisation approaches impact on the educator's agency and in turn the educational experience. We consider here the ecology of the institution and the relationships at play between the system, represented by education management, and the educators as both individual professionals and agents of change that can bring the innovation necessary to fulfil the not only the educational mission of their institutions but also within their professions in future.

Through in-depth interviews with individual academics we expect to find both breadth and depth of ideas that allow us to understand better how to develop professional agency that promotes instead of hinders creative pedagogical approaches and that helps to develop educators, and in turn students, into life-long learners.

This work also aims to provide further understanding on the benefits of standardisation of education and inform policy makers at institution and national level in order to enable sustain development of innovative educational practices.

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