PROFESSIONALISM AND BEYOND: BUILDING COMPETENCE AND EXCELLENCE IN PRODUCT DESIGN

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ABSTRACT

The UK-SPEC document considers the development of competence in engineers at all levels. This is largely an operational competence, couched in non-specific terms. It is vital that educators develop curricula to address the issues of the development of competent life skills. But it is also essential that designers go beyond competence and seek to attain excellence, usually within their professional life rather than earlier. This development will require significantly more support than is currently provided.

Keywords: Competence, Excellence, Professionalism

1   INTRODUCTION

Within UK tertiary education the teaching and learning emphasis seems to be upon allowing students to take control of their own learning. This is evident in the London South Bank University student recruitment campaign focusing on the motto "Become what you want to be" – with the emphasis on being, not simply doing.

While this emphasis is certainly not perceived to be misguided in itself, the manner in which it is interpreted is somewhat narrow, resulting solely in an emphasis on the provision of distance and e-learning modes of class delivery and support to the detriment of what might be termed the development of the full person – the 'being' person rather than the 'studying' or even the 'doing' person.

There is a similar emphasis at the University of Derby, with the strap line 'Fit Learning into your Life' used to mean study from home, work breaks, while travelling or from regional outreach centres. Further, there is a growing importance placed on work-based learning, allowing individuals to negotiate their own unique qualification route. This approach is useful but there is the potential that students miss out on those interpersonal skills developed while mixing with their peers on campus, so essential for professional product designers who by necessity have to work in teams.

The more pressing need therefore is to determine and meet the requirements and needs of this full-rounded individual, 'being' person, rather than simply focusing on the limited knowledge transfer process, important though this is. The environment for teaching and learning at all levels in the UK education system, from schools to University, is changing rapidly. Arguably some disciplines are insensitive to the direction of these changes, but by concentrating on knowledge transfer this is at the detriment of output of product design courses and the quality of young designers ready to enter the profession.

Part of the problem arises from the fact that design and technology is considered to be neither a specialist art nor a specialist science. It is deliberately and actively

interdisciplinary. It is a creative, resistive, itinerant, non-discipline. The changes in the education system are therefore contra to that needed for product design. We urgently need to reclaim the high ground.

2 DESIGN FOR COMPETENCE

Being a professional is exactly that: it has to do with the development of skills that have to do with 'being', rather than acting in a practised or particular manner. The first step in the formation of any professional is to achieve a level of competence, and this is certainly true for the profession of designer.

At a lower and more general level, this is exactly what the RSA is trying to do with their Curriculum for Competence, aimed at secondary schools. This sprang from the realisation that there was a huge gap between the UK's National Curriculum for schools and the real needs of secondary school children. It aims to meet those needs of developing young people so they can survive and succeed in life [1]. This curriculum is couched in five areas that are felt to be central to competence as a citizen: learning, relating to people, and managing situations, managing information and citizenship. These are, of course, general and are not specific to competence within a particular profession. Their purpose is to enable school leavers to be able to succeed in life. More specifically, the Engineering Council in a special paper spells out the distinctive contribution that design and technology makes to the school curriculum [2]. Importantly, these approaches need to go continue beyond the school years.

The next life stage is to develop competence at degree level. Currently there is little existing specifically at this level, but there are a multitude of individual learning outcomes in a variety of specialised areas and a significant attempt at defining what is meant by life skills. These tend to be achieved using specific, short pieces of work such as coursework exercises and examinations, although in design there are significant larger and more interdisciplinary project components.

Beyond tertiary education, the UK Standard for Professional Engineering Competence (UK-SPEC) [3] talks much about the levels of competence required to achieve the different grades of membership of the UK engineering register (Chartered Engineer, Incorporated Engineer and Engineering Technician), but the issues are dealt with in a different manner to the way the RSA has done.

In order to effectively deal with these issues University curricula need to change. Both the RSA curriculum and the Engineering Council competencies are framed around the provision of generic skills and abilities. Competency does not simply deal with knowledge transfer or with skill development, but with developing all-round individuals that are capable of engaging usefully within society, and in this specific instance, are capable of engaging usefully as designers within society.

The first major section of this paper looks at ways in which curricula need to change to encompass this sea change. It looks at ways of identifying key competencies needed by product designers [4] and the development of a framework to incorporate them.

