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FUTURE WORK SKILLS RESPONSE: A TEACHING TRANSFORMATION USING AGILITY AND EVIDENCE

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Hilary Collins has a PhD in Strategic Design Management from the University of Strathclyde, UK. Her professional career specialised in international business start-up in the field of design. Within her academic career Hilary has extensive experience of course development in Europe and the Middle East particularly for the creative industries. Her book, *Creative Research* has been translated into 5 languages and a 3rd edition will be launched in early 2023.

Hilary's main research interests are in creativity and creative facilitation and its value in both employability and furthering solutions of macro environmental 'wicked problems'. Most recently, research projects have included investigating sustainability and social innovation alongside the role of design thinking within strategic design management. Her research is also based within Teaching and Learning examining how the digital arena is impacting the academic role in Higher Education with a particular emphasis on academic identity. Hilary also teaches Contextual Research, Strategic Management and Change, Creativity, Innovation and Design Thinking.

Abstract

Employers are faced with multiple challenges in the workplace, managing and resolving complex problems in the context of a rapidly changing world. As the workplace, and the nature of work becomes more uncertain, we need to develop a rich and diverse skill set amongst employees, to enable them to effectively engage with these challenges.

Universities have recently positioned themselves in competitive markets, via a variety of selling points including employability, or cost-effective quality provision. These economic strategies have accompanied recent expansions in online delivery options facilitated through technological enhancements. New media platforms and 'marketised' ideas for delivering pedagogy and assessments have resulted in a proliferation of digital equivalence 'solutions' to traditional face-to-face or blended teaching approaches. This process was exacerbated by the COVID-19 pandemic which forced university teaching academics to produce online provisions

for existing degree curriculum. However, the response to employers and employees' needs for digital transformation has been slower, mainly because the impact on work skills requirements for the future, post pandemic, was unclear as organisations fought for survival in these turbulent times.

We describe how a leading blended learning university, reputed for large scale generic course, responded to this need by supporting an in-house project team to develop a range of bespoke online short courses. We detail the learning design approach, accommodating the constraints COVID-19 had on face-to-face meetings while applying both design and systems thinking. The team developed online creative workshops with industry stakeholders to uncover the work skills deficit and leveraged this learning to co-create, develop, and launch online short courses which responded to employers' specific skills development needs. The paper contributes to teaching and digital transformation by illustrating a holistic learning design process using a combination of design and systems thinking providing an enhanced user experience design in a digital environment.

Keywords: digital transformation, online course development, design thinking, systems thinking,

1. Introduction

This paper details how the project responded to an increased need by organisations for bespoke online learning, rather than converted from face-to-face learning materials; which is academically robust, while also being proactive to organisational future of work needs. Design thinking and systems thinking was used because it could be adapted to be used in a digital environment ensuring the research and development process was collaborative with stakeholders and was creative and efficient.

In the aftermath of the pandemic, Manyika et al. (2021) discussed emerging evidence from companies suggesting that technology adoption and other workforce shifts could accelerate. In the face of this evidence, we explored ways of unearthing more subtle qualitative data and insights about these needs using 'thick description' a term coined by Geertz in 1973 advocating that the researcher immerses themselves within the context. This was further developed by (Shenton 2004) to convey the importance of the actual situation and context. This concept underpinned the rationale of using both design thinking and systems thinking in the research design.

The development of sophisticated digital technologies provides an opportunity for universities to improve the creation of industry relevant courses. Munro (2018) discussed how digital technologies are presented to open UK higher education, and to respond to learners needs but also highlighted that this can also be contributing to this due to their homogeneity, as well as their tendency to focus on vocational provision. However, this also must be framed against what Munro (2018) summarised as higher education being an actual product and that the emphasis on this personalised learning approach and the incentive that the use of digital technologies in course provision can result in both cost savings and having a wider reach to a global market and in addition providing more choice to the student. Munro went on to discuss how this situation was flawed and that neither the 'marketisation' of education nor the introduction of digital technologies improved quality.

With this damning statement looming forefront it remained the focus of this project to focus on the changing innovation needs of both the learner and employers and to improve learner experience.

2. Context

The research design for this project used qualitative data collection and using what Collins, (2018) suggested; for the research to be credible we need to understand the context. The context of this project is set within a UK university which is one of the leading and largest providers of generic blended learning courses. Their process for curriculum development is in the simplest terms a reactive process assessing the market and measuring opportunities with 'google hits' on key terms with an overall development time of two years to market. Historically the reasons for this long development time concur with Williamson, Eynon and Potter (2020, p. 111) who suggested that there is no simplistic approach to mapping what has been face to face course material into an online delivery and that we cannot 'escape the essential disjuncture between what is possible and what is impossible under these circumstances, no matter how many times parents and/or educators are told that it is easy and that the 'digital' makes it so'.

In this context, we were tasked with developing a proactive, rapid business creation approach to solving existing and forthcoming challenges for learners in the workplace or aspiring to be in the workplace. The university recognised, as discussed in Collins et al. (2022, p 1.) that 'new media platforms and 'marketised' ideas for delivering pedagogy and assessments have resulted in a proliferation of digital equivalence 'solutions' to traditional face-to-face' or blended teaching approaches'. The university management also realised that existing longer lead times to course launch have meant course material may be outdated before the students are enrolled.

