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FOSTERING PROFESSIONALISM

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ABSTRACT
The professional instinct isn't easy to instil in inexperienced students in any field. In sport, to be professional means being good enough to be paid to take part. Professionalism, in most careers, requires expertise of a standard acceptable to other members of the profession, and that each individual accepts responsibility for the results of their decisions.
Professions are usually overseen by membership bodies, which act to define and maintain standards. They also have a learned society role in holding conferences and publishing journals and papers. In some fields, being a member of such a body is a legal requirement in order to have a licence to practice. Except in certain specialist roles, designers have no current legal requirement to belong to a professional organization in the UK. However, there is legislation which does impose direct responsibilities on individuals and their employing bodies for any unfortunate consequences of design decisions, making membership of a professional body a prudent option.
Undergraduates often have only a vague concept of professionalism and the role of a professional body in setting standards. They have come from a school environment, where passing exams was the measure of achievement, rather than the long term acquisition of knowledge and understanding in applied in a responsible way. This paper will explore the concept of design professionalism and ways of appreciating it for the novice.

Keywords: Human Technology Relations, Design Curriculum, Project Based Learning, Technological Mediation

1 INTRODUCTION

Education beyond secondary school level can be considered under two headings: those courses which provide further knowledge and understanding of a particular field, perhaps leading on to research or a specialist career in that field; and those which are intended as a preparation for a particular career path often with a range of application. These latter courses are frequently certified by an official body or professional system, which maintains the relevance of courses to currently acceptable professional practice and projections of future need. For particular skill areas, most countries have a system of certificates and diplomas, less analytical than degree courses, which are focussed on application and practice. Degree courses include the deeper understanding of a basis for decision making, with appropriate links to management and business.
Within the design spectrum, the Engineering Council was established by Government in 1981 in response to the Finniston Report, "Engineering Our Future" [1], which focussed on practical application. Although the word "design" was hardly used in the report, Sir Monty Finniston agreed later that the design activity was at the core of their recommendations. As a result of this report, the government set up the Engineering Council as the licensing body for the profession. Engineering qualifications in the UK are comprehensively covered by 36 professional bodies licensed by the Engineering Council to set specific standards for their field, meeting the Council's more general requirements. These include a specific reference to design as a major component of initial professional development.
Their original professional requirement, "Standards and Routes to Registration" (SARTOR), took up the main conclusions of The Design Council's Moulton Report [2] that "all engineering should be taught in the context of design and design should be a thread running through the course." A joint Design Council-Engineering Council was set up in 1989 to add more detail, and their report [3] influenced the early recommendations for Codes of Practice. The relevant statements of competence from this report are given in Appendix A.

In the field of product design, the situation is less defined. There is no equivalent of the Engineering Council, so the various membership bodies each set their own standards. The Chartered Society of Designers, CSD, has had the right to award a "Chartered Designer" title for several years, but, at the time of writing, was still defining the requirements, with the expectation of awarding the title in the near future. More recently the Institution of Engineering Designers, IED, has established the title of "Chartered Technical Product Designer", CTPD, awarded in their own right under their Royal Charter. The IED has accredited product design courses for some years, but has not had a professional title to award. They are setting up a system, based on their engineering experience, to make the title available to their qualifying members. This is progressing towards final approval by the Privy Council later this year.
Other countries have their own professional systems, which have evolved historically in different ways. A variety of international agreements are in place to allow professional qualifications to be recognized across borders, even though the methods for obtaining them may vary considerably.

2 DEFINING PROFESSIONALISM

Professional bodies usually define professional behaviour through a "Code of Practice" or "Code of Conduct". Although often used interchangeably, these terms have slightly different meanings. The first implies a responsible attitude to the methods of applying professional expertise; while the second refers to the underlying motives and behaviour of a professional. However expressed, the results should be similar. The content and interpretation of these codes changes as new thinking generates a different emphasis. For example, in recent years an additional priority has been give to environmental responsibilities as the effects of global warming have become more apparent.
The Engineering Council's UK-SPEC [4] guidance on Codes of Conduct for engineering professional bodies reads:
Codes of Conduct should oblige members to:

1. Act with due skill, care and diligence and with proper regard for professional standards.
2. Prevent avoidable danger to health or safety.
3. Act in accordance with the principles of sustainability, and prevent avoidable adverse impact on the environment and society.
4. Maintain and enhance their competence, undertake only professional tasks for which they are competent, and disclose relevant limitations of competence.
5. Accept appropriate responsibility for work carried out under their supervision.
6. Treat all persons fairly and with respect.
7. Encourage others to advance their learning and competence.
8. Avoid where possible real or perceived conflict of interest, and advise affected parties when such conflicts arise.
9. Observe the proper duties of confidentiality owed to appropriate parties.
10. Reject bribery and all forms of corrupt behaviour, and make positive efforts to ensure others do likewise.
11. Assess and manage relevant risks and communicate these appropriately.
12. Assess relevant liability, and if appropriate hold professional indemnity insurance.
13. Notify the Institution if convicted of a criminal offence or upon becoming bankrupt or disqualified as a Company Director.
14. Notify the Institution of any significant violation of the Institution's Code of Conduct by another member.

