

The design educator's dilemma

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"...the logical, competent decisions of management that are critical to the success of their companies are also the reasons they lose their positions of leadership" (Christensen, 2013)"

The fact that the average lifespan of an S&P500 company has reduced by a quarter in the last 100 years is well – witness Polaroid and Kodak in the photographic industry or the more recent descents of Nokia or Motorola in the mobile industry – to give but a few often cited examples. Against this backdrop, the higher education 'market' currently finds itself at the nexus of several fundamental shifts of its: from the globalisation of educational provision and near universal access to information; to rising income inequality and a growing political polarisation (in Europe at least) between the provision of 'free' and 'for a fee' higher education.

While corporations are haunted by the spectre of their own potential downfall and have as a result developed a recognised suite of approaches – from the 'skunk works', joint venture, acquisition or organisational change programme – to try to ensure their future relevance; the 'industry' of education; those universities with real estate, departmental structures, existing offerings and engrained cultures of their own, struggle with the uncertainty of change and a lack of recognised approaches to curriculum design.

When considering design education in particular, this situation is especially acute. In the sphere of design practice, the language of innovation – and the distinction between incremental and radical innovation – has been adopted to frame and describe the nature of

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change required by creative efforts. However, from a review of design education literature and interviews with design educators conducted by the researcher, it appears that the very process of design and language of innovation often introduced in educational work with students, is not consciously adopted by institutions when considering the future development of their own programmes). Moreover, there is very little existing research into this topic.

Keywords: *Design education; curriculum design; innovation strategy; organisational change*

Introduction

In business and management literature, there has been – since the 1970s – a focus on understanding the variables that affect a company's ability to innovate in order to maintain its position of success (Norman and Verganti, 2012). An important dimension that arises repeatedly is the distinction between incremental and radical innovation. The former, referring to small changes that improve a product's desirability, costs or performance; the latter, involving the transformation of a company's view of the marketplace, its customers and product offerings (Leifer et al., 2000). The concept of incremental and radical innovation was first illustrated by Utterback and Abernathy (1975) and has been returned to under various guises by a variety of scholars; from Porter's discussion of continuous versus discontinuous change (Porter, 1986), to Christensen's explication of incremental versus disruptive innovation (Christensen, 1997). More recently Norman and Verganti simplified the distinction as between "doing better what we already do" and "doing what we did not do before" (Norman and Verganti, 2012). For organisations, the implications of considering radical innovations can be profound, as summarised by Davila, Epstein and Shelton (2012):

Table 1 Summary of characteristics of incremental and radical innovation

Incremental	Radical
Builds upon existing knowledge and resources	Requires new knowledge and resources
Competence enhancing	Existing competence loses value
Relatively small changes in performance/utility	Step changes in performance

Owing to the efforts of prominent design academics such as Verganti and Norman, in the spheres of design education and professional practice, the language of innovation – and the distinction between an incremental and radical focus – has been widely adopted

to frame and describe the nature of change required by creative efforts (Christensen, 2013; von Hippel, 1995; Verganti, 2009).

Turning to design education, this paper seeks to address the questions of how much innovation is there in design education today and of what type, and to what extent is curriculum design considered as a recognised practice by designer educators today?

After establishing a framework for analysing the types of innovation in design programmes, and summarising the scope of curricular by leading institutions across the world, an examination of literature on curriculum design in design education, and the results of preliminary research with a sample of educators across Europe will be presented, and areas for further study highlighted.

Innovation in design education today

To situate any discussion of future innovation in design education, it is worth first surveying the current array of design degree programmes at undergraduate and graduate level and the extent to which incremental or radical innovation can be observed as being present.

However, determining which programmes should be considered innovative, and to what extent (incremental or radical) is not without its problems; as design education is a broad field of study, with many subjects to choose from (with inconsistent nomenclature) and a variety of curricular models. To simplify matters for the purposes of this review, we will focus on the disciplinary or subject focus of degrees as a proxy to assess the level of innovation present in the current education 'marketplace'.