2.1 Ways of identifying key competencies for product designers

Attenburrow [5] started the process by investigating job advertisements. Whilst these outline requirements in a concise manner, but they may not supply the most useful information, and tend to leave unsaid points that are simply assumed or covered by overarching terms such as 'professional' or 'qualified to degree standard'. They do, however, highlight that many of the competencies required are those that pertain to the life skills identified by the RSA and those outlined in the UK-SPEC.

The generic threshold competence and commitment statements defined by UK-SPEC are appropriate pre-requisites to a broad range of engineering industries. However, the professional work of designers tends to be much broader, covering a range of disciplines, industries and situations. The knowledge base of designers is significantly more diverse than that of engineers, and is based less on mathematical processes and more on methods for the synthesis of new and altered items.

2.2 Development of a framework to incorporate the competencies

In conjunction with UK-SPEC, the IED is in the process of developing criteria as they relate to the design professions, specifically to product and engineering design. However, it is recognised that these criteria are likely to be open-ended, interdisciplinary and generic in character.

Whilst the contents of the UK-SPEC document are useful and can generally be read across into the design profession from engineering, there are a number of differences and a change of emphasis to make the major rather than the minor content that of design rather than engineering. These key competencies will be related to life-long professional development rather than the narrowness associated with an undergraduate degree course, and will be couched in terms similar to those within the UK-SPEC document.

Probably one of the key requirements is that the professional will need to have developed an intrinsic model for the development of their competencies, from the necessity to have a coherent world view and even belief-system down to the way in which everyday actions are taken.

The development of this approach starts by the understanding of a concept such as the thought-action continuum as described by Petty [6].

This simple concept was originally conceived by Petty as a method of providing clarification in a problem-solving situation, but it may be successfully applied in the development of an individual. It investigates motives and methods – or, as in the diagram, ends and means. If these are intrinsic ones, the process of individual development becomes a matter of the provision of facilities for an individual to flower and develop. This is similar to the concept of *reflective learning* pioneered by Schön [7], although the term *personal development* probably describes the concept more accurately.

The headings listed within the UK-SPEC document [3] are couched in very general terms, and the five major ones consist of the following:

A	knowledge and application of technology
B	engineering methods / problem solving
C	leadership / management
D	interpersonal skills
E	professional standards

Little change is required to translate them into a relevant set of areas for ALL design disciplines, including those such as graphics and book illustration.

The RSA's list of competencies are broader in scope, dealing with issues such as *how* to learn and develop generic skills, rather than *what* to learn and *which* skills to develop.
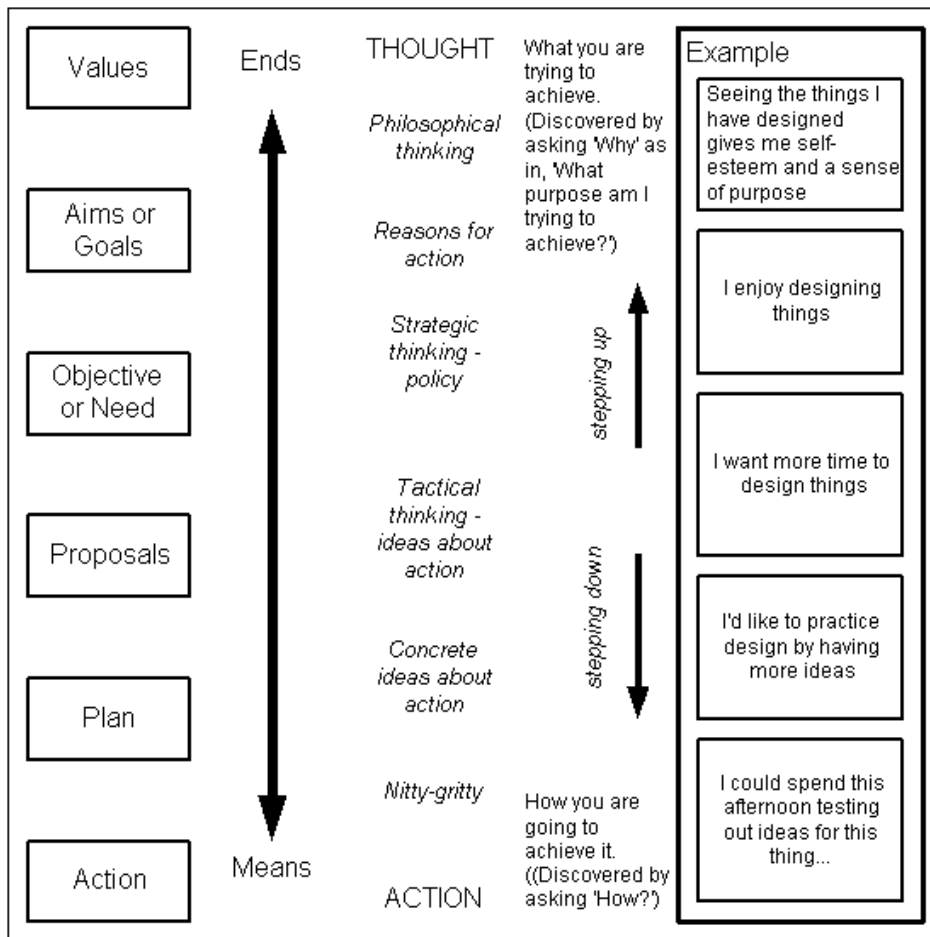
Figure 1. Thought-action Continuum (after Petty)

