

ENHANCING 21st CENTURY INTERDISCIPLINARY DESIGN SKILLS WITHIN HIGHER EDUCATION THROUGH KNOWLEDGE TRANSFER PARTNERSHIPS

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ABSTRACT

This paper examines how Knowledge Transfer Partnerships (KTPs), a UK, part government-funded programme can be actively used to support curriculum development across design against the needs for new graduate knowledge skills, through greater collaboration, dialogue and understanding between academia and business. The paper discusses a recent KTP with a Scottish textile manufacturer where support in design innovation through the embedding of a recent design graduate within the company enabled diversification of their brand portfolio from the oil and gas market into the premium fashion market. The authors (the academic supervisor and the graduate designer) reflect and share – as a case study – the collaborative project, that led to significant insights into the needs of graduates when working within an interdisciplinary working environment across industry and academia. Further, the paper goes on to demonstrate that industrial contexts can be successfully replicated through knowledge exchange collaboration between business and academia to inform the curriculum against the graduate competencies and skills required within industry relevant to the 21st Century workplace.

Keywords: Design education, knowledge transfer partnerships, industry, interdisciplinary skills

1 INTRODUCTION

It is well understood that HE needs to nurture and equip students to become graduates able to navigate a highly competitive, complex and ever-changing 21st Century marketplace. The Higher Education Academy, the UK's professional membership scheme for HE, identifies 21st Century work skills as encompassing three distinct themes: literacies, competencies and character qualities [1]. Whilst Razzetti [2] refers to these as an adaptive mindset focusing around three key meta-skills of self-awareness, creativity and resilience and the *Partnership for 21st Century Skills* refers to the 4Cs – 'super-skills' – as Creativity, Communication, Critical Thinking and Collaboration [3]. It is around all these definitions that students need to develop their graduate attributes for sustainable employability throughout their working lives. Understanding this multi-faceted information, which defines contemporary graduate employability within the HE sector, [4, 5] will increasingly demand HE to acknowledge and support graduates to develop broader ranges of interdisciplinary skills to become resilient and adaptable within this evolving landscape [6]. These demands and challenges are particularly evident, although not limited to, the creative sector [7] with a statistically high level of self-employment, which is only set to increase in the future [5]. Lara Furniss in her paper *Beyond Discipline: Design Practice and Design Education in the 21st Century* [8] clearly points out education needs to better prepare design students for the challenges of future decades through re-examining current practice and alternative education models. More, within the context of fashion and textile design, the education report *Is Fashion Education Selling a False Dream?*, commissioned by the Business of Fashion [9], acknowledges that the increase in students undertaking fashion degrees is not being matched by the number of jobs. This mismatch will continue to be acute for graduates both during the post Covid-19 pandemic and its subsequent aftermath. Further, graduates are increasingly expected to proliferate and navigate across specialisms: digital and social innovation, social and sustainability issues, and new hybridised design and business models. Equipping students with these skills is a complex challenge and raises questions about traditional modes of delivery within design education. Universities should also, as Tonkinson states in his article *What Things to Teach Designers in Post-Industrial Times?* [10], lead industry with research-driven alternative

futures, as identified through this case study, to produce graduates not only of value to industry now but also having resilience and adaptability as the nature of work and society changes in the future. The creative subjects within art and design HE faces a further challenge where increasingly they are becoming subject to ‘value for money’ measurements by government agencies requiring evidence-based data to communicate their wider impact. The shifting models of graduate employment together with evidence-based metrics have a significant impact on the way we might seek to embed and develop these employability skills within our curriculum development. However, one effective mechanism which purposefully supports and facilitates increased levels of resilience and hybridisation, is the active development of external partnerships that provide students with relevant new knowledge skill sets and understanding within the evolving workplace context.

