3. Conclusions

In this research, a transdisciplinary synthesis and extension of design thinking was created, leading to a comprehensive and philosophically grounded "fit, stick, spread and grow" framework. Higher education teaching and learning is seen in a new light through this lens. The framework was built using insights from design research, architecture, innovation studies, computer science, sociology, higher education pedagogy studies, business studies and psychology. The research was further enriched and empirically grounded through case studies and design studies, in many cases co-developed with participant staff, students and alumni using techniques from "design anthropology".

In Part One of the thesis, the University of Warwick was explored as a supercomplex organisation, following Barnett (2000). Supercomplexity was shown to have positive consequences for individuals with already well developed design capabilities – in that they can more effectively exploit opportunities and create networks. But for the majority, it presents significant challenges. This creates a design divide which limits the spread and growth of innovations in teaching and learning. Part Two moved on to the positive task of creating a framework that examines and defines the nature of: design, designing, designers, designerliness and design capability – on both an individual and collective basis. Most importantly, the framework emphasises the value of people with the right *design capabilities* (built on skills, knowledge, techniques, values, attitudes and reflexivity) working in effective collaborations (at the right scale and scope) and through well designed and

maintained platforms (including the idea of "the University as a platform" introduced in 2.1.1). Process matters, but people make and maintain the process (learning from Pixar's approach, as described in 2.3.2). The research then considered challenges in managing design capability (especially *ad hocism*) and people-centric strategies for more designerly designing (including Design Thinking, the Thick Boundaries approach and practices from the creative industries). Throughout Part Two, the framework was applied to the task of rethinking the University and its production.

The **fit, stick, spread and grow** framework was shown to be a simple but powerful set of concepts for easing the transition to *designerliness by default* and more evenly distributed design capabilities.

Less positively, this research has shown that yes, as forecast by the likes of Barnett (2000), post-Browne and in the world of globalisation, digitisation and personal flexibility, the neo-Kantian University seems to be in trouble. It is not well equipped to deal with the supercomplex conditions that it has, to a significant extent, created. It sometimes reacts to disruptions by seeking to reproduce an organisational architecture and ways of working that are adaptations of Kant's 18th Century hierarchical design (in *The Conflict of the Faculties* – see 1.8.4). It does not have what Teece (2007) has called effective *dynamic capabilities*, and which I have shown are founded upon the *designerly capabilities* needed for success under such conditions (see 2.5 for Teece's insightful list of "microfoundations for dynamic capabilities").

The investigation found that:

a) The University of Warwick is characterised by a non-deterministic *emergent* growth of many and varied *artificial* forms and features. As described in 1.2, the history of the University began with bold design ideas handed-down through the intentions of an elite group of powerful agencies outside of academia. However, this took place just as the prevailing powers of British Industrial Capitalism crashed into almost terminal decline. The influence of these initial intentions quickly disappeared as the institution's many distributed and disconnected agencies took on a life of their own – often very productive and internationally significant lives – feeding into the overall success of the institution, but not conforming to a single simple design idea or socio-political agenda. Such diversity is not *a priori* a bad thing. It enables the kinds of flexibility, innovative thinking and action described in 1.3 (Student as Producer, Open-space Learning). In many ways the supercomplex University has been a precursor of the growth of supercomplex Platform Capitalism, and a *reflective practicum* in which we can learn how to live successfully, fairly and sustainably under such conditions – perhaps even pointing towards something beyond current political and economic regimes (the SIBE student collective being a good example of this, detailed in 2.3.4). We are, after all, affecting the formation of generations of workers and citizens who will still be active in fifty years time: 2065. In the years after Browne, there has been a resurgence of interest in a design idea for the future of the University, as presented by Vice Chancellor Thrift and the current redevelopment of the campus. This has translated into major building and development projects that have already made a significant mark

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on the shape of the campus landscape, but not necessarily yet upon the more extensive and less visible "learning landscape" of everyday teaching and learning (1.9.1).

b) The design history of the University may be recovered as a story of many periods of rapid growth, change and the reworking of places, systems, organisations, curricula and roles (for example the reworking of the History curriculum described in 1.9, and the images of "grafted-on" spaces in section 2.1.2 on assemblages and platforms). The long view is punctuated by the influence of government reviews and policy change. But perhaps now as the politicians' grip upon the definition and control of "the platform" in which we live our lives loosens, and the emergence of new platforms and powers accelerates, a new order is coming in to place.