In the UK, the Universities and Colleges Admissions Service (UCAS) collate information and provides statistics on the nature of programmes across the higher education sector. The 'Design Studies' category, at the last count (UCAS, 2012) included 229 degree programmes in design across the UK. However, the majority of these originate in four design 'subjects'; graphic design, product/industrial design, interior design and fashion design (UCAS, 2012). For the purposes of this review, these four subjects will provide a baseline from which innovation by design schools into new subject areas or disciplines can be gauged.

Beyond the UK, taking a comprehensive broader international perspective of the level of innovation in design curricula would be an extensive undertaking, and is one for which no comprehensive data set exists. However, for the purposes of this review a proxy is

available to provide an indicative view. The QS World University Rankings provide an annual comparison of universities based on academic reputation, employer reputation and research impact (QS, 2016) Their 2016 rankings for Art and Design, highlight the following institutions as the top 20:

Table 2 QS World University Rankings Art and Design, Top 20 (2016)

Ranking	Institution	Ranking	Institution
1	Royal College of Art, UK	11	Goldsmiths, UK
2	Massachusetts Institute of Technology, USA	12	California Institute of Arts, USA
3	Rhode Island School of Art and Design, USA	13	Carnegie Mellon, USA
4	Parsons The New School, USA	14	University of California, USA
5	University of the Arts, UK	15	University of Oxford, UK
6	Pratt Institute, USA	16	RMIT University, Australia
7	School of the Art Institute of Chicago, USA	17	Aalto University, Finland
8	Stanford University, USA	18	Design Academy Eindhoven, Netherlands
9	Yale University, USA	19	Art Center College, USA
10	Politecnico di Milano, Italy	20	Glasgow School of Art, UK

Taking this range of institutions as a qualitative sample, by reviewing programme prospectus on faculty websites, it has been possible to gain an understanding of the range of undergraduate and graduate programmes on offer by each institution. Taking the four design subjects framed above (graphic, product/industrial, interior and fashion design) as a baseline, an attempt has been made to classify the level of innovation in subject focus of both undergraduate and graduate degrees as follows:

Table 3 Definition of types of innovation in programme subject

No innovation	Incremental innovation	Radical innovation
Only degrees standard design subjects offered	New design subjects that build upon existing knowledge and resources and continue exist alongside standard subject offerings	Step changes to the framing of subjects that reconceptualise the curriculum on offer along new lines

Examples - BA/MA Product/industrial design - BA/MA Graphic design - BA/MA Interior design - BA/MA Fashion design	Examples - MDES Service design - MA Information design	Examples - MFA Transdisciplinary Design - MA Art and Science - MA International Design and Business Management
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Using these categories, an analysis of the range of degree programmes (at both undergraduate and post-graduate level) offered by each institution has been performed and a summary produced of the extent to which this sample of twenty design schools have innovated their curriculum:

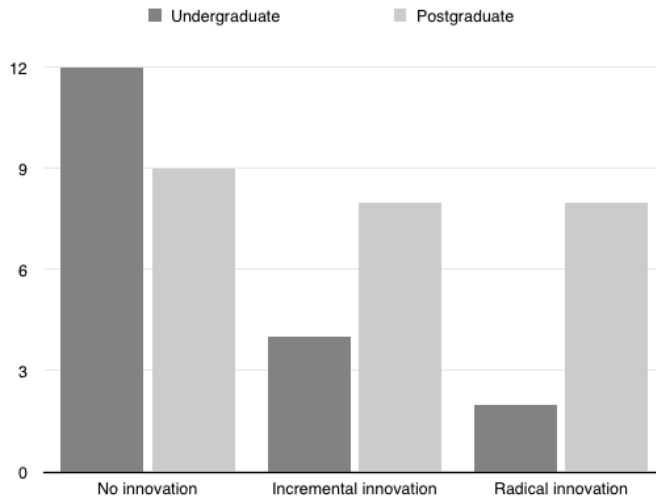


Figure 1 The extent to which top twenty design schools have innovated their curriculum and in what way: number of schools adopting each innovation type, split by undergraduate and post-graduate programme). (QS World University Rankings, 2016 and researcher web search)

From this overview a number of observations can be made. Firstly, that the majority of universities surveyed offer little innovation in the framing of their undergraduate design degree subjects; sticking to the four standard design subjects. In contrast, almost half of institutions

have incrementally or radically innovated the range of postgraduate degrees they offer. In addition, by further investigating the institutional and faculty heritage of innovative programmes (as much as can be deduced from available online material), it becomes apparent that much incremental and radical innovation has its genesis in product/industrial design. For example, Parson's MFAs in Strategic Design and Management or Transformation Design programmes, Politecnico di Milano's Masters in Product Service Systems Design, or Glasgow School of Art's Masters in Design Innovation have all emerged from product/industrial design programmes and their associated faculty.