One of the key objectives of universities is to develop strong courses producing graduates that have excellent employability skills where they are adaptable and flexible and can use their transferable skills in several contexts. This requires universities to provide students with the knowledge skills as defined by Kolb’s four modes of experiential learning: concrete experience, reflective observation, abstract conceptualisation, and active experimentation central to building life-long learning capacities and employability skills as required within today’s society and workplace [11]. The paper examines these capacities and skills through the lens of the experiential learning gained by the recent textile design graduate who was employed during a 24-month (Feb 2018 – Feb 2020) industry project and referred to within the KTP structure and hereafter as ‘the Associate’. The paper draws on a mixed methods approach including the formalised documentations created during the project: the project plan, four-monthly interim management reports, the impact benefits log, and the final reports. Qualitative methods used also include captured reflective discussions between the Associate and the academic supervisor during the project period. The paper explores how, particularly for design subjects, universities can stay current and teach an ever-evolving practice and whether it is possible to replicate industry conditions in academia through KTP collaborations. The paper further examines the mutual benefits for both academia and industry of KTPs in providing experiential insights into the implicit interdisciplinary nature of commercial design, manufacturing applications and solutions. Final reflections are made on the benefits and opportunities for enhancing academic teaching, research and career progression for the Associate at the early stages of their career development.

2 COLLABORATION BETWEEN UNIVERSITY AND INDUSTRY

The UK government recognises the value of facilitating collaboration between universities and businesses through the KTP programme that has been running for over 40 years, supporting primarily small to medium-size enterprises (SMEs) to gain access to the academic expertise and resources available within the HE sector. Partnerships are formed between a company, a university and a graduate, who work together to deliver a strategic project for the business which the company would be unable to achieve without the knowledge and expertise provided by the institution [12]. Although KTPs are clearly about the transference of knowledge from one party to another, both Van den Bosch [13] and Lane and Lubatkin [14] argue that knowledge is exchanged fluidly backwards and forwards between the business and the university rather than as a one-directional transfer and it is the development of new knowledge that ultimately builds both competitive edge for the business but also experiential insights for academics on the requirements of 21st Century graduates within the future workplace [15]. The programme is designed to be beneficial to all parties. Academics involved in KTPs sited a range of benefits including a better understanding of the needs of industry (particularly effective for engaging with SMEs); generating case study material for research publications and teaching material; securing further funded research projects and staff skills enrichment through real world application; as well as raising the profile of the institution externally [16]. In fact, it could be argued that KTPs can enhance not only the absorptive capacity of businesses but also the dynamic capacity within the host university where new knowledge creation internal utilisation enhances both organisations ability to sustain competitive edge and relevance to 21st Century graduate careers development. Whilst the largest percentage of KTP projects are in partnership with engineering schools they have now been adopted by other disciplines including business and design schools, however according to data available on the KTP Portal only 4% of all KTP projects have been in collaboration with university design departments. As such there is limited data available on the success of design KTP projects (particularly within the fashion and textile design specialism) highlighted by Coulter who recognises that the qualitative measuring and empirical outcomes of non-scientific methodologies is distinctly different to those within the science disciplines

[17]. Reflecting on the experiences of the Associate working on the project provided a framework within which to assess the impact and benefits of the case study in relation to developing the skills needed for graduates within the 21st Century.

3 THE CASE STUDY

The case study reflects on a KTP within a Scottish (post-92) academic institution that has the best employment record of universities in the non-specialist Higher Education institution category in Scotland. The host company was a heritage Scottish textile firm based in NE Scotland, established in the late 18th Century originally making handcrafted products for the fishing industry. For over 40 years they have manufactured a range of bags, mainly for the oil and gas industry where they have a reputation for manufacturing functional and hardwearing industrial products. Their motivation for collaborating with the university was triggered by a recession in this sector where they had experienced a decline in profits. In partnership with the university's fashion and textile design department a collaborative opportunity was identified to facilitate the company's ambitions towards product diversification through the development of a new sub-brand specifically for the premium fashion market, a market unknown to the business. A recent graduate was employed as the Associate to act as conduit between the business and the university to undertake the role of project manager on a strategic innovation venture within the business where they develop rapid first-hand professional (technical, managerial and academic) skills. Here, where the company were inexperienced in using creativity and with no in-house design capability, the graduate employed had an educational background in fashion and textile design at both undergraduate and postgraduate level.

