

Getting Out of the Sheep Pen: New Directions in Architecture Education

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INTRODUCTION

The Royal Australian Institute of Architects is currently reviewing its Education Policy. This Education Policy, among other things, defines the criteria upon which architecture course recognition and accreditation is determined in Australian schools of architecture. In order to review this policy, and to set criteria for the future pattern of education leading into the 21st century, it is necessary to assess the future role of the architectural profession.

Reference has been made during this process of review to the Boyer and Mitgang Report from the United States,¹ the accreditation criteria of the NAAB in the US² and the Validation Criteria of the Royal Institute of British Architects.³ The UIA/UNESCO Charter of Architectural Education! dated April 1996, has been received and supported as a major reference in presenting the case of architectural education to a Federal Government review of higher education (the West Committee review).⁴

In April 1996 a small meeting was held of leading academics and practitioners to brainstorm the issues facing architectural education, and this meeting identified four major trends and two major tensions. The first major trend is Internationalization, which will see the greater mobility of architects and architectural education around the globe. The second major trend is "Technologization" which will see major changes in the technology of the realization of human settlements and buildings and in the way that architects will work in the design and communication of these projects. The third major trend is "Ecologization" which will recognize the growing challenges relating to human habitation on the planet, and the part that architects will play in addressing these problems. The fourth major trend is "Interdisciplinization" which will see even greater reliance on collaboration and team playing within and between professions.

The first major tension is the need for "speculation" in universities and the drive by university authorities for increased research output directed at greater publication. The second major tension is the ongoing demand by the profession of architecture that the architecture schools produce competent graduates who are immediately equipped to work in the profession. These tensions may reduce the participation of practicing architects as teachers in the universities and may create a greater gap between the universities and the day to day practice of architecture.

In Australia, the Federal Government has in place a process for the surveying of graduates, called the Course Experience Questionnaire, operated by the Graduate Careers Council of Australia.⁶ This organization conducts a survey of all graduates from all universities from all discipline areas each year and publishes results identifying the relative performance of each discipline area and the universities with courses in each area. The architecture schools can see the outcome of the responses from the graduates from all courses in

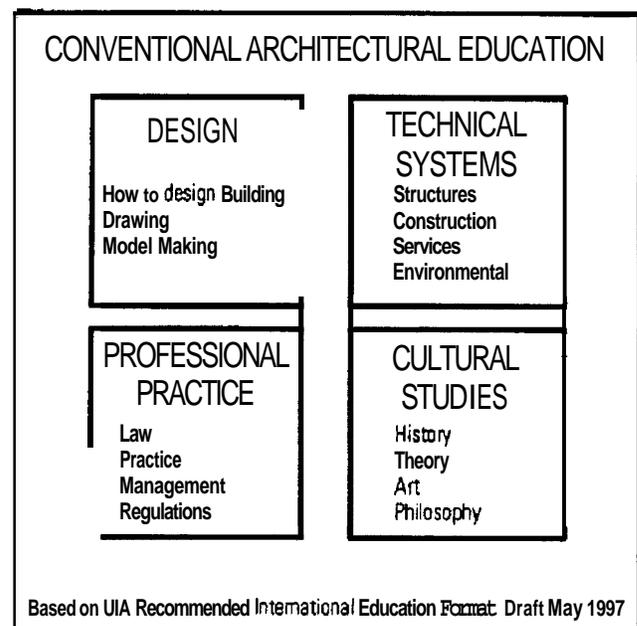


Fig. 1.

architecture. The survey is conducted under six headings — quality of teaching, methods of assessment, clear goals and standards, acquisition of generic skills, appropriate workload and, finally, overall satisfaction. It has been a matter of considerable concern to the Royal Australian Institute of Architects that, over the four years that the survey has been conducted, architecture graduates are consistently the most dissatisfied with their course experiences of all graduates from all discipline areas. This seems to be saying that all is not well in architectural education and that there may be a fundamental mismatch between the objectives of architecture schools and the objectives and aspirations of architecture students.

The question is — Are we sheep, confined within a sheep pen, looking over the fence, incapable of moving outside the sheep pen? Or worse still, are we following the sheep in front blindly and unthinkingly through the narrow gap in the fence into the next sheep pen?