This last observation is supported more widely in literature. A variety of scholars (Broadbent and Cross, 2003; Buchanan, 1992, 2001) argue that the product/industrial design area of both practice and education has been placed under particular pressure in recent years due to external dynamics such as the shifts from: a manufacturing to service economy; a focus on physical to digital products; and a focus on designing to 'design thinking'. According to Buchanan, these factors have forced a consideration of change within education not seen in other subjects such as interior or fashion design.

Designing design curricula

Having provided an indicative overview of the nature and extent of innovations in design curricula, and established postgraduate study as an area of particular activity, it is worth now turning to the practice of curriculum design to understand the extent to which it is considered a recognized field of study within design education today. Firstly, in order to situate curriculum design within design education, we must look beyond design education literature to the wider field of curriculum design within educational research.

Curriculum design beyond design

Surveying literature on curriculum design, it is surprising to learn that curriculum studies as a field of study is in its relative infancy and has generally not been focused on in higher education. Taking a long view, for Young (2013), the functions of the curriculum can be seen from two different epistemological perspectives. Since the 19th century the curriculum has been viewed simultaneously as a positivist source of secularized 'sacred' knowledge to be passed on, or in an anti-positivist sense as a frame through which the latent abilities of

learners can be released for their creative capacities to flourish. These slants in emphasis see either a curriculum focused on content or pedagogy (“the knowledge that pupils are entitled to know” versus “what teachers do, and get pupils to do”, Young 2013, p111). To Young though, curriculum studies discourse has shifted away from focusing on the what needs to be learned, when and how, to establishing a critique of the power relations at play in the curriculum along common lines of class, gender and race.

This suggests that regardless of discipline or educational level, a greater investigation of curriculum design is needed. Surveying a range of literature from education, curriculum and pedagogy journals, it is apparent that much curriculum studies research on the *process* of curriculum design is centred on primary and secondary education and the ‘national curriculum’ of many countries, with higher education (and therefore design) relatively under-represented. Nonetheless, several reference points have been identified that focus on the process of curriculum design, its participants, and the types of expertise they require. Although non-exhaustive, it is hoped they will provide a general context in which to situate a literature review of curriculum design within design education itself.

Firstly, Huizinga (2014) presents a comprehensive literature review and study on the role of teachers in the curriculum design process. Drawing on extensive research since the 1940s by various European and US scholars, Huizinga documents the shift to include teachers more actively in the process of large scale national curriculum reforms in various countries, after centralized efforts in the post war decades were seen as unsuccessful. In an attempt to frame the areas of expertise that prospective teacher-designers may need to develop, Huizinga, identified detailed types of knowledge and skills required of teachers involved in the curriculum design process under four categories: from curriculum design expertise and subject matter knowledge, to pedagogical content knowledge to curriculum consistency expertise (see Table 1). Such considered and in-depth discussion of the attributes of the future curriculum designer, has so far been absent from discourse in design education. Although Huizinga establishes a framework for understanding design expertise for curriculum, the study offers little about the nature of the curriculum design process itself, and specific activities teachers undertake.

Table 3 Summary of curriculum design expertise (Huizinga, 2014)