We aimed to overcome these challenges by developing continuing education courses that meet and exceeds the needs of both user and stakeholders, with a sustainable business model in support. In agreement with Williamson, Eynon and Potter (2020) that we would need to manage 'unrealistic expectations' (see p.112) and that the project would be both problematic and complex we knew we would not be creating the same courses, or materials that would have been used in a face to face or blended learning situation. We adapted existing design and systems thinking processes to enable 'knowing' as quickly, cheaply, and effectively as possible by seeking to prove or disprove the accuracy of the critical assumptions being made about the levels of desirability voiced by potential users and industry stakeholders as well as being within the viability of the supporting business model. Our course development project set out to offer new thinking on how both the development team, including both academic and learning design staff, and stakeholders can adopt a different and more creative approach to explore difficult problems around upskilling and reskilling. It sought to demonstrate that through in-depth user research and using creative and innovative thinking, sustainable innovation development is possible.

In the middle of the initial research for the course development project, in March 2020, the COVID-19 pandemic hit. During the review and planning process that followed, the team recognised that the need for creative problem-solving in course development was exacerbated as organisations and employers wrestled with the 'new normal' of remote working, furlough and all the impacts on business brought about by the pandemic. We had planned face-to-face research workshops with industry and stakeholders and the challenge was then how to deliver all the benefits of face-to-face through an online digital platform. Whilst it meant the team had to adapt the project to online delivery, in many ways, it intensified even further the

need for a rich and diverse new skill set within organisations to enable them to be prepared to engage with the challenges ahead, in a COVID-19 and a post pandemic world. The results of this were that creative workshops which were part of the research design to underpin the course development project had to be adapted to be undertaken online using a combination of Microsoft teams and Miro. The understanding and insights we gained from these online workshops was used in the course development process.

Some universities now entering the online course development market start the creation process from the technology feasibility perspective, by asking ‘what can we build?’ or ‘how do we create something from this new technology?’ They start with a new enabling technology and design new ways of implementing it (usually at great expense), only to find that nobody cares, wants, or is willing to pay for a new technology solution that is far removed from their context and specific needs and problems. They fail to address the desirability of their solutions by first fully understanding the needs and problems of their learners and stakeholders and then start to evaluate the proposed solution to see if it solves them in any way. In other words, they take a *product-centric approach*, rather than a *human- or user-centric approach* as outlined by Tim Brown (2008) and illustrated in Figure 1.

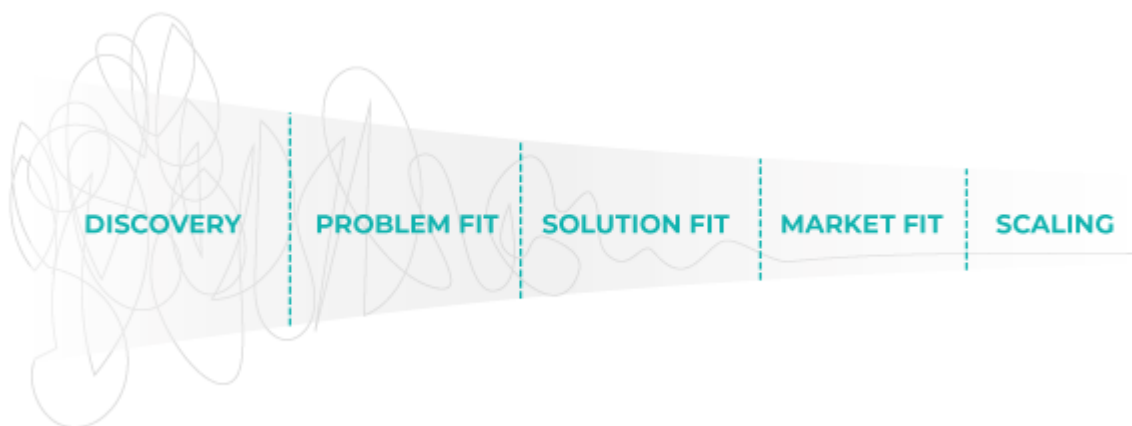


Figure 1: Process of course development research and development.

We decided there was no point in developing or deploying a new technology-driven solution or developing a complicated and untested business plan that may not hold true and embarked on the consideration of a human-centred approach. The next section details our theoretical framework.

2.Theoretical framework

Berger and Luckmann (1991) viewed knowledge as created by the interactions of individuals within society and this is what is central to constructionism (Schwandt, 2003). Berger and Luckmann (1991) proposed that it is conversation between people that is the most important way to maintain, modify and reconstruct subjective reality. Subjective reality can be shared with others because there is that shared meaning and understanding, and this means we do not need to redefine these meanings each time they are used and that they eventually become reality for us and are taken for granted. This is a social constructionist framework, and we

concede that there has been criticism against it because research using a social constructionist framework can lack an ability to change things because we cannot compare the findings against anything or make recommendations (Bury, 1986) making this an issue with method. The weaknesses of this approach were explained by Burningham and Cooper (1999) who maintained that this arises because researchers adopting this approach do not compare alternative arguments against an objective reality but rely on developing a convincing argument and then do not argue that their results are definitive. This is, however, consistent with the idea in constructionism that the findings of research are one of many discourses. The suggestion here is that far from being neutral, social constructionism is not neutral and can generate real debate and in consequence lead to change. The theoretical framework used in this project integrates the underpinning of social construction with the tools of design thinking. Liedtka (2018, p.2) explains design thinking as taking a different approach by ‘identifying hidden needs by having the innovator ‘(or course designer in this case) ‘live the customer’ (or learner) ‘experience’. We combine this with systems thinking which after discussing a wide variety of definitions for systems thinking Arnold and Wade (2015, p.678) defined it as having ‘ a clear goal, elements of systems thinking, and descriptions of interconnections between these elements’, challenging the duality of quantitative/qualitative and subjective/objective by focussing on the complex relational achievement which is required to construct a situation where different relational (research) processes construct different realities (knowledge). We then assume that all truths are valid in their context, are co-created in a specific time and are useful in that specific context.