In a book, published by the Royal Australian Institute of Architects, entitled "What if anything is an architect?," by Professor Tom Heath, there was a series of cartoons drawn by Geoffrey Atherden entitled "Scenes we will never see," which make fun of the extent to which architects have lost their place in the society of today. The first

DESIGN	MANAGEMENT	TECHNOLOGY
A	1	a
B	2	b
C	3	c
D	4	d
E	5	e

SEE APPENDIX

Fig. 2

is the scene on an aircraft and the air steward is asking "Is there an architect on the plane?" The second is in a hijack situation and the guerillas are saying "If we don't get our ransom, we'll start by shooting all the architects." Both of these are scenes we will never see. However, this loss of personal confidence and self-respect by architects is a pessimistic scenario. We should be interested in reading the future in the context of what Peter Ellyard refers to as a "Preferred Future"⁸ or what Mike Mulholland⁹ describes as "Creating the Future." When one is an educator, one has to have an optimistic view, or how can one look students in the eyes? What is the future for the thousands of young people who are studying architecture internationally?

INTERNATIONAL PERSPECTIVE

One useful procedure is to look at some statistics about the place of architects and architecture students in the world. In the developed countries of the world there is a range from 280 architects per million of population up to some very high figures around 1500 architects per million of population in Italy and Japan. There is an even wider range of architecture student numbers in the developed countries from as low as 65 students of architecture per million of population in Canada up to 1600 in Italy. China, India and Indonesia, three countries which together have a population of 2,240 million people, almost ten times the population of the USA, have virtually no architects. There are also many other countries in

Asia, in Africa and in other parts of the world with small numbers of architects and architecture students. These countries will experience huge development over the next fifty years, unlike the developed countries of the "western" world, and there will be huge demand for both architects and architectural education. The latter may be delivered in these countries, or may be provided by existing universities in other countries.

Here is one optimistic scenario for architecture students and for education. There is a possibility to move outside of the "sheep pen" and to "stretch" the opportunities for architects and education through mobility. In this scenario, however, architects must be equipped to solve real problems and to be relevant. One can be reasonably certain that the needs of these societies will not be primarily for "poetics," but for effective living environments that

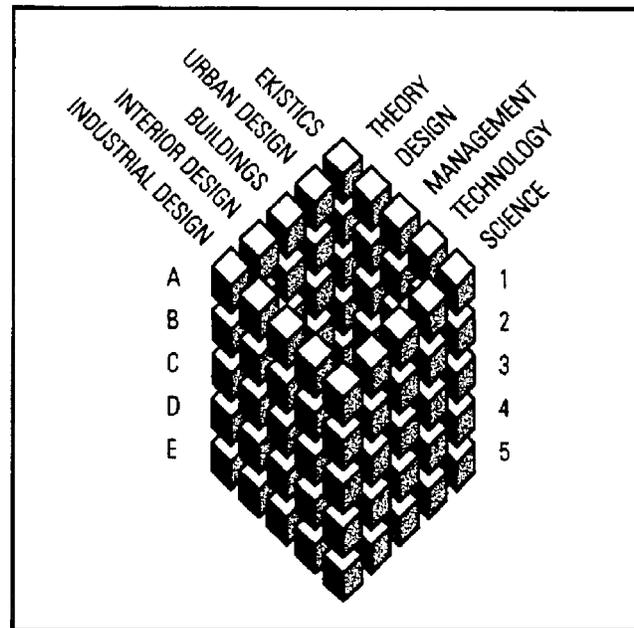


Fig. 3.

confront the problems of people and of the natural local and global environments.

GETTING OUT OF THE SHEEP PEN

Figure 1 represents what might be called the diagram of Conventional Architectural Education as described by the education frameworks in many countries including US, UK and Australia. This diagram could be described as the "sheep pen" of architectural education - and it may be based on a blinkered and conservative view of what it is that architects do. In Australia the current RAlA Education Policy states "The primary purpose of an architectural education is to provide students with technical proficiency and competence in the design and documentation of works for new and existing buildings, and the administration of building contracts."¹⁰ As the diagram shows, the components of this narrow education are also often contained within their own "sheep pens" as four (or five or six) discrete subject areas — design, cultural studies, technical systems, practice and management.