c) The task of writing a design history is difficult, as a result of the widespread loss of institutional design memory – only now being recovered through oral history research or by accident. Such memories enable resistance to the imposition of unrealistic or undemocratic design narratives and big ideas. This might concern big details, such as the placement of buildings in the landscape. But small details can be just as significant – for example the memory of the value of sofa space for students needs to be cherished (1.9.4). The recovery of design history knowledge is critical to our collective future.

d) Despite the occasional times at which concentrated organisational change occurs, design agency concerning the where, when, how and what of teaching and learning is highly devolved – with teaching staff and students (through the different influences of Student as Producer

and flexible learning) taking more responsibility for decisions and in many cases producing fresh design innovations. This has been encouraged and accelerated by centrally funded projects and the growth of a "Warwick approach" – with the Reinvention and CAPITAL Centres (now IATL) playing a significant role in empowering students and teachers. Designerliness, and an appreciation of the value of design history and knowledge, was found to be more than usually strong in these initiatives (recall for example the interviews with Carol Rutter, Nick Monk, Paul Taylor and the pedagogic innovations of Cath Lambert and Ruth Leary in 2.1.2).

e) There are no consistent central points at which academic or managerial design agency and capability are collected and maintained by default – a complex committee system and a paper-form-based "quality assurance" process have dissipated and limited its growth and spread. Warwick also lacks a design school of any kind, through which the critical and creative force of design theory and research might be brought to bear on the development of the University.

f) Although there are many variations across the University, it is still largely divided between craft-collectives and the central administration, with the former loosely connected to the latter. Academics are often oriented more to resources and organisations beyond the institution. The diagrammatic representation of Scenario 3: "web sites create unstable and contested common ground", in 2.2.4 illustrates a compromise situation achieved through new technologies and media. The inventiveness of this craft activity may often be described as a form of *everyday designing*. But there is in reality much less

recognition of the designerliness involved in the work of students and staff.

g)   There is also a preference for *ad hocism* – a tendency to favour situations in which we can plan less and improvise more (the Open-space Learning approach takes this to the extreme). Campus-based academic activity finds its value in such live and unpredictable encounters. As seen in the cases presented from Theatre Studies and the Writing Programme, successful academics have crafted departmental places, spaces and cultures that enable exciting and emotionally enduring experiences, containing a high degree of *ad hocism*. Even where a highly specified curriculum is imposed from professional bodies (e.g. medicine) it is interpreted through the lens of individual creative-critical creativity and chance (as theorised by David Davies, see 2.2.2). Although Teece warns against *ad hocism* (see 2.5), in the higher education context it is not a bad thing in itself. Individuals may become highly adept at being responsive and inventive. And given the right conditions, *vertical diffusion of innovation* might flow productively between closely associated staff and students – producing designs that fit well locally and prove to be sticky over time. But this *ad hocism* does tend to fragment design dialogue across the institution (adding to the supercomplexity of the student experience), disrupting *horizontal diffusion of innovation* (reducing spread) and our collective capability for design innovation (reducing growth). These effects result in a reduction of the "…ability to integrate knowledge from external sources...architectural competence…" (Teece, 2007: p.1337) possibly even leading to "...bias, delusion,

deception, and hubris…" (*ibid.* p.1333).

h)   The tendency to *ad hocism* and the organisational history of the

University contributes to the continual production of diversity through

un-directed drift and conscious design innovation.

We might follow Barnett in describing the diversifying effects examined

(points *a* to *h* above) as "supercomplexity". If we consider designs as complex

assemblages of many components of different kinds, using the approach

outlined in 2.1.2, and if those components are increasingly decomposable

and reusable in the hands of active agents, then we can see both the source

and the effect of supercomplexity in the diversity of educational things that are

made in the University (and described in this thesis). Indeed as Barnett

forecasted in 2000, these conditions present increasingly difficult daily

challenges to individual members of the University (students as much as

staff) and to collective attempts at enhancing teaching and learning. The

"extraneous cognitive load" involved in negotiating supercomplexity is in itself

a major challenge (for example, labyrinthine web sites produced by

contending tribes across poorly mapped out and constantly shifting territories,

as described in 2.2.4).

A minority of already well-equipped individuals (staff and students) are self-

organising so as to exploit the many opportunities that have opened-up.

Diversity creates work! The E-Squad benefited in this way (see especially the

work of Catherine Allen detailed in 1.9.3). As seen in many of the cases

presented in this research, these already well equipped individuals bring

creative and designerly capabilities with them from outside of academia. They

are good at creating assemblages from the components made available by the platform (or multiple platforms interwoven together). They combine technical capabilities with imagination and creative strategies, including managed risk, storytelling, lo-fi prototyping, visual representation and networking (techniques shared with professional designers). They are able to understand and work with the unpredictable exigencies of events going between design-in-mind, design-as-experienced and design-in-use, in the every shifting dynamic of discovery, innovation, adoption, adaptation and reinvention. And most importantly, their designerliness is double: producing designs for achieving their goals, and at the same time producing an environment, an ecosystem, of designing (including platforms, networks, working spaces) that enables and enhances their designing.

