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Entrepreneurial thinking in radiography: Developing an imaging facility to support the future workforce

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ABSTRACT

Objectives: This article explores the significance of recognising and utilising entrepreneurial attributes—such as knowledge, skills, talent, and experience—to develop radiography education guided by a LUCID framework. It aims to demonstrate how enterprising behaviours and competencies can enhance human actions and address healthcare challenges, thereby improving employability in line with the College of Radiographers Education and Career Framework and industry demands.
Key findings: The article defines the concepts of Enterprise and Entrepreneurship and discusses the importance of understanding one's accumulated skills and experiences, known as Human Capital, for personal and professional growth. It illustrates how entrepreneurial thinking and utilisation of the LUCID framework facilitated the development of an imaging facility, which reflects a commitment to innovation and excellence in radiography education.
Conclusion: The article concludes that adopting entrepreneurial practices and reflecting on one's human capital can significantly benefit radiographers and educators. This approach not only enhances personal and professional development but also adds value to the profession, employers, and patients.
Implications for practice: Radiographers and educators are encouraged to adopt entrepreneurial practices and reflect on their human capital to identify areas for improvement. This can lead to better healthcare outcomes, improved employability, and alignment with industry demands and the College of Radiographers Education and Career Framework.

Objectives

The objective of this article is to highlight how an enhanced understanding of one's entrepreneurial attributes in terms of the accumulated knowledge, skills, talent, and experience can add value to radiographers. This article aims to demonstrate how enterprising behaviours, attributes and competencies can add value in terms of a human action and encourages other radiographers and educators to adopt and apply entrepreneurial thinking and practices in their own contexts, sharing and learning from each other's experiences and achievements.

This article provides a viewpoint from the entrepreneurial skills and competencies of two academics, and the application of those in the context of Radiography. It provides an example of how these skills could look to address some of the current challenges in the healthcare industry[1] and have the potential to enhance employability, supporting the requirements of the (CoR) Education and Career Framework.[2] Within this framework the principles of innovation and entrepreneurship skills are now a recognised requirement; therefore, the application of entrepreneurial behaviours, attributes and competencies is now a fundamental core skill of a radiographer.[2]

This article considers how a deeper understanding of an individual's own entrepreneurial attributes can foster a skilled, resilient, and adaptable workforce. Combining radiography with entrepreneurial expertise, using a framework known as LUCID, a new Imaging Centre at a University within the United Kingdom (UK) demonstrates the value that can be achieved through a deeper understanding of an individual's human capital.

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Key Findings

As highlighted by Susiku et al. (2024)[3] within a systematic review, there was a call for innovative methods in radiography education prioritising the alignment with industry and holistic skills development to improve graduate competencies. This narrative represents such a model of delivery and subsequent innovation.

To understand the relationship between radiography education and entrepreneurial skills, attributes, and behaviours, it is important to first define the relevant terms 'enterprise' and 'entrepreneurship' as defined by the Quality Assurance Agency (QAA, 2018, p.7)[4]:

- *"..,Enterprise: the generation and application of ideas, which are set within practical situations during a project or undertaking. This is a generic concept that can be applied across all areas of education and professional life.*
- *Entrepreneurship: the application of enterprise behaviours, attributes and competencies into the creation of cultural, social or economic value. This can, but does not exclusively, lead to venture creation..,"*[4]

Entrepreneurial skills and behaviours are defined in line with Lumpkin and Dess (1996)[5] and Zhao and Lumpkin (2010).[6] In 1996, these were noted as functions of an individual's propensity for autonomy, innovativeness, risk-taking, proactiveness, and competitive aggressiveness.[5] By 2010, they were refined to include conscientiousness, openness to experience, emotional stability, extraversion, agreeableness, and risk propensity.[6] Based on the definitions provided, entrepreneurship can be referred to as the application of entrepreneurial behaviours that add value. This value can be seen in terms of a better understanding of an individual's own accumulated skills and experiences, enhancing relationships, and improving education and student experiences. Within this article, value is described in terms of the cumulative impact of an individuals' knowledge, skills, talent, and experience. Reflecting on an individual's abilities within these parameters, this measure of value is termed Human Capital, which could be viewed as an individual's CV or resume, developed through continued professional development opportunities. As an individual, by understanding your own human capital, you can identify which skills and competencies you may need to enhance.[7]