Curriculum design expertise	Subject matter knowledge	Pedagogical content knowledge	Curriculum consistency expertise
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<ul style="list-style-type: none"> • Knowledge and skills to formulate a problem statement • Idea generation skills • Systematic curriculum design skills • Formative and summative evaluation skills • Curricular decisions-making skills • Implementation management skills 	<ul style="list-style-type: none"> • Knowledge and skills to keep subject matter knowledge up-to-date • Knowledge and skills to gain insights into learners' subject matter knowledge difficulties 	<ul style="list-style-type: none"> • Pedagogical repertoire • Material selection skills • ICT selection skills 	<ul style="list-style-type: none"> • Knowledge and skills to create internally consistent curricula • Knowledge and skills to create externally consistent curricula
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Turning to a higher education context, O'Neill (2010), laments the general absence of literature focusing on the curriculum in higher education, and lack of knowledge about the curriculum revision process in particular. In the literature that does exist, O'Neill finds a complex situation. Firstly, there are varying definitions of curriculum in use in higher education: from the content and structure of a study 'unit', to the content and structure of a 'programme', students' learning experience, or the process of teaching and learning. Secondly, there are few overviews of the approaches to curriculum design in use in different contexts. The extent to which factors such as the educational context in which curriculum revision happens, the people involved, and the processes and procedures adopted are all considered appears to vary greatly.

To understand curriculum planning further, O'Neill adopts an education practitioner-focused research approach to understand the approaches taken by academic staff in different contexts at the start of the curriculum revision process in particular, and the factors that influenced their practices. Through this research, O'Neill uncovered both informal 'dialogic' approaches and formalized curriculum design processes.

Within the informal approaches, it was found that there is often a 'trigger' that prompts the need for curriculum change, for example, issues with student performance levels on assessment, a high drop out rate, or administrative pressures. In this context educators advocated the need to investigate and understand the driver of curriculum change, through conversations with colleagues and a conscious period of questioning, listening and discussing the issues to be addressed. Following this 'dialogic' phase, educators were found to enter a more formalized process of curriculum revision. In this formal phase, O'Neill found three main starting points for the revision process:

- The desired learning outcomes of the programme
- The desired attributes of graduates from the programme

- The educational philosophy of the programme

Among these approaches, starting with learning outcomes was most common. To O'Neill one driver for this impulse is the 1999 Bologna Declaration (European Commission, 2009), which was designed to provide European universities with a blueprint for developing transparent learning outcomes and facilitating student mobility.

The second most popular approach, was what educators described as the 'graduateness' approach. By exploring the type of graduates that are needed by the end of a programme, educators can engage in a process of 'backwards design' to identify the curriculum revisions needed. After surveying literature on this approach, O'Neill concludes that this way of revising curricula draws from the fields of architecture and engineering design process and is most commonly found in professional disciplines where certain competencies are required by the end of study.

The third formal approach, was to start the revision process from the educational philosophy of the programme. This model stems more on the beliefs, values and ideologies of the individual educators which together for a shared philosophy of education, and the model of teaching and learning that they advocate. To O'Neill, this approach is representative of a wider 'process model' of curriculum development.

More recently, at UK universities, there has seen a period of significant research into curriculum and learning design. (Cross, Galley, Brasher and Weller; 2012) centered around a large scale project by the Open University's Learning Design Initiative (OULDI) in partnership with JISC (a non governmental body providing leadership in learning, teaching and research).

Like O'Neill, this work draws attention to the fact that in the context of higher education, there is an inherent ambiguity in vocabulary around this field; with terms like curriculum design, learning design, and instructional design all recognized and often used interchangeably. Within the OULDI-JISC work curriculum design is defined as "high level process defining the learning to take place within a specific programme of study" (Cross, Galley, Brasher and Weller; 2012, p5), while learning design is described as the "range of activities associated with better describing, understanding, supporting and guiding pedagogic design practices and processes" (Brasher, Conole, Cross et al; 2008, p179). In this way learning design takes on a broader scope of research activity. Within this context, the OULDI-JISC project focussed on the idea of 'learning design methodology'

from multiple perspectives, for example; researching and supporting designers, understanding the learning design approach of designers, or understanding learning design as an agent of change in institutional design practice.

From this standpoint of learning design methodology, the OULDI-JISC project has sought to:

implement, evaluate and revise a range of learning design tools, approaches and resources that had been developed for the enhancement of formal and informal curriculum design practice(Cross, Galley, Brasher and Weller; 2012, p2)

While the OULDI-JISC project's main strands of work share some common aims with this researcher's enquiry; that is to say in their aims of understanding and developing design processes and ways of representing curriculum designs, the scope of work does highlight a number of interesting areas for further exploration.