One of the most fascinating characteristics of the University is the regularity with which talented individuals emerge *from almost anywhere in the organisation* (staff and students). But the unpredictable source of this stream of talent is itself determined by an unevenness in the distribution of *dynamic capabilities* – including the increasingly important (in a world of platforms) *design capabilities*. The University is not so much a "talent factory" (Ready & Conger, 2007) as a talent magnet, attracting and facilitating already capable individuals with the offer of *opportunity*, and retaining them until they generate enough personal strength to escape the pull of the institution. There is then a significant *design-divide* between this minority and the majority.

We should be concerned that an increase in flexibility (the where, when, what and how of teaching and learning), driven by technological developments,

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might exacerbate this supercomplexity, its challenges and the resulting design divide - for example, by removing the familiar pedagogical template of lecture-reading-seminar and replacing it with teaching and learning radically distributed across time and space (recall the painful transition from face-to-face to online learning, and Jon Dron's analysis, and we get a sense of how radical this can be – see 2.1.3 on functional designs, breakdowns and the imperative to design). Some people will exploit the changes well. Others will not.

At the same time, and often allied to technological change, the wider HE environment is subject to political and economic turbulence, to which those with highly-impactful design agency (controlling big budgets) are consciously responding and perhaps seeking personal gain. However, more advanced platform-centric developments are on the horizon that threaten the economic, social and political conditions upon which the University has grown: typified by MOOCs (see "Platform wars: distance learning and MOOCs" in 2.1.3), but in the form of the wild, self-organising, self-serving world of Platform Capitalism, even further from the grasp of conventional higher education.

The University is characterised in my findings by its lack of conscious strategy for developing and sustaining the design capabilities of the institution and its members. However, a small number of *guerrilla designers* are responding to changing opportunities by seeking more sophisticated design capabilities, through a more platform-centric basis, and consciously aiming to develop people as much as products. They seem clear on the fact that such platform-centric development must be designed to cope with the preference for *ad*

hocism, diversity and devolved design agency. They are still largely unrecognised and unsupported. But their voice is growing stronger.

The positive conclusion of this project is then that there are many people within the University, often isolated and without significant power, who do have well developed *designerly capabilities* – essential to the dynamic capability of the institution (2.3.3). Furthermore, some of these people are conscious of the need to collectively develop these capabilities through platforms and networks that facilitate other people. They are taking advantage of the many opportunities enabled by supercomplex and fast changing conditions – especially technological developments. And they are seeking to empower others to follow: guerrilla designers, joining up with professional designers or adopting-adapting approaches from professional design, and helping to grow everyday designers.

This is starting to look like the "designerly turn", but as yet such a turn is not at the core of the University. A lack of dedicated, sustained support for distributed participatory design capabilities means that design agency is degraded. The lack of dedicated *physical* design spaces of the kinds described by Tim Brown (2008) is a major blocker (2.3.3 on the Guerrilla designers solution and 2.5.4 on the IDEO approach). The continued diffusion of design agency through the committee system illustrates that the University is not yet a designerly institution at the core.

What can be done to go further, faster, before other platforms emerge that seriously threaten the University? The proposal, strongly supported by the

findings of this project, is that the **fit, stick, spread and grow** framework

provides a simple, more flexible, easily applied set of concepts through which

we can all describe, understand, evaluate and, most importantly, enhance the

institution's collective design capability. Most importantly, using it balances

the four essential aspects. As with the Design Thinking of the IDEO company,

it is not intended to be another "design process" or a "project management

template". It is a set of pointers, drawing attention to four essential

dimensions in reflection and action through design.

The **fit, stick, spread and grow** framework presents a means for looking

beyond supercomplexity to shared values immanent to designing and design

agency in the University. It provides concepts, tools and the essential shared

language upon which the University may become *designerly by default*. It

helps designers of all kinds (everyday, guerrilla and professional) to clearly

state and question the aims of designs and design changes – do they fit with

people and their developing needs? How are the needs of different individuals

balanced with each other now and over time? With these questions more

clearly raised into the collective consciousness, more sophisticated design

methods such as Birger Sevaldson's *thick and thin boundaries* and Jonathan

Chapman's *emotionally durable design* can be introduced. The framework

considers what it would take to change and sustain new behaviours enduring

over time with an appropriate degree of stickiness and flexibility, again

leading to a clarity in understanding the challenge and the use of more

sophisticated levels of analysis. The two additional dimensions that help us to

care for and develop design capability are: spread – which considers the

wider impacts and usefulness of designs, and their reusability beyond our

local case; and grow –how the characteristics of design changes undertaken now can make it easier to successfully design in the future. Such higher level community or platform centric considerations then may work as the basis around which less fragmented designerly networks are formed across the whole institution.