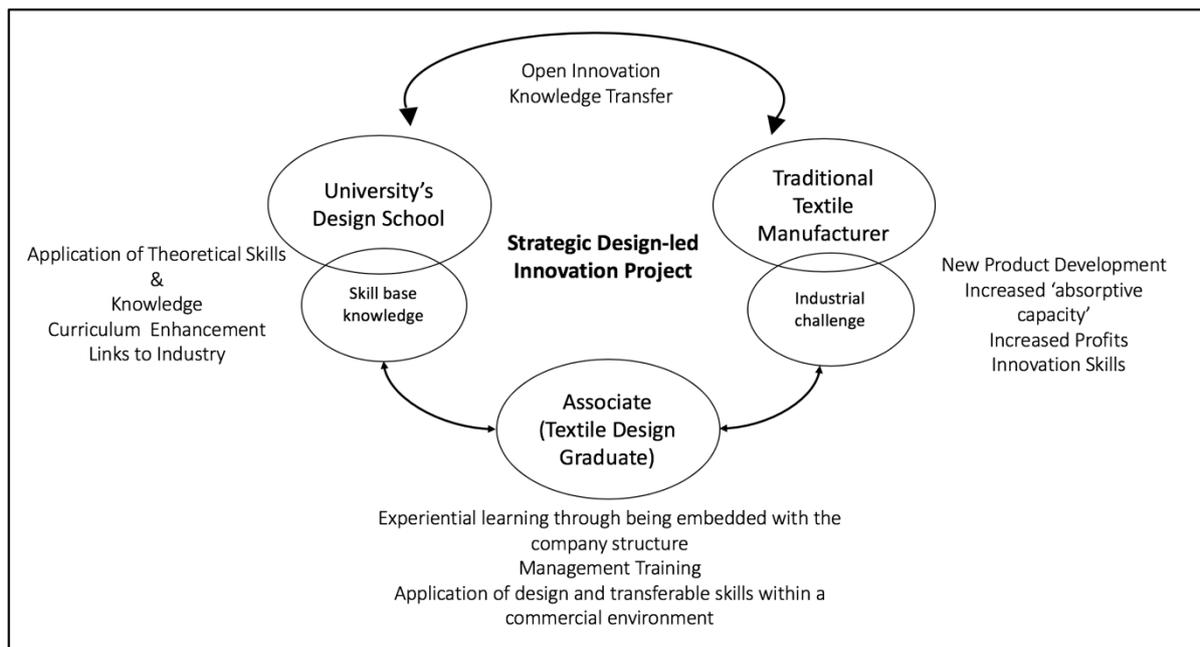


Figure 1. The Knowledge Transfer Partnership (KTP) structure and relationship between the parties

3.1 The role of the Associate

Designers are agents of change that go beyond designing products to becoming more adept at recognising how their multi-faceted transferable skills can be applied within innovation practices across a wider setting [18]. These transferable graduate skills, also known as peripheral skills [19] and the 'T-shaped' learner describe the ability to collaborate across disciplines with experts in other fields [5]. Industry needs creative workers that can collaborate, communicate and integrate activities and projects, where the designer's ability to be agile and responsive to new emergent lifestyle trends is attractive to industries that struggle to achieve this but know it is essential to their future growth. Introducing a designer into a non-design business presents challenges when they are the only person with a design education and background. Whilst demanding, this environment provides a unique opportunity for the

graduate to test out their design and interdisciplinary skills in new ways relevant to 21st Century design competencies framed by the 4Cs: Critical Thinking, Communication, Collaboration and Creativity [3].

3.2 The designer as critical thinker and creative director

External and environmental factors have contributed to a positive change in perceptions of design, with designers being credited with greater regard, however design and the value of design education is still misunderstood and many UK manufacturing businesses still fail to exploit the UK's design talent. A key objective for change in this case study was to embed a designer within a traditional manufacturer to demonstrate the benefits of design thinking that go beyond the perceived superficial understanding of design as the 'finishing touch'.

The role of the designer in this instance highlights the agency of design where the Associate has required a complex range of skills, where not only are they the creator of new knowledge for the company but also must navigate successfully between two different organisations, the company and the university, each with diverse priorities and objectives, where they must synthesise and develop knowledge appropriate to each party. For the company the designer needs to innovate and present design-led initiatives that transform their current operations to ensure a successful outcome that fully meets the expectations of the project. For the university they contribute to courses for example through mentoring students on placement and managing 'live' student briefs related to the project. Within research they support the academic to inform case study material. These activities within both organisations provide material where the tangible impact of new knowledge generation and application within an academic context is aligned to bringing benefits to the sector, users and the HE curriculum. The designer also needs to apply their existing skills through commercial project management, meeting performance objectives and undertaking a formalised personal and professional development and management training programme. Here their design expertise together with training enhances their understanding of management concepts to consciously understand how to apply their skills to strategic design management in a dynamic process with the overall objective of supporting a business with 'potential absorptive capacity' towards 'realised absorptive capacity' [20, 21, 22].