3   DESIGN FOR EXCELLENCE

Whilst most of our work as educators will be to develop a level of competence across our course output, we need more than that. Professionalism is significantly more than education, and needs to be part of the life beyond for graduates. We need to develop excellence as the pinnacle of professional achievement and in our relationships with industry, the receiver of the output from our courses [8]. This could possibly be by the provision of training courses, but is primarily by the developing long-term relationships such as can be provided by professional membership of the Institution of Engineering Designers (IED), particularly as this continues throughout professional life.

Competence relates to a specific level of achievement related to the individual's stage in their life process. This applies both to the level of graduate achievement and also to that at the appropriate professional level. The maintenance of competence should not be in question: what comes beyond the achievement of professional competence should be a personal quest for excellence – with the rather obvious proviso that this is never actually achievable. Once a professional level of competence is reached this becomes an important threshold, but just as the UK-SPEC competencies are written in terms of

lifelong and continuous improvement and just as the terms 'new' and 'emerging' alter, develop and change with time, so the designer's goals alter, develop and change. Excellence becomes the quest to achieve, not a status quo, but a moving target that by its nature can never be actually reached.

Excellence therefore needs to be developed in an intrinsic manner, as much of this quest will need to be done without the direct aid of a provided instructor or educator. Those engaged in the quest need to have developed the generic skills – largely those within the RSA list of competencies – that enable them to go beyond the formal educative process. This can be through a number of specific methods. These include generic ideas, but may also be achieved through some concrete methods. These can be through the provision of role models [9], developing ideas based on mastery [10], the use of competitive training principles [11]. They will be couched in terms of the real world (rather than the false distinctions common within education)[4] and will undoubtedly include the influence of industry [5].

3.1 The concept of excellence

Excellence is not particularly difficult to define in terms of a dictionary definition. It is simply described as being extremely good and outstanding [12]. However, it is particularly difficult to determine exactly what constitutes excellence in the same way that it is difficult to determine what good design is: it can only be described in terms of its contrast with what is not excellent, as a league above the simply competent.

Excellence may be perceived not simply through rational means, but that a degree of emotion and feeling is involved as well. Frequently those who seem to reach this position possess not simply an intrinsic motivation and enthusiasm, but it would not be too far-fetched to describe their attitude as one of love for what they do.

3.2 Ways that excellence can be encouraged

How to inculcate this excellence is not necessarily obvious. Developing emotion and feeling for things may not seem a necessarily sane behaviour, but could be important for the development of excellence. Even at undergraduate level students can be encouraged to engage as fully as possible with their emotions for products – even those that function unobtrusively and repeatedly.

3.2.1 Provision of role models

Role models are extremely important. And of course, they should be enthusiastic, capable and themselves excellent designers. The product design profession, particularly an engineering-based one, is still relatively recent although many seem to cite Leonardo da Vinci as one of their models – as a Renaissance Man, no doubt, and an inspiration for those who wish to link the arts and sciences together. The modern nature means that one cannot rely on a significant academic tradition of excellence to any extent, and the role models have to be gathered from almost contemporary culture and examples. Books such as Barker and Harding's *Automobile Design – Twelve great designers and their work* [13] can prove particularly influential in this context.

