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# BEYOND DISCIPLINES: CAN DESIGN APPROACHES BE USED TO DEVELOP EDUCATION FOR JOBS THAT DON'T YET EXIST?

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## ABSTRACT

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## 1 INTRODUCTION

At a time when the role and purpose of universities is increasingly being questioned; when modes of study are increasingly varied; when higher education has become increasingly marketised; when large employers are declaring that a degree will no longer be a pre-requisite for hiring and when the disciplines are changing rapidly, disappearing altogether, or new ones emerging, how can we determine what we should teach in the future and how it should be taught? In such a climate, can universities continue to conform to old constructs of discipline, or are we entering a new era where skill, competency and attitude play a more significant role when employability is the goal? If this is the case, what can we learn from the pedagogies of art and design education that might be of value more broadly?

In this paper the authors reveal the design, development and delivery of a pilot study exploring the potential of adopting a co-creative design-led approach to designing education beyond disciplines. The key protagonists were a cohort of post-graduate students from diverse disciplinary backgrounds studying innovation working with a number of multidiscipline academics and researchers. The paper describes how the academics and researchers drew together relevant literature and adopted a design-led approach to design the pilot project. It then goes on to detail how the pilot project ran and what the cohort created. Further it evaluates the effectiveness of the pilot in revealing useful knowledge for the development of new higher education programmes. Finally, it concludes by identifying how the pilot will inform a subsequent suite of follow-up projects to be repeated at a number of different universities in mainland Europe and South Korea.

The research has been conducted as part of an EU Horizon 2020 Framework, Marie-Sklodowska-Curie Actions, RISE grant project. The project is entitled Global Entrepreneurial Talent Management 3, GETM3. This international project, involving 8 partner universities and multiple employer partners in 5 countries 'in transition' in Western and Eastern Europe, and South Korea, is working with three stakeholder groups: Students and Graduates (future employees); Employers (future wealth creators) and Higher Education Institutions (educators of the future) to explore the role of higher education in narrowing the gap between the expectations of employers and those of entrepreneurial recent-graduate employees. In the case of the pilot study described in this paper, this question is being addressed through generative research around the question "how should universities prepare graduates for jobs that don't even exist yet?" The outcomes of this work and the subsequent follow-on projects will inform the overall findings of the GETM3 programme.

Table 1. Top 10 skills employers seek

	Parade	Climb Professional Development	National Association of Colleges & Employers	Live Career	Target Jobs	Skill by Rank Aggregation
1	Ability to Prioritize	Strong Communication Skills	Ability to work in a team	Communication	Commercial awareness	Communication
2	Works well in team	Analytical & Research Skills	Problem Solving	Organization	Communication	Teamwork
3	Organizational awareness	Computer Skills	Communication (written)	Teamwork skills	Teamwork	Organization
4	Effective problem-solving	Adaptability & Flexibility	Strong work ethic	Punctuality	Negotiation & Persuasion	Problem Solving/creativity
5	Self-aware	Problem Solving & Creativity	Communication Skills (verbal)	Critical Thinking	Problem Solving	Analytical
6	Proactivity	Teamwork	Leadership	Social Skills	Leadership	Flexibility
7	Ability to influence	Planning	Initiative	Creativity	Organisation	Negotiation
8	Effective Decision Making	Decision Making	Analytical/quantitative skills	Interpersonal Communication	Perseverance & Motivation	Leadership
9	Learning Agility	Organization	Flexibility/adaptability	Adaptability	Ability to work under pressure	Technical
10	Technical savvy	Leadership	Detail-oriented	Friendly Personality	Confidence	Proactive

Table 2. Top 10 skills delivered by art and design education

	Ball et al 2010	Bridgstock & Cunningham 2016	Skill by Rank Aggregation
1	Creativity & Innovation	Creative discipline specific skills	Communication
2	Visual Skills	Communication /Teamwork	Teamwork
3	Presenting ideas (communication)	Communication /Teamwork	Problem solving Creativity
4	Research Skills	Generic creativity	Organization
5	Collaborating with others	Critical thinking	Flexibility
6	Making/Technical/Design skills	Self, time & project management	
7	Flexibility/adaptability	Discipline specific knowledge (technical)	
8	Self Management (Organisation)	Digital skills	
9	Problem Solving	Problem Solving	
10	Self Confidence	Entrepreneurship, business management	