Firstly, although there are a variety of terms in use to describe the OULDI-JISC project's field of enquiry (learning design, curriculum design etc), their common denominator is the use of the word 'design'. The prevalence of this terms lead naturally to a comparison of what is meant by design practice in the field of curriculum/learning design as compared to the field of design research described in earlier sections of this review. For Cross and Conole (2009) the use of the word design serves as a device to allow the scholarship of teaching to be reclaimed. For Conole (2010) the use of the word design affords teachers and educators the opportunity to take a more 'principled' approach based on research and knowledge about what works. Such efforts draw reference from design theory as it relates to other disciplines such as music, chemistry or architecture and their idea of a design 'language' as it occurs in the forms of notation that these fields employ. However, discussion of design in and around the OULDI-JISC work does not make reference to the idea of design as a way of knowing and thinking in its own right (as Archer, 1979; Cross, 2001; Schön, 1994 would describe it) and understand how this could relate to learning design research.

Secondly, what the use of the term 'design' in the context of learning design methodology alludes to the difference between the 'formal' institutional learning design processes and the informal practice of educators (Cross, Galley, Brasher and Weller; 2012), as introduced by O'Neill earlier.

While many educators already engage in learning design of some kind, this may be tacit and unrecognized as such (Cross and Conole,

2009). Moreover, even where there is an established formal practice of learning design at an institutional level, informal processes for refining courses often emerge in response to the perceived bureaucracy of formal design processes (Ferrell, 2011). Indeed the OULDI-JISC project was in part motivated by a desire to bring more conscious consideration of method to non-institutional forms of learning design. As the final project report documented:

There is often a great difference between the idealized process (that codified in guidance and formal organization of staff) and the real process interactions that take place; a difference between management sponsored process and what individual staff do. It is in the practices and culture of the latter – the lived enacted process – that this project has particularly sought change. (Cross, Galley, Brasher and Weller; 2012, p17)

This distinction between the formal institutional and informal learning/curriculum design processes is one which could be explored further within the context of design education.

Curriculum design in design education

What then of the curriculum design in design education? An extensive literature review of design literature, and a search for reference to design education in curriculum studies has borne limited fruit. However, there is a recognition for the need for greater understanding of the informal and formal practices and processes of curriculum design at work, and some tentative forays by researchers keen to explore possible approaches.

Surveying references to the design of specific curricula in design education literature, it becomes apparent that discussion often centers around their role as 'texts' in a particular institutional contexts, to be 'read' as objects revealing something about the nature of the situation in which they were created (Grimmet and Halvorson, 2010). For example, in Findeli (1990, 2001) and Buchanan (2001), specific curricular examples (from the Bauhaus and Carnegie Mellon respectively) are introduced and examined in relation to how they relate to the state of design as a discipline and the educational philosophy of the institution (or leading educators) at the time that they were created. To refer to , there is little examination of the process by which these 'texts' are developed in the first place, and how the 'system world' of the curriculum as an object relates to the 'life world'

of learning experienced by the student or educator (Grimmet and Halvorson, 2010).

To Teixeira (2010) the lack of focus or value place on the practicalities of curriculum design and development represents a fundamental misalignment in design education. Teixeira argues that while changes in the state of design as a discipline have prompted educators and academic leaders to proclaim new missions and visions for their design programs and the role of the future designer in society; they have continued to deliver their programmes through curriculum models developed in the early 20th century:

The goals and values of design education have undergone significant transformations since the beginning of the last century, but most design curricula have maintained their original configurations, going back to the Bauhaus, with only minor adjustments in the distribution of specialized and general education courses. In many ways, design curricula have been defined primarily from ideological points of view, in many cases aligning with disciplines based on ideological principles rather than potential synergies for producing knowledge. (Teixeira; 2010, p414)

This view is supported by Reeder (2001) who has found that the formation of industrial design curricula is largely based on the historical practices of teaching design. Ünlü (2004), sampled a wider group of design educators in the 1990s and drew conclusions similar to those uncovered by this researcher in educator interviews. Ünlü found that there was some 'mysteriousness' around the process of curriculum development within design education, to the extent that drawing any conclusions about specific approaches taken is difficult. It was noted that although some institutions do have committees responsible for their design and development it was found that much curriculum development takes place on an informal basis by individual staff members, often in decision making positions. In Ünlü's study, there was also perceived to be a low value attached to the process of curriculum design by staff. Moreover, it was found that the concentration of curriculum design efforts in the hands of the few meant that staff turnover was perceived to be the biggest driver of curricular change.