But role models come from many sources: culture, family, graduates, lecturers, other students and even perhaps products. It is clear that the influence of a role model goes beyond their physical presence: some graduates, for instance, return to their degree shows several years after successfully completing their courses, not just to pay their respects but because they appreciate their lecturers. Some chance remark may come out

at these encounters indicating perhaps a brief word that gave the individual the ability to see themselves as an achiever and to provide them with intrinsic motivation.

3.2.2 Concept of mastery
The Japanese have a concept of mastery that relates to the development of excellence. It relies on the process of copying of the master's work in minute detail, with the aim that in doing so the pupil (or copier) starts to comprehend exactly how it was that the master's mind, abilities and emotions were developed. It is an effective way of learning, but one that Westerners have not employed to the full. It relies on a pre-existing model of something that is considered excellent – an ideal to aim for. But it does not stop with the successful achievement of a minute copy. Mastery needs to continue, combining excellence from several masters to create a new standard.

3.2.3 Competitive training principles
Dyer [11] introduced the topic of competitive training principles in design using the analogy with the development of sports psychology. In sports, what is important is not being competent, but being excellent. To be the winner and not second. This is clearly the preserve of excellence of an extreme nature, where only a very limited number of prizes are given. Dyer suggests that the psychological principles developed for sports excellence need to be carried over into a set of psychological principles for design excellence. He indicates that these come in four stages: preparation, arousal and priming, assault and evaluation, and that at each stage several techniques are appropriate. However, whilst most sports achievements are in a series of short bursts and are physical, those in design tend to be longer lasting. But he suggests that the being at the peak of the pyramid is not a sustainable position. The design professional may have a longer-lasting peak than the sports personality.

3.2.4 Influence of industry
Developing professional competence derives from two main sources, education and professional development. Education provides the underpinning knowledge and understanding. Learning how to apply the acquired knowledge and understanding and the exercising of professional judgement arise from professional development, mostly obtained after graduation through employment. This process regularly begins prior to completion of formal education via industrial placements and increasingly alongside part-time study while working. Upon graduation, engaging in a structured graduate training and development programme is the most effective way of assisting graduates on their way to professional registration. Pivotal in this process is the role of the Engineering Council (EC(UK)) in regulating the engineering profession, through licensed Professional Engineering Institutions who accredit degree courses and initial professional development programmes as routes to becoming a registered engineer [3].
Clearly, the responsibility of both education and industry in the formation of qualified competent engineers, designers included, is critical. Employers, who do not run accredited schemes, can still develop competence profiles using occupational standards or competence frameworks for staff development. Alternatively, use can be made of the generic competence and commitment statements provided by the Engineering Council, and then approaching the relevant professional institution to obtain help in developing competence profiles. In the case of product designers, the most appropriate professional institution is the IED.

Maintaining professional competence is as important as acquiring it in the first place. Continuing professional development (CPD) is about planning and maintaining up to date competences, working within professional codes and actively participating in the profession. This will be a function of the occupational standards of the employing organisation's industry and the personal career aspirations of the individual engineer or product designer. These will vary with changes in role and employer, but the need to plan and maintain professional competences remains, with CPD ensuring continuity from job changes.

4 THE WAY FORWARD

This paper is speculative and therefore deliberately inconclusive, presenting a range of methods and processes for change. It is concerned with opening possibilities rather than with presenting a particular application.

Firstly, the development of competence at University level relies on the use of less formulated requirements and more interdisciplinary developmental tasks, with, in the case of design, students being free to develop their own expressions of professional competence. The continuation of this competence to become a professional competence also relies on the interdisciplinary nature of the individual and the way in which that individual develops personal qualities of being.

Beyond the competence level, there should be a perhaps elusive, moving target of developing excellence, through the pursuit of such techniques as mastery, sports training and so on. This is obviously a lifelong quest.

There is a significant need to develop excellence beyond the level of tertiary education, throughout the designer's professional life. It is hoped that it will stimulate further discussion and as a result a succession of curriculum developments to facilitate life professional development. To be successful operationally, it needs to draw in industrialists and educators working together, but more importantly open-minded policy makers in governments and those connected with business and commercial enterprise.

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