Shreeve et al in their 2010 article, ‘A kind of exchange’: learning from art and design teaching,’ [5] identified that education in this domain, which results in ‘independently creative’ graduates, is typified by student-centred, experiential, experimental, ontological and dialogic pedagogies supporting a ‘fluid curriculum’. Wastell, 2014, [6] highlights how adopting a ‘design attitude’ in business studies achieves ‘relevance’ and Glen et al, 2014, [7] highlight the value of design thinking pedagogies to promote adaptive reasoning, essential for addressing ill-structured situations. The implication for HE more broadly, in responding to the employability agenda, is that the approaches adopted in Art and Design education may have a more diverse role to play in delivering the key skills sought by employers, irrespective of disciplinary field.

In order to understand more about what graduates see as important in the workplace, the authors have used a Design Thinking [8] workshop to elicit from students their ideas about the role universities might play in narrowing the gap between employer and employee expectations of the workplace (i.e. psychological contracts). By comparing their work with the skills and educational approaches identified above, we may infer a future role for design education beyond the design disciplines.

## 2 METHODOLOGY

This research has been conducted through a multi-method approach involving reflection in, and on practice, observation, semi-structured interview and ‘dynamic prototyping’ to collect the perspectives of students as future employees. The paper is a reflection on the preparation, delivery and evaluation of a workshop pilot, in other words, a prototype. During delivery of the pilot, the authors facilitating the workshop, reflecting in action, found it necessary to modify their plans in real-time, hence the term ‘dynamic prototyping’. The cohort who participated comprised 17 students representing 8 different nationalities who between them have experience of studying in 6 different countries, 12 different subjects including mathematics, fine art, journalism, software engineering, sociology and design. They have between 0 and 10 years of professional employment experience.

### 3 WORKSHOP DESIGN

As its context, the workshop was designed to respond to Prof Martin Boehm's, 2017 question [9]:

*"We see significant changes in labour markets of the future. [...] Eighty percent of jobs that will exist in 2025 don't exist today; we have to prepare our students and graduates for a world that's essentially not possible to prepare them for. That's clearly going to be a challenge, and it has implications for the pedagogical approach: what are we actually going to teach in our programmes?"*

Partners from across the GETM3 network contributed resources that captured stakeholder contexts. They also invited colleagues to participate in the planning, delivery, execution, evaluation and evolution of the initiative. The authors are experienced in running co-creative rapid design exercises using adaptations of the Google Ventures Design Sprint approach which follows five stages of activity over a five day period: Unpack; Sketch; Decide; Prototype; Test, all preceded by a 'Set the Stage' period of preparatory work. In this case, time was limited to two days for the workshop, and, therefore an accelerated approach was called for which was delivered over 4 sessions: Unpack (problem-framing); Sketch (ideation); Decision & Revision; Communication.

The design-led innovation academics at Northumbria University leading this pilot have devised a tool known as 'Creative Tensions' [10] that allow workshop participants to rapidly assimilate stakeholder concerns in a given situation. They offer a way of representing a Problem Space as a set of exaggerated statements positioning perspectives relating to a situation or circumstance to bring the problem to life. Typically, the workshop facilitators prepare these template-based statements in advance. However, in this case, in order to truly represent the voice of graduates, the team chose to work with the participants in the days prior to the workshop to develop these tensions themselves.

The themes that the group developed were: Communication; Time Management (organisation); Flexibility; Organisational Culture (team working)

#### 3.1 Workshop plan

The workshop was planned thus:

A multidisciplinary group of postgraduate students studying for a degree in innovation would be the participants facilitated by the staff that regularly teach them. They would work as a large group for the first and final activities and in smaller sub-teams for the intervening activities.