Using this perspective led to the development of a problem statement, opportunity statement and an overall umbrella question which we used to guide the project.

2.1 Problem statement

The impact of the pandemic in conjunction with rapid digital and A.I. developments has resulted in a profound change in the type of job skills that are and will be in demand. With the impact of demands on personal time and the need for employees and entrepreneurs to reskill or upskill with industry relevant knowledge and skills, and with anytime-anywhere connectivity, employees and entrepreneurs realising they need to upskill or reskill rapidly are now expecting the same supply on demand modern interface experience with their career development that they have become accustomed to in their personal lives.

This resulted in an opportunity for the course development team.

2.2 Opportunity statement

To create a compelling flexible online learner experience for employees and entrepreneurs in continuing professional development that is informed by the future needs of industry and society.

This gave us an overarching question to respond to:

2.3 Umbrella question (or how might we?)

How might we use our course development and learning design expertise to create a compelling innovative flexible online learner experience with professional development courses as a response to driving changes in industry's' job skills requirement needs?

In working toward developing responses to these problems and statements, we drew on recent literature to understand learners and industry needs in terms of teaching and digital transformation and the process of design and systems thinking.

3. Literature review

3.1 Teaching and digital transformation

The university habitually used a fixed learning design method, and this involves the learning design team making decisions about the type of academic content which will be developed. Other academics who are not part of this initial design process are then tasked with writing set pieces on certain topics. This learning design method was devised to try to speed up the course development process. This practice concurs with finding from Crites and Ryes, (2020) who also cited Usma (2009). This practice has a negative effect on academics trying to develop courses within these constraints (Aboites, 2010). Crites and Ryes (2020) explained that separating the context of teaching from the learning design process creates a gap between what the course is designed to achieve and the reality of the teaching context.

This practice can result in all stakeholders becoming disconnected with the process both from a professional and education perspective (Crites & Ryes, 2020; Troudi & Alwan, 2010). This also means that academics are not involved in the discussions of what education technology and digital transformation tools are available and how they can be used to in course development to engage students in their learning (McKinney et al. 2015).

Although in contrast there is now a trend, which recognises these difficulties and that is integrating technology with the aim of improving the learning experience (Puentedura, 2010). COVID-19 brought about a sudden shift from a face-to-face teaching situation to academics having to convert materials to an online format without having the necessary training or pedagogic foundation (Rapenta et al. 2020). They went on to discuss how academics who are required to upskill quickly to embrace this digital transformation can experience increased levels of stress. This concurred with the finding of this project team who were required to shift from a blended to a digital approach within days of COVID-19 restrictions being enforced.

3.2 Systems thinking and Design thinking

To overcome some of these issues we involved both academics and learning design staff as well as stakeholders and potential learners in the team and started by understanding the unmet needs in the discovery stage of the project by uncovering problems and challenges facing our potential learners and stakeholders. Following Shenton (2004, p.64) who quoted Dervin et al.(1966) who described asking invited participants to reflect on situations, 'where you needed help. . . where you didn't understand something. . . where you needed to decide what to do. . . or, where you were worried about something' and like our participants Dervin stated 'our participants then described in detail a particular instance within one of these categories'.

We investigated using a combination of two different perspectives on making change: a system thinking approach and a design thinking approach. A systems approach looks at problems and potential solutions through the lens of a wider environment. Systems thinking has been defined by Checkland as ‘the process of thinking using systems ideas’ (1999, p.8) . Checkland (1999) proposed that systems thinking included four ideas which are making distinctions, organizing systems, recognizing relationships, and taking multiple perspectives and that these ideas describe the concept of the adaptive whole. In 1981 Checkland found that what usually made the systems problematic in the first place was the inability to define objectives precisely. This was because of the changing multiple, ambiguous and conflicting alternatives. He proposed that a solution could be purposeful action in human affairs and by treating a linked set of activities which constitute a purposeful whole as a human activity system. Systems thinking is then an approach to analysis that focusses on how the different parts of a system interrelate and how systems work within the context of other, larger systems. It is a holistic approach that can be used in many areas of both business design and research.

De Langhe et al. (2017) concluded that the exclusive reliance on traditional linear thinking is not always appropriate suggesting the need for systems thinking. They proposed that systems thinking may be particularly useful where organizations expand their strategies to nonmarket contexts where actors do not follow the conventional win-lose logic, their decision outcomes are uncertain, and their influence cannot be easily predicted. If we identify and map the elements of ‘things’ within a system to understand how they interconnect, relate and act in a complex system, and from here, unique insights and discoveries can be used to develop interventions, shifts, or policy decisions that will dramatically change the system most effectively.

In the design thinking process an iterative approach is used involving both design and testing alongside the further search for insights from users (Brown, 2008; Collins, 2013). The design thinking process starts with understanding users’ desirability in the problem fit stage and then honed down to develop solutions and evaluate market fit. This is a human and user centred methodology. Design thinking, explained by Brown (2009) and ‘is a human-centered approach to innovation. It draws from the designer’s toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.’