Postscript: the Extended Classroom and students as design consultants

My own practice as an academic technologist has been fundamentally transformed by this research. In February 2015, with many academics still recovering from the Research Excellence Framework (REF) evaluation process, a collaboration of professional and guerrilla designers from across the University designed and implemented the Extended Classroom initiative, applying the fit, stick, spread and grow framework. The idea of the Extended Classroom *reframes* learning technologies and flexibility-enabling techniques for the specific context that is Warwick: predominately face-to-face and campus based, *ad hocist*, and facing problems of scale (increase in numbers), scope (increase in the diversity of its activities) and expectations (in a global marketplace with every detail of the Warwick experience exposed via social networks) – supercomplexity. The Extended Classroom is explicitly *not* about distance learning, a more usual starting point for learning technology developers. It is framed as being appropriate to a campus oriented University with *ad hocist* tendencies. This reframing of learning technology is the result of a more sophisticated and reflective dialogue concerning *fit*. We have recognised the contrast between a minority of "usual suspects" or "early adopters" who have been constantly demanding fresh

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innovations, and the majority of people who prefer to *stick* with enduringly familiar, comfortable and effective practices. We began by *re-describing* a small set of generically useful learning technology services (tools and platforms wrapped into service provisions). For each of these we proposed clear and meaningful *value propositions*. For example, for the Lecture Capture service: "Listen again, understand more". The first step was to take people beyond *awareness* to *recognition* linking technology and innovation to their own practices, ambitions, values and needs. The existing design consultancy and service provision would then be available to assist people in adopting-adapting practices and innovations, which would *spread* more evenly to more everyday practitioners. And furthermore, *spread* and participation in the design dialogue concerning the development of future services and practices, would be accelerated as many more people moved from mere awareness to being *informed advocates*.

We described this approach to senior management as an "organisational learning and design loop" (using the diagram included below) – a key lesson learned in this research project has been the need to see "organisational learning" (or the production of design knowledge and design values) as inseparable from designing. It is a kind of positive feedback loop that results in the design and re-design of "The Platform", which in this case is the University as an Extended Classroom, bringing together the wider learning landscape, learning spaces (physical, digital and blended), learning designs and curriculum designs. However, progression around the loop should also build networks and communities of designerly practitioners, engaged in the design process. Adoption/adaptation must, to make this work, lead to

continuation/reflection (as in the diagram) – not just use, but continual designerly reflections and reflexivity concerning use. This needs to be facilitated well, becoming habitual for the organisation. The IDEO Design Thinking process, with its emphasis on building design capability for the long term (beyond individual projects) is essential to this. Only when participants are able to advocate designs (or suggest design changes) based on this design knowledge, gained through practice and reflection (the double-loop learning described by Chris Argyris, 1977) will we have well-informed advocates and design participants. Three months into the Extended Classroom initiative (April 2015) and the loop is starting to take effect. The latest development has seen a collaboration between Academic Technology, the Learning and Development Centre, the Students' Union, the Teaching and Learning Grids, the Institute for Advanced Teaching and Learning, Careers and Skills and several academic departments (including Centre for Lifelong Learning, Life Sciences). Our collaborative project is entitled "Supporting Learning and Teaching Champions in Enhancing Appropriate Flexibility". The "champions" are students, working in the style of the E-Squad and Life Science's Digichamps team, to accelerate the loop further. The HEA funded part of the project will fund a team of students to co-design a "competency framework" for students working on such projects. Design thinking and the fit, stick, spread and grow framework will be essential to what they do.

And finally

Undertaking this research has been an extraordinary experience, at a vital moment in the history of the University and higher education more broadly. Its

impact on my own practice and "world view" has been significant and positive.

Its impact on the University, as described above, will continue for some time.

The Organisational Learning & Design Loop

Recognition → Sufficient understanding → Adoption/adaptation → Continuation/reflection → Informed advocacy → Design participation

Awareness → Recognition

Platform design → Awareness

"The Platform" gets refined and extended.

Platform development around good learning designs.

Draws more people into the loop - but they are better informed, and participating for the right reasons.