All of the professional bodies holding Engineering Council licenses base their individual codes on this. Product design bodies could be expected to adopt equivalent codes. By joining a professional body, a member is agreeing to abide by these codes.
Interestingly, a recent review of the UK National Health Service introduced the concept of a "Code of Candour" covering the need to give patients, and their relatives, a full and transparent picture of the prospects of potential courses of treatment and to involve them more directly in the decision process. An equivalent emphasis on the closer involvement of stake holder groups in the design process might be a future development of designer responsibilities.

3 INTERPRETING THE CODES OF CONDUCT

In interpreting the various codes, concepts such as "professional integrity", ethical behaviour", "honesty and transparency", and "long term responsibility" are clearly key to understanding them. This is in addition to maintaining the currency of standards of expertise, which means an enthusiasm for CPD. The pragmatism necessary in design means that compromise is part of professional considerations. However the professional codes cannot be part of the compromise. If no acceptable solution can be found, the reasoning behind the original design concept must be called into question.

The codes require that a professional should maintain a standard of integrity, even if asked to go against their judgement by a client or manager. This puts a requirement on employers to accept that their professional staff have this obligation. Ideally, professionalism, particularly ethical behaviour and a striving for the best solution should become instinctive. It also implies that a professional should be able to rely on other members of the team to apply similar standards.

4 LEGAL ASPECTS

In the UK, except in certain cases, there is no general legal requirement, in product design or engineering, to belong to a professional body. However, the Consumer Protection legislation of 1987 places the responsibility for any damage "caused wholly or partly by a defect in a product" on the producer, or importer, of the product (see Appendix B). Any defence to a charge under this act would depend on the producer identifying the suitably qualified person, who made the decision on the design of the feature which caused the damage. The basic defence would be that any other professionally qualified person could have made a similar decision with the "state of the art" at the time. The defence would fail if the person in question was not suitably qualified, usually demonstrated by membership of an appropriate professional body. More recent legislation on corporate responsibilities has emphasized this point, but none of this has been fully tested in court.

Professional responsibility for a decision affecting a product nominally lasts for the lifetime of the product in service. With current developments emphasizing design for the re-use of products or components perhaps several times [5], the question arises as to where responsibility lies if a re-used component fails. Is it with the original designer, or the person or organization that put it back into service? There may be a requirement for records to be kept detailing design decisions, and the reasoning behind them, along with records of manufacture, maintenance and use, in order that end-of-life decisions may be made with more confidence [6]. It is worth emphasizing that the legislation on design responsibility applies across the whole design spectrum.

5 IMPLICATIONS FOR COURSES

It is particularly difficult for inexperienced students to appreciate many of the basic aspects of professionalism. However, such concepts are rarely included in any industry based training or experience, where the emphasis is more likely to foster loyalty to the company and its aims. That can inadvertently provide justification for compromising the integrity the profession emphasizes. Therefore it has become more important that professionalism is strongly promoted in the academic phase of initial formation.

One aspect of engineering professionalism falls on the academic staff involved in teaching courses. A young graduate cannot be expected to have expertise in a topic if it was not given sufficient emphasis during their course. Thus subject areas should not simply be included because a professional body requires it, but because without it a graduate will not be fully competent. The course provider, as well as its accrediting bodies, could be criticized if a novice practitioner does not have a reasonably expected competence or the professional attitude to apply it diligently, if there are unfortunate consequences. This applies particularly in engineering courses.