Radiography is a dynamic and evolving profession that faces many challenges and opportunities in the changing healthcare landscape. One of the key drivers for radiography practice and education is the need to grow and develop the workforce, provide additional opportunities to increase skills for enhanced, advanced and consultant level practice, and meet the demands of patients and stakeholders.[2,8,9] To meet the requirement for higher education institutions (HEIs) to support both the future and ongoing development of the radiographic workforce, two academics from a UK university explored ways to enhance this workforce several years ago. One academic specialised in Radiography, while the other had expertise in Enterprise and Entrepreneurship. During their discussions, they considered how a framework could facilitate their conversation. This led to the utilisation of an existing, unpublished framework called LUCID, originally developed in 2015 by academics Clarke, A.P., and Deacon, J.C. The LUCID framework, which was an internal unpublished document within the University, guided the progression from problem identification to solution delivery through key stages: Listen, Understand, Co-design, Involve, and Deliver. It provided the Radiography academic with a systematic, holistic approach to identify and address the initial problem, generate and evaluate solutions, and communicate and share results.

Lucid

The LUCID framework served as a guiding tool in developing the new imaging facility, aimed at fostering a skilled, resilient, and adaptable workforce. The LUCID framework is presented for the first time within this article; Fig. 1 summarises the key outcomes from each stage.

When developing the case for funding and putting the building blocks in place for a new imaging facility, LUCID allowed the academic to better understand their own entrepreneurial behaviours and attributes and to reflect on their own accumulated knowledge, skills, talent, and experiences - their human capital. This human capital was noted by Clarke (2024)[7] to be of intangible value and included a combination of elements such as educational attainment, skills and competencies, work experience and training. By using LUCID, the academic in this example was able to recognise that, by identifying and changing the way an established educational practice happened, value could be added and an enhanced educational experience for the student could be offered. The academic reflected on their own human capital (their own accumulated knowledge, skills, talent and experiences) and then used the LUCID framework to highlight and identify the processes required to bring about a positive change in educational practice and develop the imaging facility.

The new imaging facility developed was a novel collaboration with an equipment provider for a state-of-the-art, multi-modality, multi-purpose facility that provides a realistic and simulated learning and working environment for students and staff. This state-of-the-art facility not only fosters an environment conducive to curriculum innovation and integration, but also serves as a cornerstone for skills development and enhancement. This aligns with the HEI's strategy to support the NHS by addressing workforce challenges[8] and enhancing the quality of healthcare provision.

The facility was designed to replicate a real clinical environment, complete with realistic scenarios, equipment, and protocols. It serves multiple purposes, including teaching, training, research, development, and service delivery. Open to students and staff from various disciplines and levels, as well as external partners and collaborators, it is managed by a dedicated team of radiographers, educators, researchers, and technicians who offer support and guidance to users. Already, it is positively impacting the education provided by the HEI, offering a platform for curriculum innovation and integration, as well as skills development and enhancement (Fig. 2).

The new facility provides a platform for radiographers to showcase their achievements and competencies, as well as to receive feedback through simulated activities. The facility also enables radiographers to obtain their enhanced, advanced and specialised skills, as well as to pursue further education and career development through continued professional development (CPD) events. It facilitates staff and students to engage with the wider community and stakeholders, and to promote the value and impact of their profession. Some examples of how the facility demonstrates new skills among radiographers are as a showcase site to demonstrate the imaging equipment and systems to employers, to collaborate with partners and networks on imaging research and development, and to support the imaging equipment provider to train staff.

The new imaging facility, and its entrepreneurial approach in design, have resulted in positive outcomes and impacts for radiography practice and education at the University of Salford, as well as for the wider community and stakeholders. Within the first year of opening some of the initial outcomes and impacts at the HEI include the following:

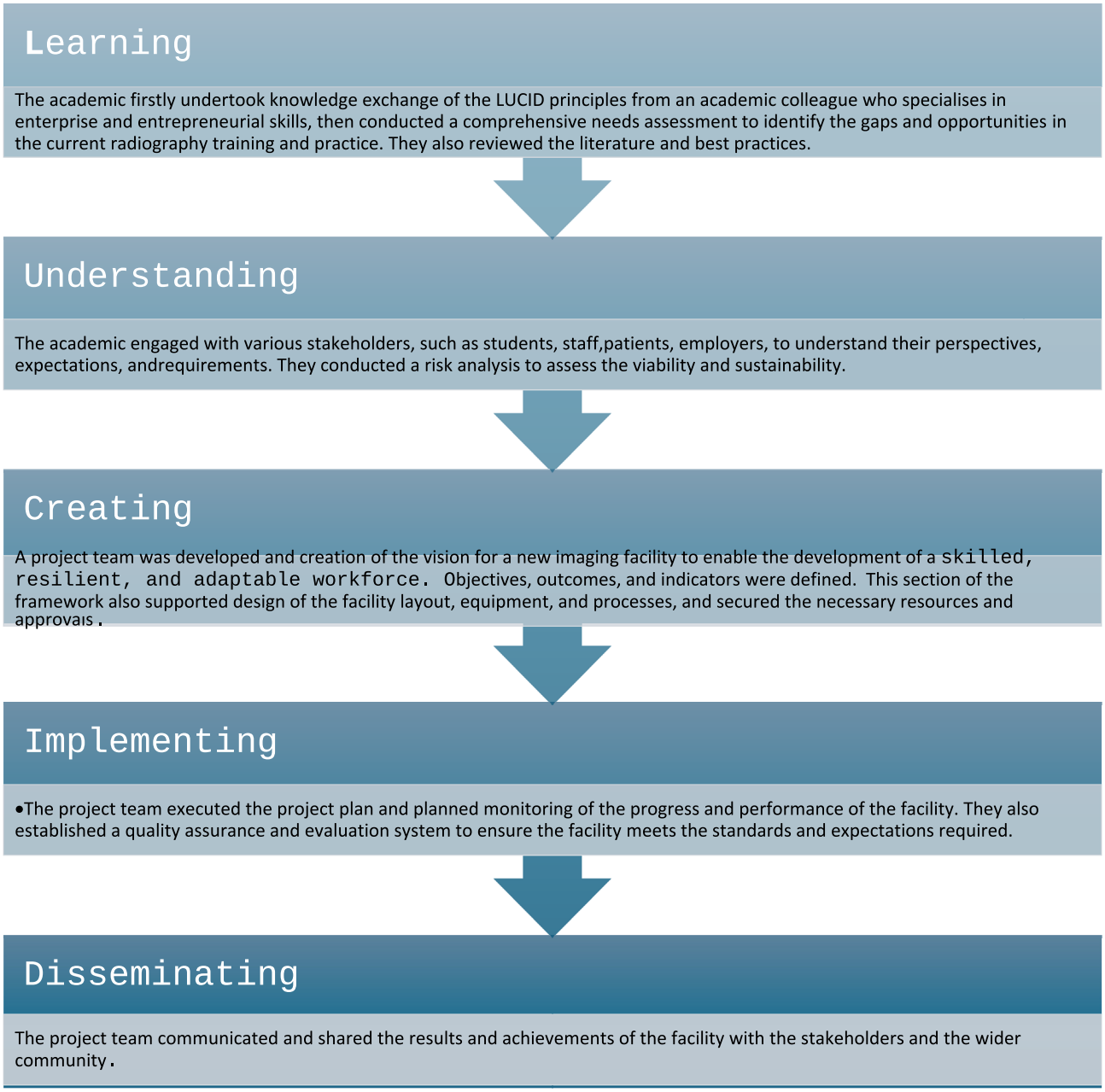

Figure 1. Use of the LUCID framework for development of the new imaging facility.

1. Expansion of Workforce Capacity and Capability: The imaging workforce within the region has seen a significant boost, with an increase in undergraduate student numbers from 72 to 100 per annum, over the period of installation and commission of this imaging facility. One key attraction to the HEI from the prospective students noted as being the Imaging Facility.
2. Imaging staff in the local region have enhanced their education through funded CPD courses by the North West Imaging Academy from NHS England (NHSE). Over the past year, 14 CPD sessions were held from the Imaging Facility, attracting 1200 attendees. These sessions offered valuable opportunities for professional growth and networking, both in-person and online. Feedback was collected immediately after each event via Microsoft Forms and used to improve future sessions as required. Attendees noted that these CPD sessions positively impacted their practice in the NHS, boosted their confidence, and that the environment at the Imaging facility provided a conducive environment for learning and networking.
3. Skills and Competency Enhancement: Imaging practitioners have improved their skills and competencies by attending training sessions at the Imaging Facility. These sessions, conducted by the equipment provider, took place before a piece of new imaging equipment was implemented within an NHS trust. This approach allowed for training in a relaxed environment, free from the pressures of patient activity.
4. Provision of Education and Training: the HEI staff team received hands on, face to face training to ensure that they can deliver high-quality provision through Undergraduate and Postgraduate programmes, further contributing to the development of a skilled and adaptable imaging workforce.