When considering the meaning of the term ‘design thinking’, Collins (2013) used the descriptors proposed by Cross (2011): that design thinking is emergent, intuitive, abductive, reflective, ambiguous and co-evolutionary. We may not understand a design problem without immersing ourselves in its exploration and development. In other words, our ideas help us understand the ideas our problems seek to address. Conversely, we need to understand something of a design problem before we can bring our creative and systematic design thinking to bear. The design problem and the design solution evolve together.

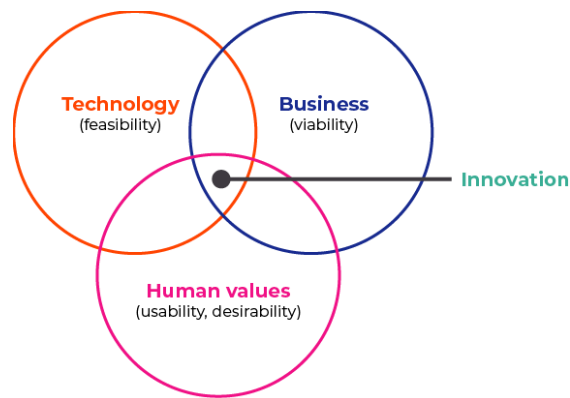


Figure 2: Feasibility, viability and usability (Brown, 2008)

The above diagram (Brown, 2008) represents the approach to human-centred design, which is a creative approach to problem-solving. As described by Brown (2009), design thinking encompasses three aspects: desirability, feasibility, and viability. The goal of desirability is to fully understand the problems within the organization by asking what people are “hearing and seeing and feeling and thinking.” This process of identifying the “deeply felt needs” of various stakeholders is sometimes referred to as human-centred design or empathy. The second aspect—feasibility—requires stakeholders and planners to look at what is possible in the organization in terms of existing and potential capacity, human resources, processes, and technology. Finally, the third aspect is viability, which requires us to consider how a change can be implemented and sustained over time.

Design thinking takes a holistic view by focusing on innovating and creating products and services that solve problems. By contrast, human-centred design is more concerned with improving usability, the extent to which defined users can achieve specified goals, or the user experience of a product or service (the user’s perceptions of the use of the product or service). Both design thinking and human-centred design start with the people who have a problem and end with new solutions that are designed to fulfil their needs. As such, design thinking and human-centred design can be used in tandem or as a phase of a project.

Design thinking is a specific and thoughtful process for identifying the problems within a system and for developing potential solutions. It is based on the simple premise that the people who face the problem every day are most likely the ones who can hold the insights to the solutions. It is critical to think about how an initiative can be embedded into the organisation, so it has a higher likelihood of continuing long past the point of implementation. Desirability, feasibility, and viability describe the issues to be discussed during a design thinking process and the resultant overlap illustrates where ‘innovation’, in this case through course development, can take place.

To summarise, there are differences between design thinking and systems thinking which makes their combined use in this case study pertinent. Design thinking is a systematic and repeatable methodology designed to solve problems by framing end users and consumers, or in this case stakeholders, at the centre of the problem-solving process and generating rapid prototypes to test and validate new ideas. Systems thinking is a holistic approach to analyse and solve constituent parts of existing systems and how they function over time, often applied to challenges like wicked problems (a social or cultural problem that is difficult or impossible

to solve due to its complexity and interconnected nature). This combination allows the researcher to understand the drivers in the overall system and understand the needs and want of potential users and stakeholders.

Considering these issues, this paper explores how integrating design thinking, a human-centred and a problem-solving approach and systems thinking can be used to improve online learning course design focussing on collaboration and innovation while avoiding a top-down management process. Using an exploratory case study design, three questions were set to guide the research and led to insights on designing industry relevant courses with a positive student user experience.

- 1 How can digital transformation be used to develop professional development courses that address the future of work skills deficit?
- 2 How can Design Thinking and Systems thinking be used to inform digital online learning course design?
- 3 Can the process of online learning course design be enhanced by incorporating design and systems thinking?

4 Research Design

In this section, we will describe a learning, research and development framework that draws upon our research and experience, and that of others, in creating online courses. The course development team planned to research and develop short courses in response to reskilling and upskilling requirements highlighted in industry reports from McKinsey (Chong et al. 2020), particularly focussing on jobs at risk due to COVID-19. Primary research was undertaken using creative qualitative workshops. We followed (Pourdehnad et al. 2011, pp. 7–8 in Pohl et al. 2020) by adopting “an integrated approach to problem resolution requires design thinkers to expand their understanding of good systems design principles with a purposeful consideration of the social systems they are working within.” We combined both design and system thinking practices at the heart of the process and used both methods to frame the initial problem and to develop solutions as illustrated in Figure 3.

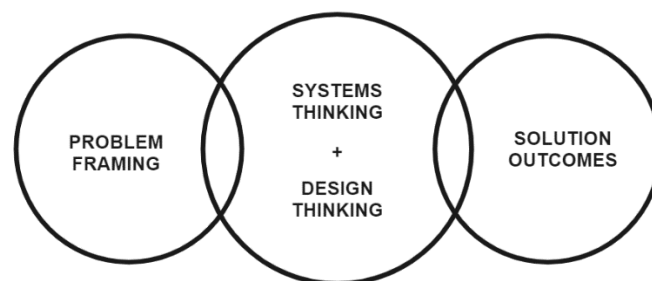


Figure 3: Systems thinking integrated with design thinking to understand problems and arrive at solutions

We obtained internal university funding to undertake in depth qualitative creative workshops with mid and senior management across COVID-19 affected industry sectors, notably hospitality and retail, within our four nations in the UK to work with them to gain insights into their reskilling and upskilling requirements focusing on the nine future work trends. After starting with a system thinking approach to map out the system and its boundary, we used a six-stage design thinking process to organize our fact finding and decision making: (1) Empathy, (2) Define, (3) Ideate, (4) Prototype, (5) Test, and (6) Launch as illustrated in Figure 4.