To others, this 'mysteriousness' surrounding curriculum design within design and the lack of attention it is given can be explained by design's outward orientation. As Borja de Mozota (2011, p18) phrased it "design thinks, but forgets to think about itself; indeed, it should not

forget to think about itself". It would seem that the lack of emphasis or value placed on curriculum design within design education results in a strong reliance on the informal or dialogic approaches to curriculum revision described by O'Neill earlier.

Bailey (2010) describes the informal early stages of the curriculum design process experienced by senior academics from separate schools of the same university during the framing and creation of a new multidisciplinary design masters programme in the UK:

Several meetings were conducted before any clear direction or structure was identified. In hindsight, perhaps what was happening was an orientation and alignment process through which each individual was making sense of the overall programme objectives and once they had contextualised it from the point of view of their own discipline, attempting to find a language of expression which was congruent within the group. (Bailey; 2010, p2)

Aside from the practical implications of the lack of understanding of curriculum design for design educators, for Tovey (2011) and Osmond (2011), this knowledge gap has more serious implications. For without knowledge of the curriculum design process and its effectiveness, design education is more vulnerable to influence from external factors outside of its immediate control. For example, Tovey argues that the growing 'managerialist tendency' driving increased class sizes, the modularization of the curriculum, and standardization of assessment is difficult to counter without design research and pedagogic research that can provide an evidence base for curriculum design and investment.

Moreover, to Shreeve (2001), this lack of research into the efficacy and importance of art and design's 'signature pedagogies' (the crit, the studio et al.) means the increase in class sizes and decline in studio space makes it less likely that students (and therefore institutions measuring their experience) will find these pedagogic approaches to be valuable learning experiences.

Despite the absence of recognized approaches and vocabulary to describe curriculum design in design, a review of the literature has uncovered two collaborative approaches, from different epistemologies of design and philosophies of design education.

From a positivist perspective, Eder and Hubka (2005) explored a theoretical foundation for engineering design education through a review of papers and collaborative discussions at a workshop for

engineering design educators from across Europe. The authors created a curriculum design framework by describing a set of educational variables: 'why' (goals objectives, measurements), 'who' (learners and teachers), 'what' (contents and form of their presentation, 'where' (social structure and learning environment), 'with what' (teaching and learning materials and media) and 'how' (instructional methods).

Drew (2011) on the other hand has adopted a more 'designerly', approach, exploring how co-creation methods and 'reflection in action' could be applied to the design of education by experimenting with participatory design techniques to involve wider institutional stakeholders in the framing, development and planning of a new graduate curriculum at an institutional level. Through a series of collaborative working sessions, Drew first co-ordinated the definition of a new curriculum scope with senior education management before facilitating two collaborative cross-institution workshops; the first to co-create a new vision and purpose for a graduate school; the second to develop a cross-school implementation plan by interest groups.

Drew's approach consciously applies the collaborative methods of design to the design of design education, and represent a rare example of design education 'thinking about itself' (to refer to Borja da Mozota's earlier words). Both examples demonstrate the potential of curriculum design as a collaborative process; Eder and Hubka at in an inter-institutional context, and Drew at an intra-institutional, cross faculty context. These tentative efforts can be seen as the new shoots of a potentially broader field of investigation into curriculum design practices.

Through literature review it has been discovered that the topic of curriculum design in design education is surprisingly under-researched. However, examples such as O'Neill and the OULDI from beyond design, and Ünlü within design, demonstrate that the potential for more understanding of the people, practices and processes of curriculum design exists. Moreover, the notion that curricula can be 'read' as texts opens up possibilities for understanding the 'products' of the curriculum design process. As demonstrated by Drew and Eder and Hubka, this suggests two possibilities: firstly, that curricula can be viewed as a window through which to view a specific institution's framing of design education.