3.3 The designer as effective communicator and collaborator

Design's intangible qualities and less quantifiable assets need to be appropriately communicated and adapted within a company with no prior design understanding. For the Associate, taking on the role of stewardship, planning and managing a project involved developing nuanced oral communication skills to work effectively and sensitively with all staff with different roles and responsibilities. Specifically, this involved communicating with Senior Management (SM) to understand the project objectives from their perspective; communicating with the production team to understand their roles; and evaluating the existing systems already in place. As new processes and systems were developed as design innovation practices began, they needed to become embedded within the company through effective communication with SM to ensure full implementation across all stages of production was essential. Further, designing a new brand and product range needed to be clearly articulated across the company to ensure full buy-in, achieved by communicating and working with staff to guarantee complete understanding of the importance of new quality control assurance. In addition, the designer's taught visualisation methods through storyboards, visual references within presentations, illustrated reports and diagrammatic and videoed instruction manuals facilitated conversations and input from staff in new and accessible ways. As the Associate illustrates: *"Throughout the project I have collaborated closely with the company's management team so that everyone could learn and understand the new way of thinking necessary for new product development and innovation within the fashion industry. It was important to be as open as possible. Whilst researching I produced several reports with findings and directions, which we then discussed as a group. We all transferred ideas and learned from each other."*

4 DISCUSSION

Fashion and textile design education tends to focus on the traditional application of design thinking towards product development, however a key objective here was to explore interdisciplinary design skills within a traditional textile manufacturer that would not only develop new products and evolve a product design management framework but also develop tools and approaches that can bring systemic cultural transformation within the business towards their future growth. Therefore, exploring the interdisciplinary nature of commercial design contexts and the transferable skills of the Associate that

extended beyond new product design. As the Associate reflects on completion of the project: *“It has made me realise how important my design skills are and not just in the context of NPD.”*

Through collaboration formalised through the KTP programme the knowledge exchanged between all parties has deeply impacted both the university and has been fundamental to the successful outcomes of the project. The consistently regular contact and dialogue (usually fortnightly) between the company and the academics over a two-year period cemented a deep mutual relationship which continues after the project time.

Graduates’ experience of the KTP programme has been transformational for fast-tracking career progression, where 84 % are employed immediately on completion, with many being employed by the host company [16]. This is particularly significant within the fashion and textile job market where only one in seven graduates in the UK will find employment as designers [9]. When asked about their experience of involvement in the KTP matching up to expectations, the Associate commented:

“Being involved in this KTP has exceeded my expectations as it has provided me with amazing opportunities to develop myself as a person as well as professionally. I have continuously felt fully supported through the project and valued as a person as well as being valued for my design/innovation skills. Our project has been the catalyst for exciting business innovation, and it’s been really exciting to be a part of that and work alongside a team of like-minded people.”

5 CONCLUSIONS

The KTP project has now officially concluded where the impact and benefits of the collaboration are continuing. Due to the impact of Covid-19 the new product range currently on hold awaiting a viable time to launch. However, the sub-brand development has transformed the company’s understanding of the value of design for their future economic growth which they foresee as critical moving forward post Covid-19. Further demonstration of this is clear where the Associate has been employed by the company as Design and Brand Development Manager and as an Associate Lecturer for the fashion and textile department, ensuring future dialogue and collaboration between the parties. Further funding to develop another design led KTP with a Scottish heritage brand has been successful with the intention to further develop more evidence of the 21st Century design skills required to support the design graduates of the future.

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REFERENCES

- [1] Dibben, M. and Norton, S. *Embedding Employability in Student Programmes – It Starts with the Right Language*. Available: <https://www.heacademy.ac.uk/blog/embedding-employability-student-programmes—it-starts-right-language> [Accessed on 2020, 3 March] (2020, 3 March).
- [2] Razzetti G. *Stretch for Change: How to Improve Your Change Fitness and Thrive in Life*, 2017 (Liberationist Press, Chicago, US).
- [3] Kivunja C. Exploring the Pedagogical Meaning and Implications of the 4Cs ‘Super Skills’ for the 21st Century through Bruner’s 5E Lenses of Knowledge Construction to Improve Pedagogies of the New Learning Paradigm. *Creative Education*, 6, 2015, pp. 224-239.
- [4] Fullan M. and Scott G. *Turnaround Leadership for Higher Education*, 2009 (John Wiley and Sons, Chichester, UK).
- [5] Creative & Cultural Skills. *Building a Creative Nation: The Next Decade*. Available: https://ccskills.org.uk/downloads/CCS_BUILDINGACREATIVENATION_WEB_SINGLES.pdf [Accessed on 2020, 3 March] (2020, 3 March).
- [6] Bill K. and Bowen-Jones W. Enhancing enterprise, entrepreneurship and employability through PDP. In *Enhancing Graduate Employability in Business and Management, Hospitality, Leisure, Sport, Tourism*, 2006 (N Becket & P Kemp eds, Threshold Press, Newbury, UK).