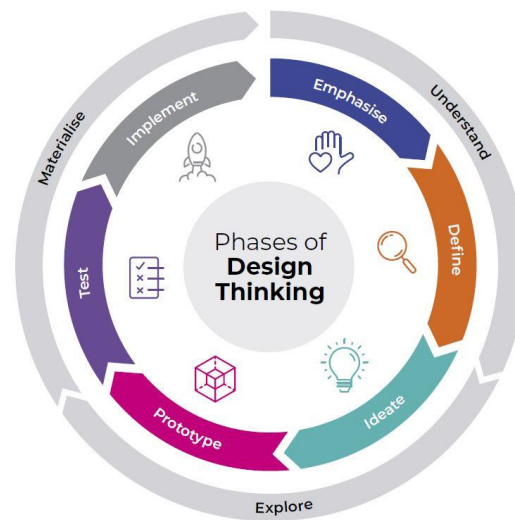


Figure 4 : Six stages of design thinking

The team researched and then became skilled in the use of a visual collaboration tool, Miro. An innovative workshop space and design and systems thinking process was created and built on Miro, and workshop participants were familiarised with the platform in advance of the sessions. The initial workshop programme took place in late 2020 and early 2021 with participants who were a mix of stakeholders from hospitality and tourism along with some of their partners and network contacts alongside academics and support staff. The workshops initially led participants through the design thinking process by working collaboratively on a series of innovative exercises, and skilled them up on using the tools.

The process itself, can be described in the three overall phases of inspiration, ideation, and implementation which fit into the six design thinking stages.

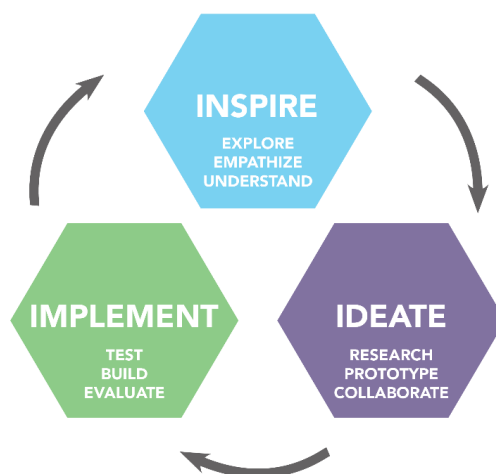


Figure 3: Inspire implement ideate (adapted from Brown (2009))

In the inspiration phase, perspectives from all stakeholders are gathered through methods including literature searches, individual and group interviews, listening, observation, and shadowing. In the ideation phase, stakeholders brainstormed and discussed potential solutions, in a creative and welcoming environment using Miro online whiteboards. Once ideas were identified, they were developed into proposals, and these were used to test prototypes online using social media. Rather than trying to perfect an idea before implementation, we used a design thinking design thinking iterative process of testing and refining to find a solution that works for all stakeholders.

The process we used for identifying problems and solutions for the course development project resulted in us inviting stakeholders to work together in a ‘virtual’ room with the course development team. We invited participants who actively engaged in identifying the problems and gathering insights on future work skill requirements to ensure as much as we could that the resulting solutions were the product of a collaborative, thoughtful, and iterative effort from various perspectives. In our workshops we achieved this by talking to stakeholders about the boundary of the system itself and then their own role in the system (Crosby et al. 2018, p.120). We then requested stakeholders to interview other users (learners) and stakeholders in in the system and feed back to the group. We also modelled the system’s dynamic (Crosby et al. 2018, p. 125). Then we asked stakeholders to analyse how their decisions “affect the broader community and the global system” (Nagel et al. 2017, p. 1614) in Pohl et al. 2020) in, for example, by using various techniques including drivers and hurdles.

Our methodology detailed how and when to switch between both ways of thinking and how to interconnect them. (see Table 1) . The steps numbered on the left-hand side of the table illustrate the iterative process of the workshops moving between systems and design thinking. This meant that the three systems thinking stages were used in step 1,5 and 7 of the collaborative workshops.

STEP	SYSTEMS THINKING	STAGES	WORKSHOP and TOOL
1	Researching the continuing education / industry system in C-19	SYSTEMS THINKING STAGES	Workshop 1 Iceberg model, uncover influence by mapping the system

5	Developing a systems model		Workshop 4 Surface issues for change
7	Checking solutions against the system		Workshop 5
	DESIGN THINKING	DESIGN THINKING STAGES	DESIGN THINKING STAGES
2	Identifying user insights through empathising	Empathise	Workshop 1 Hopes and Fears 5 W's and H User diaries
3	Identifying stakeholders and user types	Define	Workshop 2 Creating personas Problem and opportunity statement HMW umbrella question Stakeholder Value Maps Drivers and Hurdles
4	Ideate	Ideate	Workshop 3 Scenarios Solution Storyboard I like, I wish, what if
6	Reviewing concepts		Workshop 5 Drivers and Hurdles
8	Prototyping curricula solution	Prototype	Workshop 6 Prototype (out with workshops) Customer journey map Market opportunity sizing Business model creation
9	MVP testing	Test	Test Feedback loops Feedback capture
10	Evaluate, iterate then launch	Launch	Launch