The caption of another cartoon in the book is — "Are architects wise? Not if they are still architects?" One has to look at how the domain of architecture can be stretched. At a conference on architectural education held by the RAlA in Australia in 1991, I promoted the argument that we had to address the question "What, if anything, is an architect?" before we could meaningfully discuss architectural education. Figure 2 is a matrix I drew at that time, I called it a DMT matrix, which described a hierarchy of activities in which architects regularly participated in three areas — Design, Management and Technology — and a five notional levels (see also Appendix 1). This matrix enables a recognition that there is not just one description of an architect, but many across the areas of design, management and technology. Looking across this tabulation one can see, for instance, that a typical architectural practitioner in a small/medium size practice is probably a C/3/c; an architectural critic or writer may be an A/5/e; a project manager on a major building may be an E/2/e. It is possible to describe the characteristics of 'an architect' in most of the many diverse guises we find today. This allows us to focus on the question "What, if anything, is an architect?" Is an E/2/e any less an architect than a C/3/c, or the latter any more an architect than an A/5/e? The problem is today that architectural education focuses on a

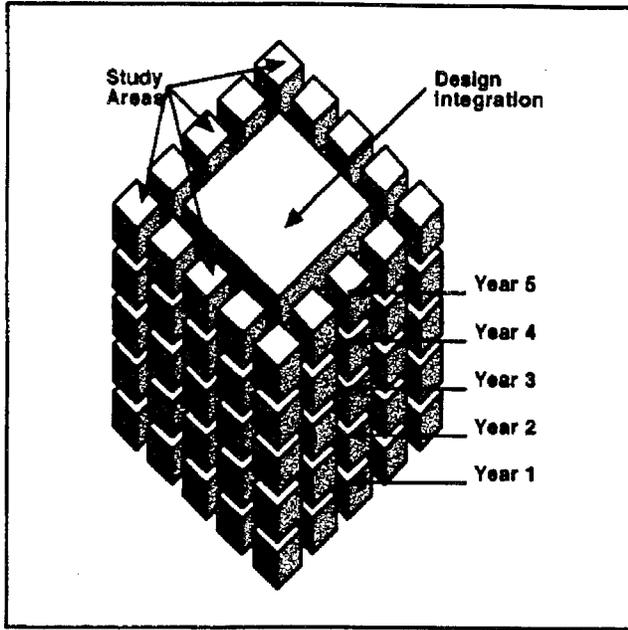


Fig. 4.

very singular view of what an architect is — a design architect, preferably working in her/his own architectural practice, designing buildings with "poetics." Another cartoon in the series shows an architect in a protest demonstration — others are carrying placards relating to liberty, justice, equality, health, heritage and environment, and the architect is carrying a placard relating to aesthetics or styling. Thus is the architect's sphere of influence relegated to the areas of the superficial. Thus is the architect's position in society marginalised. Is architecture relevant?

Figure 3 shows an elaboration of the DMT matrix, a three dimensional matrix which suggests how the domain of architecture can be stretched to reclaim territories that architects used to occupy — on the top left "ekistics," to use the word from Doxiadis, representing human settlements; urban design and landscape architecture; building; interior design and industrial design. I use the word building and not the word architecture, as my proposition is that architectural thinking will permeate all. The optimistic scenario for architects and for architecture students is, as has been suggested by Mike Mulholland, "the leader as architect and the architect as leader" so that the "scene we will never see," illustrated in another cartoon in the series, of two Martians demanding of a statue "Take us to your architect", may not seem so laughable.

How can we get there? If we look at the dictionary word "architectonic" it is defined as "...pertaining to the arrangement of knowledge." Here is a proposition. Architecture is not about arranging lines on paper, or arranging spaces, or light, or materials, or functions — it is about arranging "knowledge," about the ability to think creatively and to invent the future.

It is useful to look at the concept of right brain and left brain thinking which appears to have established some credibility. Left brain thinking is attributed as analytical and convergent — the exercise of reason. Right brain thinking is attributed as conceptual and divergent — the exercise of imagination. There are opposites described — linear and meander; safe and adventure; certain and chance; rules and intuition; particular and general; experiment and experience; western civilization and indigenous cultures; order and chaos; from cause to effect and from effect to cause; from question to answer and from answer to question. It is generally attributed that left brain thinking is the sphere of the engineers, scientists, accountants and economists and that left brain creative thinking is the