- [7] Faerm S. Towards a future pedagogy: the evolution of fashion design education. *International Journal of Humanities and Social Science*, 2012, 2(23). Available: http://www.ijhssnet.com/journals/Vol_2_No_23_December_2012/24.pdf [Accessed on 2020, 3 March] (2020, 3 March).
- [8] Furniss L. *Beyond Discipline: Design Practice and Design Education in the 21st Century* Available: https://thead.ac.uk/wp-content/uploads/2015/11/BeyondDiscipline_web1.pdf/ [Accessed on 2020, 5 March] (2020, 5 March).
- [9] Business of Fashion, Report. *Is Fashion Education Selling a False Dream?* Available: <https://www.businessoffashion.com/articles/education/global-fashion-school-rankings-2015/> [Accessed on 2020, 5 March] (2020, 5 March).
- [10] Tonkinson C. *What Things to Teach Designers in Post-Industrial Times?* 2015 Available: <https://www.epicpeople.org/what-things-to-teach-designers-in-post-industrial-times/> [Accessed on 2020, 5 March] (2020, 5 March).
- [11] Kolb D. *Experiential Learning: Experience as the Source of Learning and Development*, 1984 (Prentice Hall New Jersey, Englewood Cliffs).
- [12] UK Government. *Knowledge Transfer Partnerships: What They Are and How to Apply*. Available: <https://www.gov.uk/guidance/knowledge-transfer-partnerships-what-they-are-and-how-to-apply> [Accessed on 2020, 5 March] (2020, 5 March).
- [13] Van den Bosch F.A., van Wijk J.R. and Volberda H.W. Absorptive capacity: antecedents, models and outcomes. Erim Report Series, *Research in Management*, 2003 (Erasmus Research Institute of Management, Rotterdam).
- [14] Lane P. and Lubatkin M. Relative absorptive capacity and inter-organizational learning. *Strategic Management Journal*, 1998, 19, 461-477.
- [15] Fosfuri A. and Tribó J. Exploring the determinants of potential absorptive capacity and its impact on innovation performance. *Omega*, 2008, 36(2), 173-187.
- [16] Warwick Economics and Development. *The Impacts of KTP Associates and Knowledge Base on the UK Economy* 2015. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/467142/KTP_Report_July_2015_Exec_summary__1-SEP-15_.pdf [Accessed on 2020, 5 March] (2020, 5 March).
- [17] Coulter J. *Interdisciplinarity: Creativity in Collaborative Research Approaches to Enhance Knowledge Transfer*. 2013. Available: https://pure.ulster.ac.uk/ws/portalfiles/portal/11303508/COULTER_Interdisciplinarity_in_knowledge_Transfer.pdf/ [Accessed on 2020, 5 March] (2020, 5 March).
- [18] Van der Marel F. and Mäkelä M. Designers as change agents. In T Björklund and T Keipi eds, *Design+ Organizational Renewal and Innovation Through Design*, 2019, pp. 102-115 (Aalto University).
- [19] Taflinger L. *Transferable Skills for Design, Creative & Cultural Skills*, 2013. Available: <https://ccskills.org.uk/careers/blog/transferable-skills-for-design> [Accessed on 2020, 5 March] (2020, 5 March).
- [20] Zahra S.A and George G. Absorptive capacity – a review, reconceptualization and extension. *Academy of Management Review*, 2002, 27(2), 185-203.
- [21] Mowery D.C. and Oxley, J.E. Inward technology transfer and competitiveness: the role of national innovation systems. *Cambridge Journal of Economics*, 1995, 19, 67-93.
- [22] Cohen W.M and Levinthal, D.A. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, 1990, 35, 128-152.