Table 1: Stages in workshops

The workshops were designed with the aim of gaining insight on the impact to these organisations of the nine key future trends proposed by Gartner (2023) and what skills development needs they foresaw. We undertook a series of six online workshops line with organisations based across the four UK nations. We included stakeholders from one SME (small to medium sized enterprise) and one international company who were in the hospitality and retail sector from each of the four UK nations. We also co-created solutions to the format and delivery of these training needs in the workshops. The initial key issues were:

4.1 Supporting the workforce and operating structure at industry level (Workshop 1)

The workshop aimed to uncover how the social contract with workers changed and whether the industry sectors have the right operating structures and alliances in place to deliver their plans. We needed to identify and plan what skills may be required to make any necessary changes. The key considerations were social distancing and other new practices and regulations which have dictated changes in work, the workforce, and the workplace—the most prominent being the widespread shift to remote work and consideration of whether certain of these changes should or will become permanent. We also aimed to determine whether outsourced capabilities were sufficiently diversified or whether they need to be reconsidered. The anticipated uneven reopening of markets and geographies added an unusual amount of complexity to this analysis.

We started by mapping the education system. This included nodes which represent parts of the whole, mental objects or containers that describe who, what where and when of the system. We drew in links to represent connections between nodes that can illustrate relationships, flows of information or material. Together, nodes and links created a model of the system. Then, when this was agreed upon by participants we jumped across from a systems thinking approach to a design thinking approach using the ‘empathise’ stage and undertaking a range of online exercises with participants to discover their ‘hopes and fears’ for the future of work and to compare this with ‘user diaries’ we had asked them to write about their experience of work during COVID-19 and asking them to reflect on their future upskilling and reskilling needs.

4.2 Managing stakeholder expectations (Workshop 2)

In this workshop we focused on asking if social and institutional expectations had changed? The key considerations were that employers and stakeholders have become acutely aware of their responsibilities and of their contributions to the financial, physical, emotional, and digital well-being of management, employees, investors, and other stakeholders. We aimed to examine the insights generated by stakeholders and tried to understand them and to focus on their needs. We considered the problem to be wide reaching exemplified by ‘wicked problems’ (Rittel and Webber 1973). We talked with stakeholders about whether an issue is seen as problematic in the world of work and whether a measure to address it is considered positive or negative. This depends on the needs and interests of those who look at it, and these needs and interests vary between stakeholders and users (learners). We also reached out to a range of people working in different industries to find out what their problems were in relation to their career aspirations and progression. This gave us the pain points for a range of professionals in relation to their own career aspirations and enabled us to develop a range of personas. A persona is a fictional, yet realistic, description of a typical or target user of a product or service. The more generalised pain points were those that have resulted from the impact of the pandemic, A.I. and the rapidly evolving digital era. We also uncovered issues around the accessibility of learning for people who are time poor, are impacted by changes in job skill requirements who need specific types of knowledge development and skills acquisition, delivered with a flexible approach that is accessible to potential learners through different platforms and at times that are convenient to them.

Using this problem-based approach within the define stage and working with data collected from stakeholders and our range of personas we then then developed a problem , opportunity statement and umbrella question detailed in section 2.Theoretical framework figure 8.

4.3 Idea Co-creation (Workshop 3)

At this point we had reached the ideate stage of design thinking and in workshop 3 we co-created a list of potential courses using the techniques ‘solution storyboarding’ (a picture storyboard that illustrate a brief story of a person using a product or solution to complete a task in a real context) . A solution storyboard is helpful for showing the future user experience of a proposed solution; We used ‘I like, I wish, what if’ which is a technique to gather feedback during the prototype phase. We did this to ensure that course proposals met these forthcoming industry work requirements and collated them by subject area e.g., communication, strategy, storytelling, design thinking, collaboration, managing change, organisational behaviour, leadership, strategy, and policy. We then clustered them into collections of courses that responded to macro environmental drivers that were in part responsible for the range of problems potential users were experiencing. These categories were the skills required for the future of work and the impact of the digital era.