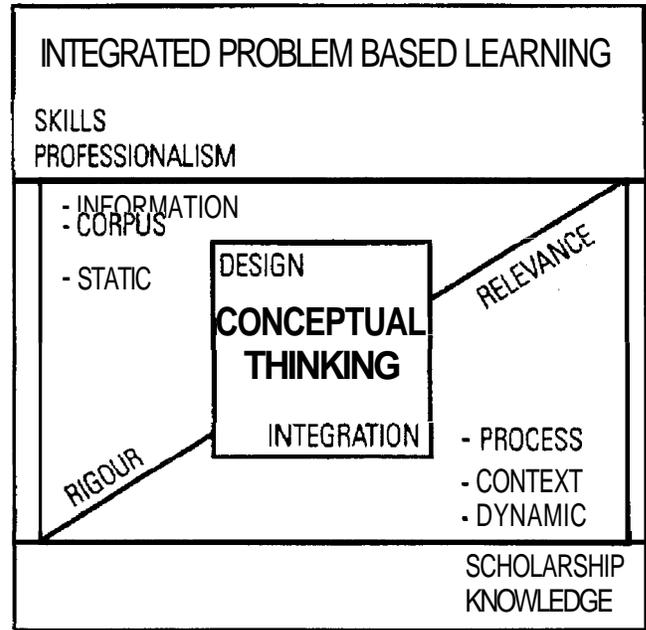


Fig. 5

sphere of artists, writers, musicians, designers and architects. The accuracy of this representation can, of course, be questioned as there have been many creative engineers and scientists. One must also question if architects at this time are in fact capable of right brain activity? In addressing their future, and the educational programs that will lead them there, are architects enclosed within a "sheep pen" of left brain constraints? Can they think outside the sheep pen of what has gone before?

STRUCTURES AND METHODOLOGIES IN ARCHITECTURAL EDUCATION

A very common structure of architectural education in many architecture schools throughout the world" places the "design studio" as a separate activity from the many study areas — such as structures, construction, environmental studies, cultural studies, professional practice, law, economics — unrelated to the work being undertaken in the design studio.

The design studio is the jewel in the crown of architectural education. Its glittering size commands the hearts and minds (and time) of students, while the so-called "support" courses often get short shrift the primary thrust in most studios is form-making unfettered by such mundane considerations as: Will it stand up? What's it made of? How will you heat it? Is it affordable?¹²

Other structures may see the elements of an architectural education delivered in an albeit comprehensive modularized framework of unrelated boxes. Or the elective studio model, often vertically integrated between students in different grades or years, may allow the students to chose what they will do and successfully avoid what they do not want to do, perhaps resulting in great gaps in their overall education.

The structure and methodology adopted by, the University of Newcastle, Australia, was introduced in 1984 and was based on the principles of "Problem Based Learning" derived from the Medical School at McMaster University in Canada." Since then we have refined this course program and there have been many publications on the course in books, journals of education and at conferences throughout the world.¹⁴ Some credibility is given to the success of

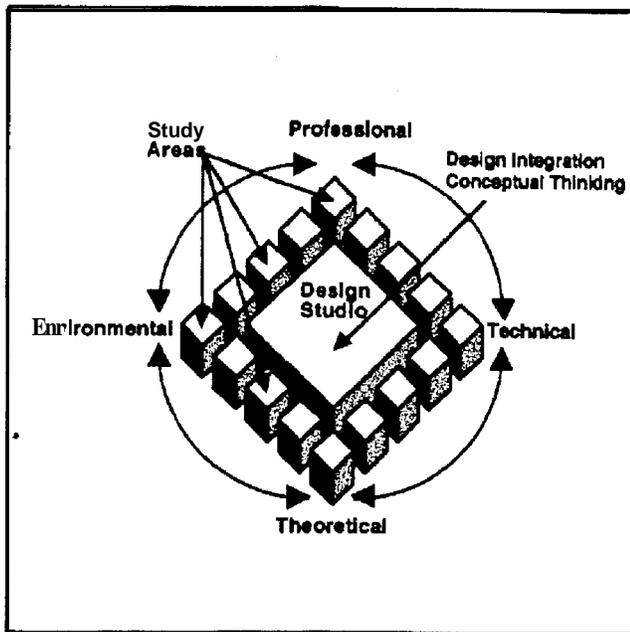


Fig. 6

this program in the Course Experience Questionnaire survey of graduates, referred to earlier, conducted by the Graduate Careers Council of Australia, which has shown over the four years that it has operated so far, a high level of graduate satisfaction with the University of Newcastle course, rating it among the most satisfactory of the 15 recognized architecture schools in Australia.¹⁵ Graduates from Newcastle have also been recipient of many architecture student awards, and are much sought after by the leading architectural practices in Australia — not as drafters or technicians, but as thinkers.