The considered use of factors of safety and risk analysis, along with a full appreciation of the responsibilities of design decisions, should feature as an explicit part of any design course as well as being implicit in all project work. All design students should undertake at least one design project where there is a clear inherent danger in using the product. For example: this may be a simple kitchen device for chopping or slicing vegetables or a complex manufacturing process where operatives work alongside fast moving processes. Projects could involve devising test procedures for extreme operating

conditions or to avoid operator error. The layout of controls and instrumentation for safe operation or avoiding operator fatigue provide more options for projects.
One illustrative source of professional practice is the extensive sets of national and international standards. Great care is taken in compiling standards by appropriate experts with a depth of experience in the field under discussion. Draft standards are published for critical assessment before they become active. In the UK, all British Standards are periodically reviewed and updated to keep them current. Most standards do not give the reasoning behind their statements, but they do represent good practice and the advantages of a common understanding. Students should include an investigation of relevant standards as part of their background research at the beginning of a design project. They should also be familiar with the documentation standards [7], which ensure that the results of the design activity are correctly interpreted during the manufacturing process, wherever it takes place.

6 NOTE

Although I have drawn on my long involvement with course accreditation and membership interviews for both the IED and the IMechE, and in the preparation of standards for BSI, this paper is a personal view and does not reflect these body's policies.

REFERENCES

[1] "Engineering Our Future" (Finniston Report) 1980, Department of Industry. London: HMSO.
[2] "Engineering Design Education" (Moulton Report), 1976, The Design Council.
[3] "Attaining Competence in Engineering Design" (ACED), 1991, The Design Council.
[4] "UK Standard for Professional Engineering Competence" (UK-SPEC), 3rd ed. 2013, The Engineering Council.
[5] For example: BS 8887 "Design for Manufacture, Assembly, Disassembly and End-of-Life Processing (MADE)", ongoing series, British Standards Institution.
[6] Guidance on this will be available from BS 8885 "Information Management in the Product Life Cycle" (draft title), to be published, British Standards Institution.
[7] BS 8888-2013 "Technical Product Documentation and Specification", British Standards Institution.

APPENDIX A – Attaining Competence in Engineering Design, 1991

The joint Design Council – Engineering Council report, "Attaining Competence in Engineering Design", encapsulated professional responsibility as follows:

2.1.3 ACCEPTING ENVIRONMENTAL RESPONSIBILITY

Chartered Engineers should

- Be able to explore and take into account the interactions between a design, the environment, and the quality of life of those involved in its realization and operation or only incidentally affected by it. (Including predictable accidents and failure modes, and, where appropriate, waste products, noise, and visual aspects, during realization, storage, transport, use, and the ultimate disposal of materials.)
- Appreciate collective and individual professional responsibilities for environmental protection.
- Be familiar with relevant environmental legislation and the likely public and political perceptions of design features.

2.2.3 ACCEPTING PROFESSIONAL RESPONSIBILITY

Chartered Engineers should

- Have an attitude of responsibility towards the safety of user's colleagues, employers, and society.
- Possess personal integrity, a responsible attitude towards decisions, and pride in good practice.
- Never consent to incorporate features in a design, which mislead as to its true worth.
- Be familiar with standards and codes of behaviour acceptable to their professional bodies.
- Understand the need to maintain and develop expertise, both for their current task and their future career, by undertaking a programme of further study or training.
- Appreciate the historic and cultural development of relevant technologies and their relation to existing products and market expectations.

Today, a statement on design for further use or material recovery would probably be added to the environmental requirements.

APPENDIX B - UK Consumer Protection Act 1987 (Excerpt)

2 LIABILITY FOR DEFECTIVE PRODUCTS

(1) Subject to the following provisions of this Part, where any damage is caused wholly or partly by a defect in a product, every person to whom subsection (2) below applies shall be liable for the damage.

(2) This subsection applies to

(a) the producer of the product;

(b) any person who, by putting his name on the product or using a trade mark or other distinguishing mark in relation to the product, has held himself out to be the producer of the product;

(c) any person who has imported the product into a member State from a place outside the member States in order, in the course of any business of his, to supply it to another.

(3) Subject as aforesaid, where any damage is caused wholly or partly by a defect in a product, any person who supplied the product (whether to the person who suffered the damage, to the producer of any product in which the product in question is comprised or to any other person) shall be liable for the damage if—

(a) the person who suffered the damage requests the supplier to identify one or more of the persons (whether still in existence or not) to whom subsection (2) above applies in relation to the product;

(b) that request is made within a reasonable period after the damage occurs and at a time when it is not reasonably practicable for the person making the request to identify all those persons; and

(c) the supplier fails, within a reasonable period after receiving the request, either to comply with the request or to identify the person who supplied the product to him.

(4) Neither subsection (2) nor subsection (3) above shall apply to a person in respect of any defect in any game or agricultural produce if the only supply of the game or produce by that person to another was at a time when it had not undergone an industrial process.

(5) Where two or more persons are liable by virtue of this Part for the same damage, their liability shall be joint and several.

(6) This section shall be without prejudice to any liability arising otherwise than by virtue of this Part.