Curriculum design in practice

During March and April 2014, one-hour ‘scoping interviews’ were conducted with 11 design educators across Europe. All were participants – to some extent – in the development and refinement of curricula, at either an undergraduate or post graduate level; either as senior lecturers, programme leaders, or departmental heads (see Table 4 below).

Table 4 Table 4: Summary of educator interview profiles

Educator	Position	Programme name	Country
1	Programme leader	MDes Design Innovation	UK
2	Course Leader	MA Industrial Design	Sweden
3	Subject leader	MDes Design Innovation and Citizenship	UK
4	Programme leader	BA Design for Industry	UK
5	Principle lecturer	MA Multidisciplinary Design Innovation	UK
6	Programme leader	MA International design and business management	Finland
7	Head of International Studio	MA Industrial Design	France
8	Senior Tutor	MA Product Design	UK
9	Programme leader	BA Industrial Design	UK
10	Programme leader	MSc Integrated product design	UK
11	Lecturer	BA Product Design	UK

These wide-ranging conversations aimed to explore the position of design in their institution, live issues for design educators today, and their thoughts on potential future challenges for curriculum design.

Methodology

Due to the early stage in the PhD process and the exploratory nature of the research objectives, a semi-structured depth interview approach was taken. An interview guide was prepared to provide a checklist of topics to be covered (Robson, 2011) with space and time for additional unplanned conversations. A summary of the interview flow was shared with each interviewee one week before hand.

Several interviews were conducted face-to-face, although the majority of discussions took place via Skype (owing to the geographic spread of locations). With the respondents' permission, each interview was audio recorded. Following the interview each recording was transcribed for analysis.

Once each interview had been transcribed, statements were then arranged under the interview guide's main sections (see Appendix for example). Looking across all 11 interviews then allowed statements to be categorised according to the grounded theory approach of 'open coding' (Robson, 2011) to identify a series of conceptual categories from the data. These categories helped to identify the main ways educators framed design education, current 'hot topics', and issues with curriculum design and delivery.

Findings

During interviews, there was frequent reference to the 'object' of curriculum design; that is the schedule of pathways, projects, lectures or modules that make up the academic year. However, despite probing questions by the researcher, there was little conscious awareness of the process by which these programmes models were created in the first place, or subsequently refined. Of the two examples mentioned, both were seen as exceptions to the normal year-by-year – largely tacit – process of curriculum refinement. For example a government-sponsored think tank tasked with creating a new model of design education in France (Educator 7), or a panel of industry experts being asked to provide independent advice on the future direction of a long-established industrial design programme (Educator 2) were rare examples cited of a visible curriculum design practice.

In the sphere of design practice, the language of innovation – and the distinction between incremental and or radical innovation – has been adopted to frame and describe the nature of change required by creative efforts (Christensen, 2013; von Hippel, 1995; Verganti, 2009). However, it seemed from discussions with educators that the processes of design or language of innovation often introduced in educational work with students, was not consciously thought of when they themselves create new programmes or make incremental refinements to existing ones. Referring back to Ünlu's work, the general sense of 'mystery' around the curriculum design process was reinforced, confirming the area as ripe for further study.

Conclusion

By developing an analytical framework to describe the range of disciplinary innovation across leading design schools it has been possible to gauge the level and nature of curricular innovation

implemented by institutions; from the majority of schools who have left the undergraduate framework of study largely untouched, to the large range of incremental or radical innovations being explored at post-graduate level.

However, from this researcher's review of literature and preliminary research with design educators (conducted as part of the early stages of PhD study), it appears that this language of innovation often introduced in educational work with students, is not consciously thought of by educators themselves when they are making incremental refinements to educational programmes, or conceiving completely new ones.

This investigation revealed both a general lack of research into curriculum design practice not only in design education, but within higher education in general. Moreover, although there have been tentative forays into research that explores the potential application of designerly ways of knowing and thinking in curriculum design, there remains little discussion of who curriculum design practitioners in design education might be, and what the future curriculum designer might look like.

As such the potential for future research is great; in constructing a broad base of empirical understanding about the formal and informal curriculum design practices at play in specific contexts where design programmes are being developed and developing a richer understanding of:

- Who curriculum designers are and who they collaborate with
- How curriculum design practices vary in different institutional contexts
- What artifacts curriculum design produces and how they function

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