4.4 Developing a systems model (Workshop 4)

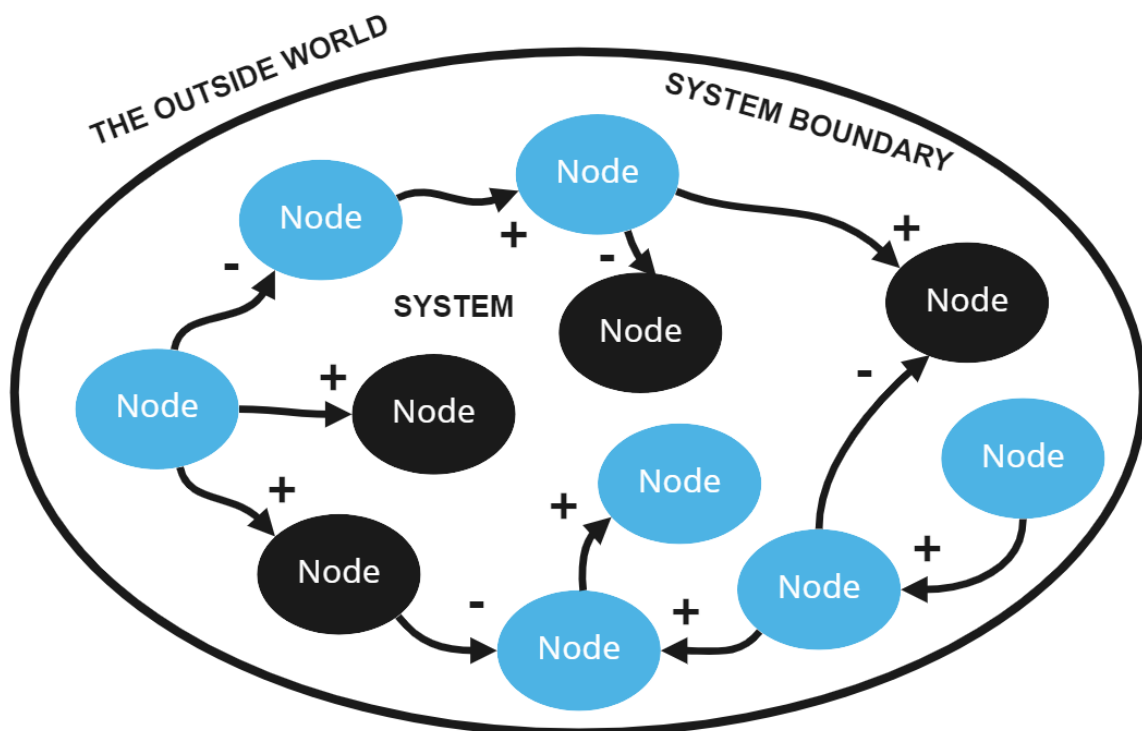


Figure 4: Illustration of a generic systems map

In this workshop we defined variables which were the needs of the three to four most important stakeholders as defined in the problem statement. The stakeholders were aspiring

employees, employees, entrepreneurs, employers, and university academics. With additional variables of, A.I, COVID -19, digital development, time, work pressures, skills deficits, these all influenced the insight of the stakeholders and were needed to capture the overall picture. We examined the system model to locate leverage points, that is, where measures would impact the system.

Our systems map demonstrated specific points at which you can intervene through learning design opportunities to drive positive change across the system. A generic systems map is included as Figure 4 for illustrative purposes. These leverage points enabled us to pinpoint the locations of potential interventions. For example: the speed of course development, anywhere digital connectivity, widening participation and access, future relevant content, ability to apply learning to practice that, if changed in some way, would have a positive impact across our system or amongst key stakeholders.

Key questions we asked here were:

- Where on our systems map would changing the value of a node, create the most positive impact possible across the system? (response- flexibility of learning opportunities)
- Which cluster or collection of nodes need to change in order to bring about systemic change? (response-widening participation, course content relevant to future of work requirements)
- Which causal feedback loops need to be changed or modified to bring about positive systemic change? (response- remove prior learning requirements, increase speed of development, provide financial support for learners)
- Do you need to address multiple points across your systems map to influence systemic change? (response-Yes)

4.5 Reviewing concepts (Workshop 5)

In workshop 5 we reviewed and agreed the concepts for the learning design using the ‘drivers and hurdles’ tool which encompassed checking the course development solutions against the original systems map and to pinpoint areas which could be motivators or barriers to the success of the proposed ideas and then we went on to develop solutions.

4.6 Prototyping curricula solutions (Workshop 6)

We then created a brief for each course and discussed this with a range of academics who were charged with co-creating the clusters, titles, and course content. A workshop was held with several university academics and the content of these courses were discussed and validated. We also went out to both internal assessors and external assessors for their expert opinion, and this was then incorporated into the overall strategy and the course content. In addition to evaluating academic content, we also created a customer journey map for learners to highlight any potential pain points and then went on to develop market opportunity sizing (the total number of potential buyers for a product or service and the potential revenue reach based on that population size) and business model creation.

4.7 Test

We went back out to potential learners and stakeholders with a minimum viable product (MVP) to get feedback. MVP or minimum viable product is a concept detailed in Ries (2012)

that emphasises the need for learning in new product development. It can be defined as a version of a new product that carries the minimum features to engage and satisfy early adopters, from which feedback can be gathered and learned from for future development.

Testing was also an opportunity to take the courses out to a real market. We tested the concepts behind the courses on various social media platforms to gauge if there was a demand for the subject matter in the courses and consider what needed to be adjusted following feedback. We evaluated this using feedback loops and a feedback capture grid. Although academics occasionally test their proposed ideas and concepts for course with students and universities curricula development teams and write up a business case, they rarely test their business models. We knew that a viable business model is important to the success of a curricula development project because it positions the project within a value network and explains how we can transact with learners and academics as well as stakeholders. It also makes it clear why the project will create value. We used a simple business model concept which was focused on solving a learner's pain point uncovered by the customer journey map which was (lack of access to quality accredited practice-based learning with 10 or 20 learning hours which the learner can purchase when and where they want). This concept works by designing and supplying the suite of courses that meets learner demand with an added constraint that we can also sell them for more than it costs us to make. To ensure that a business is viable, feasible and desirable (see figure 2), we designed a business model prototype. We did this so we could use it to reduce costs at various points and develop our value proposition. It was also used to present to the university to gain future funding for the project. To do this we listed all our stakeholders. We then added our value exchanges according to what each stakeholder gives and receives. We ensured that each stakeholder always gives and receives value, even if it comes back to them through another stakeholder. This ensured that the business model prototype is sustainable because each stakeholder is giving and receiving something in return.

It is also important to note that value can be measured in many ways e.g., money; knowledge; reputation; partnerships; etc. we also needed to consider that values flow in different directions e.g., a stakeholder might provide funds/sponsorship to the university whilst receiving recognition and reputation.