- **Set-up** – participants were to be provided with links to the various resources that the collaborating partners had provided two days before the event. These comprised predominantly articles from popular press, specialist media and TED talks.
- **Session 1 - Problem-framing**
  - Briefing – context setting, share Creative Tensions and establish six sub-teams
  - Activity 1: Learning Journeys – work in small groups to map learning journeys relative to each theme: what was learned, how and where; how it was assessed and recognised
  - Activity 2: Adapted World Cafe approach. Rotate from theme to theme using the Creative Tension as a prompt to ask 'what if universities did...' questions building upon the ideas of participants who have already contributed to this theme
  - Activity 3: Sum-up – what were the really interesting, novel or fragile ideas upon which we can build? What have we missed?
- **Session 2 - Solution development... Shhh it's a secret!**
  - Advise teams that for the forthcoming activities they will work 'in secret', hiding their ideas from the other teams
  - Activity 1: Synthesis - for each tension, translate the most compelling combination of 'what-ifs' into propositions
  - Activity 2: Wildcard – two unexpected contextual changes presented at random to each team with the purpose of provoking broader consideration of the emerging intervention and to aid decision making
- **Session 3 - Solution development 2... Shhh, it's still a secret!**
  - Activity 1: Create, test (through devil's advocacy questioning) and re-create refined learning journey for new proposition using the same format adopted in problem-framing. Consider this from each stakeholder perspective
- **Session 4 - Reveal, combine and communicate**
  - Activity 1: Reveal - pitch the six interventions to each other, elicit questions and feedback
  - Activity 2: Combine and refine the six interventions into a proposition

- Activity 3: Create a single proposition pitch
- Activity 4: Deliver the pitch
- **Session 5 - Reflection**
  - What did we learn about the topic?
  - What did we learn from the approach?
  - What can be done differently in the future?

## 4 WORKSHOP EXECUTION

### 4.1 Problem-framing

The Problem-framing sessions ran broadly as planned with two significant differences. Firstly the facilitators recognized that, having been involved in the creation of the themes and corresponding Creative Tensions, the participants were immersed in the problem-space before starting the workshop. In order to energise the group and freshen-up their thinking, a list of '10 skills employers say they seek' and a separate list of 'soft-skills' were given to the participants to consider in combination with the Creative Tensions. Secondly, after two rounds of the World Café activity, the facilitators saw that the participants were stagnating and repeating ideas they had used in the previous round. Consequently for each subsequent round a slightly revised challenge was put to them: 'What is the best idea on the table? Build on this'; 'What would make a reluctant student say 'yes'?' etc.

### 4.2 Solution Development

The Solution Development sessions followed the planned structure. Working 'in secret' added a focus to the participating groups' activities. However it was necessary for the facilitators to adapt to the ideas and activities that were being developed. Whilst the groups were all eventually able to synthesise the most promising ideas into preferred propositions, they had to be prompted to remember the key skills list to aid them in decision-making. The main adaptation required at this stage was relaxing the requirement to use the Learning Journey model viewed from different stakeholder perspectives. This was necessary for two reasons. Firstly, some of the interventions being proposed were higher-level thinking than could be reasonably expressed through a learning journey. To impose this restriction would have closed-down the expansive thinking of the teams involved. Secondly, throughout the exercise the majority of participants found it difficult to adopt the employers' perspective. For these reasons, the teams were allowed to deploy different means of envisioning their intervention.

### 4.3 Reveal, Refine and Communicate

For the final Reveal, Refine and Communicate session the facilitators decided that it was necessary to change direction more radically. In the planning they had envisaged that a single, coordinated and integrated proposition could be drawn together from the separate teams' propositions. It was anticipated that, by keeping their ideas secret from each other, the Reveal activity would elicit incisive questions and constructive feedback based upon what was presented rather than what was assumed or had been assimilated had the activity been open. This was indeed the case. However, what became very clear to the facilitators was that, having been afforded such an open brief and open approach to envisioning, it would have been too difficult and contrived to force-fit the six interventions into one solution within the available time without losing some of the more challenging and fragile (but inspirational) ideas. For this reason the teams were given an hour to sharpen their individual propositions based upon the critical feedback and questions shared during the Reveal.

### 4.4 The resulting interventions

Six interventions, derived from the original themes were proposed as follows:

- Initiative: a web-based platform that capitalises on millennials' entrepreneurial mindset by providing a safe-space for student/industry project-based collaboration
- Work Ready Me: a university/industry collaboration through which gap-years that promote and recognise competency development are delivered.
- Co-versities: a university/industry team-based collaboration that delivers learning about culture within organisations - they exist for the benefit of both students and the businesses and have multiple global sites providing innovation-hubs and peer-to-peer learning.