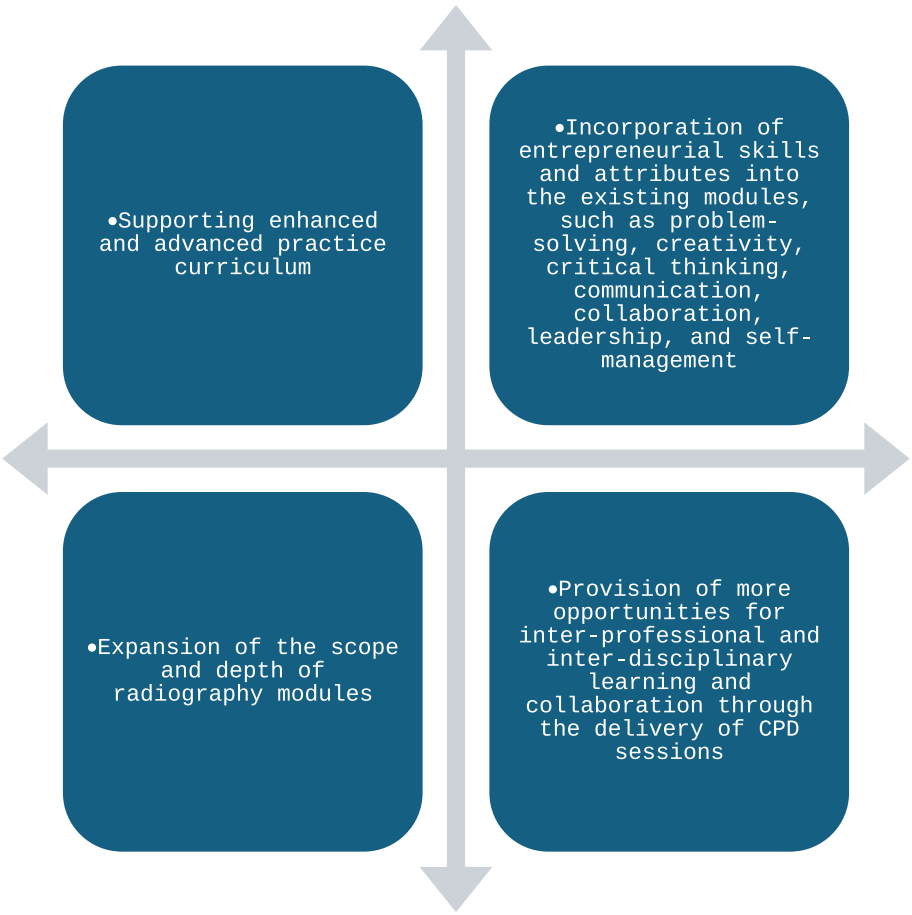

Figure 2. Impact on education of radiography workforce.

Conclusion

In conclusion, this paper has illustrated how entrepreneurial thinking and the application of the LUCID framework have guided the development of a new imaging facility at a UK HEI. The facility aims to enhance diagnostic and medical imaging while producing a highly knowledgeable, skilled, resilient, and adaptable workforce. We have explored how the facility and its entrepreneurial approach are being integrated into radiography education, contributing to the development of new skills among radiographers. By individuals having an enhanced understanding of human capital, and the relevance of those skills to the profession of radiography, a better understanding of personal value can be achieved - value that can be offered to the profession, employers, and patients.[2,7,9]

Implications for Practice

We hope this article inspires and encourages other radiographers and educators to adopt and apply entrepreneurial thinking and practices in their own contexts, sharing and learning from each other's experiences and achievements. Several areas can be focused on to develop an individuals' personal practice and that of others. Gaining a deeper understanding of one's accumulated knowledge, skills, talent, and experience can be a highly valuable asset. By recognising how opportunities are perceived, it can become easier to innovate and enhance skill levels. Reflection is crucial for personal development, particularly in understanding the breadth of accumulated skills and experiences. This process is similar to evaluating human capital, identifying strengths, and pinpointing areas for improvement to support the development of skills to enhanced, advanced, and consultant levels.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Co-Pilot in order to support with improving language or readability of the text. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Conflict of interest statement

None.

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