A strong value proposition was the key to the project. We created this together so that it deepened empathy for the diverse needs of different stakeholders and so we understood what we needed to offer and what we might receive in exchange from different stakeholders. The value proposition demonstrated what we do, whom we do it for, and how we do it differently.

Value proposition

We create continuing professional development courses for people in or aspiring to be in, the workplace and on course completion will be enabled with the relevant skills to succeed in a changing working environment which has been impacted by A.I, digital developments and rapid change. We do this by creating courses that are accessible, affordable, applicable to practice and are academically robust while meeting the needs for the future of work.

5 Findings

We structured this project by using both systems thinking and design thinking techniques to establish whether this process was beneficial to the stakeholder involved.

We used a systems framework as a socio-cognitive framework to integrate knowledge about the curricula development project. We built and used systems models putting the stakeholders in the centre, and started by starting modelling with three or four variables that represent the most important stakeholders' needs.

The courses were tested using social media by posting up details of proposed courses and assessing the interest and feedback given. We were then able to adjust course proposal in line with the market demand. We were able to react quickly to potential changes because the course development had not been fully completed. This is in contrast to the university's usual development model where courses nearing completion would then be passed to marketing who devised a marketing launch. The result was that the courses were more tailored to industry demand and took less time to get to market which in consequence meant the course material was relevant and up to date.

6 Discussion

6.1 How can the digital transformation of professional development courses be used to develop courses that address the future of work skills deficit?

The project was also innovative in that it was delivered entirely digitally, and materials had to be developed for that purpose. As a result, we now have a robust model to develop and deliver this kind of experience online. Using digital tools we were able to develop online workshop to gain a deep understanding of the needs of industry stakeholders and learners and also able to develop these courses more quickly than the standard development model because we went out to social media with an MVP to test interest and reactions.

6.2 How can Design Thinking and Systems thinking be integrated into digital online learning course design?

Systems thinking enabled us to provide a more three-dimensional view of the problems and issues for short course development. The debates we had with stakeholders in the workshops about what causes these issues and what nodes are relevant drew out differences in the group and after this we were able to come to a consensus. We also realised that we needed to try and understand the entire education system with industry requirements thrown in and that using systems mapping allowed us to highlight the gaps in our knowledge and which areas we need to start observing. By denoting the highly connected nodes we honed in on the levers for change in the system which was a good starting point for generating ideas for further research and ideas for course development.

Design thinking is an innovative approach, and our approach to delivering our design thinking workshops online (due to COVID-19) required even further innovation. Design thinking balances problems with creative techniques. It applies and embraces both structure and chaos and utilises intuition and logic. The adoption of design thinking in organisations

recognises the value of design's capability to enhance innovation and is helping to improve collaboration.

6.3 How is the process of online learning course design enhanced by incorporating design and systems thinking?

People from different disciplines, including stakeholders, learners and academics find they can collaborate online to solve 'wicked problems' and undertake complex projects by working through an iterative process that is abductive, meaning that you can make a probable conclusion from what you know, that is both inquiring and value driven. This is an innovative process which has a focus: the way people create ideas and solve problems.

6.4 Feedback from participants

This was evaluated on both what it gave to participants who were involved in the workshops and on how relevant and current the resulting curricula development was when it launched.

We collected feedback via an audio survey tool from the stakeholder participants. We asked workshop participants; Did the workshop meet expectations?

'It was the first time our team had got together to share ideas and to focus our minds on the end users and their needs and perceptions of skills needs by encouraging everyone to come together really. Um and to contribute to the shared ownership and understanding of the challenges and the solutions of curricula can only be a good thing. I found that all the team to be high, very friendly, helpful, supportive, encouraging, professional, inclusive and organized and they worked really well as a team together to both facilitate and deliver the sessions. and given the fact that they needed to adapt to the challenges of online delivery for the first time at short notice due to Covid-19 was particularly impressive'.

Were there any lightbulb moments?

..the way we used design thinking to put ourselves in the shoes of the learner, and working in teams to create personas and work through those personas....We came across problems that we perhaps wouldn't have anticipated without doing that. And I thought that was really, really interesting.

How can you apply the learning?

'It's really important that I'm able to understand where peoples thinking is coming from and this demonstrated the power of collaboration and bringing different perceptions together to towards a common goal'

These are a selection of findings from the process of collecting understandings form the participants. These and the findings and conclusions from the workshops have been translated into the development of twenty-five short courses which are gradually being launched on the professional development market.

7 Conclusion

Leadership and Management is a key area where skills gaps have been identified and COVID-19 has exacerbated this issue Our course development project aimed to support this need by creating courses that responded to the demands of industry and leaners but was also benchmarked against the predication of future skills shortages. The course, in response to these factors, are completely online with a pedagogy designed for this platform, have no prior learning requirement, are available to learners when they want to enrol (a roll on roll off system) have practice based and industry relevant content that learners can apply immediately to their own practice and are up to date and proactive to the future work skills debate.

This paper has detailed the process for researching the needs and wants of potential learners and stakeholders through a series of workshops designed to discover, problem fit, solution fit , market fit and scaling to develop a learning design process that uses both design and systems thinking .

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Figures

Figure 1 Front cover image: Collins, H. (2021) Design Thinking Toolkit, Open University

Figure 2 Process of course development research and development (2023) Open University course material

Figure 3: Inspire implement ideate (adapted from Brown (2009) in (2023) Open University course material

Figure 4: Illustration of a generic systems map (2023) Open University Course material