- Personal Development: delivered through a life-long learning fund and academics who no longer work in universities but sell their teaching through a web-based platform.
- Learn Communication, Achieve Impact: delivered through community impact via ‘Communi-care’, a system by which students learn all about communication whilst developing and delivering social benefit through working with local charities.
- Uncertain Spaces: (developing flexibility) the university as a bridge between employer, student and the old job roles that will be taken by robots (medicine, law, management) and the new (creativity, innovation, design, engineering...) achieved by establishing ambiguous physical environments without rules and conventions in which students collaborate with employers.

These were presented to senior academics from Slovenian and South Korean partner institutions and their observations form part of our discussion.

#### 4.5 Reflection

As a means of ensuring that both students and academics benefit from maximum learning from each project, it is customary for the academics who led this activity, to hold a reflection session immediately on its conclusion. In this case, whilst the reflection session did address what they had learned about the topic we will concentrate here on what was learned from the approach (the workshop design) and what, from their perspective, might be done differently. There were four main reflections:

1. Resources: the participants didn’t engage fully with supplied material prior to the event and would have preferred this summarised within the brief at the start of the event.
2. Creative Tensions: for these to be truly effective, they need to represent multiple different perspectives for each theme.
3. Employers: the graduate talent voice was well represented within the event, as was the university perspective (through the facilitators) but more authoritative employer perspectives were missing.
4. The introduction of Wildcards was seen as positive, but they weren’t universally helpful: in many cases they aligned too easily with emerging propositions so it was easy to incorporate them.

Furthermore the participants highlighted a number of aspects that they found particularly helpful: structure and facilitation; the use of templates; the use of learning journeys (although they commented that these need to form a strong theme throughout the whole workshop); maintaining secrecy which encouraged productivity and trust.

## 5 DISCUSSION

Through the Reflection session and discussion with our overseas partner academics we have arrived at a number of discussion points that need to be considered when refining the workshop design for future use in other locations if it is to make a useful contribution to the overall GETM3 research. Firstly, we must consider the points raised by the students during the Reflection session each of which is relatively straightforward to remedy through refining the pre-prepared resources and templates involved in facilitating the workshop.

Predominant amongst further considerations is the fact that these participants were all of a creative mind-set, they were familiar with working in teams, engaged in enquiry-led cooperative learning using Design Thinking to address challenges posed to them by potential employers, albeit they had only been experiencing this for one semester. Coupled with the fact that they were involved in determining the Creative Tensions and themes, this makes their suitability for a pilot study somewhat questionable. Indeed, in a number of cases, the teams arrived at proposed interventions that mimic the Masters degree they are currently studying for. A typical cohort when the finalised workshop is deployed is more likely to comprise students with backgrounds in business studies, the humanities and social sciences and the authors need to be mindful that greater encouragement and facilitation will be required. However, there is potential that these participants will present a more diverse range of interventions due to their different experiences and their unfamiliarity with Design Thinking.

Whilst the participants represented very diverse cultural background and prior HE learning experiences, our overseas colleagues suggested that we may need to tune the workshop to satisfy local cultural differences. For example, it was suggested that in one of the partnering countries, for example, an instruction to work in secret would in fact encourage students to do the opposite! Implicit in this is a need to engage with local academics in refining the workshop design for use in each setting.

The themes, Communication; Time Management (organisation); Flexibility; Organisational Culture (team working); Personal Development and Work Experience, and the interventions that the students produced reinforce the inference drawn in the introduction to this study because the themes correspond broadly with the top skills required/delivered through design education and the interventions tend to be dependent on the sort of pedagogies highlighted by Shreeve et al [ibid]. However, the participating cohort were desensitised to the novelty of the design education approach and it will only be through running subsequent workshops with cohorts without such experience that the authors can start to evaluate a, whether they learn anything relevant to the employability skills from being exposed to design education approaches adopted in the workshop and b, whether the themes and interventions they create reinforce or contradict what the study infers.

## 6 CONCLUSION

The pilot study provided valuable insights that will inform future iterations of the workshop. The format was enabled students to work together employing Design Thinking approaches to explore the wicked problem of what and how universities should teach in order to equip graduates with the skills that employers are likely to seek even when the job role is yet to be defined. The pilot was useful in helping the authors refine the workshop design for subsequent use with more diverse cohorts. The pilot participants came up with themes and interventions that support the idea that a design education approach could be effective in delivering these skills. However, the creative disposition of the pilot cohort and lack of a more authoritative employers' voice highlights the need to deploy the refined workshop with multiple 'non-design' cohorts and employers in order to start to draw firm conclusions.

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