The framework of the course structure we have adopted is shown in Figure 4. It places the design studio as the center of all activity and the process of "Design Integration" becomes the central vehicle for the learning of all the "Study Areas." The course is driven by a series of specially "designed" problems known as "Phases," which are conceived in interrelationship to each other as a progression from Year 1 to Year 4 of the course, and are constructed to include within them clear learning objectives. Year 5 is an elective Final Project. The intention with this course structure is to empower the process of "conceptual thinking" to connect information and process, and make the bridge between scholarship (see Fig 5). Figure 6 represents the central position of Design Integration and Conceptual Thinking in the Design Studio thus integrating four domains of study areas — theoretical, technical, environmental and professional — around the design problems. It is clearly understood that education is not about treating students like empty bottles to be filled with information, and is not about starting in Year 1 at A and proceeding in Year 5 to Z. The "credo" of Integrated Problem Based Learning (IPBL) is — "I hear and I forget, I see and I remember, I do it and I understand." Our course program sets out to create a situation where the students "DO IT."

INTEGRATED PROBLEM BASED LEARNING

This we now call "Integrated Problem Based Learning." Figure 7 is a matrix with, horizontally, the "Phase Problems", run by the Year Manager and Studio Tutors, which cut across the various "Study Areas" offered by Consultants. Each Phase Problem is constructed to include learning objectives from some or all of the study areas in a carefully designed way. The program is facilitated by the fact that at Newcastle there is a large design studio building

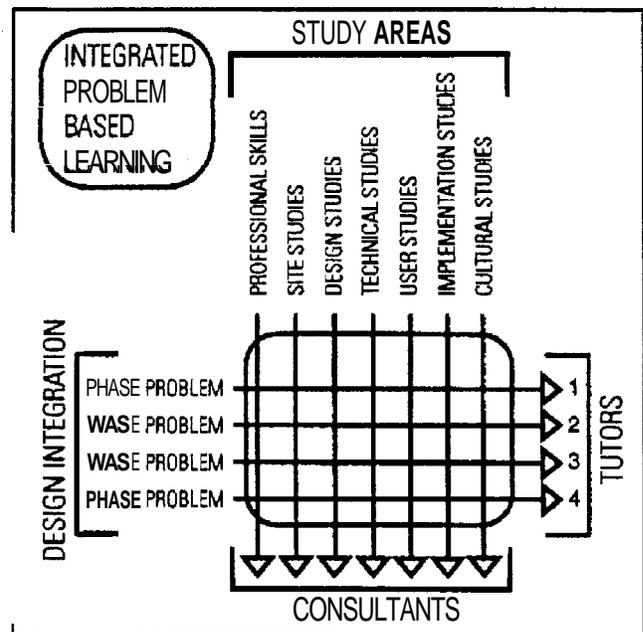


Fig. 7

which can offer a working space for every student. Students are encouraged to work in the university at all times, and the studio is open 24 hours a day, 7 days a week. The intent is to use the studio and the integration of the learning program to overcome student isolation and to use the synergy of the studio to create student centered learning. This is good for the students as a basis for the establishment of life long learning skills, but it is also good for the staff in an environment of reduced funding and staff cuts and shifts the responsibility for learning onto the students. In all of this the tutorial group is very important. The studio tutor acts as a facilitator and the group activity is structured by the introduction of the "trigger" or cue, problem formulation by the group, the generation of hypothesis, the definition of an inquiry strategy and subsequent critical evaluation. Students on most "Phases" work individually and not in groups, and make individual submissions, but the tutorial group activity is central to the learning process. Individual critiques of student work, on a one-on-one basis, are absolutely discouraged, as group critiques by the tutor and the group are a much more fruitful learning experience. The traditional didactic "chalk and talk" lecture has been much reduced although not totally eliminated and there have been many shifts away from it and towards studio based group learning.

The "Phase Problems" are therefore designed to raise issues and questions that need answers to be developed. In this way the need for information is heightened in the students and they are then ready to receive and understand. The "Phase Problems" conducted in the studios bring the students into contact with the whole range of study areas in an integrated scenario. Solutions are made through studio tutorials, some lectures, workshops, site visits. A typical example is the learning of "Building Services," a subject often boring to architecture students. There are no regular lectures on building services. The "Phase Problem" at appropriate times includes the necessity for the students to consider and resolve issues of "Building Services." What we do is to then arrange a series of intensive workshops when the students sit down in a large group with a professional Services Engineer Consultant. He will take them through the services requirements and they will, with his assistance, develop their own solutions and will submit with their design proposals, usually a report to explain the services components of their design. They thus learn to understand the interrelationship between the architect and the services engineer, as well as the interrelationship between the building services and the building fabric, facade sys-

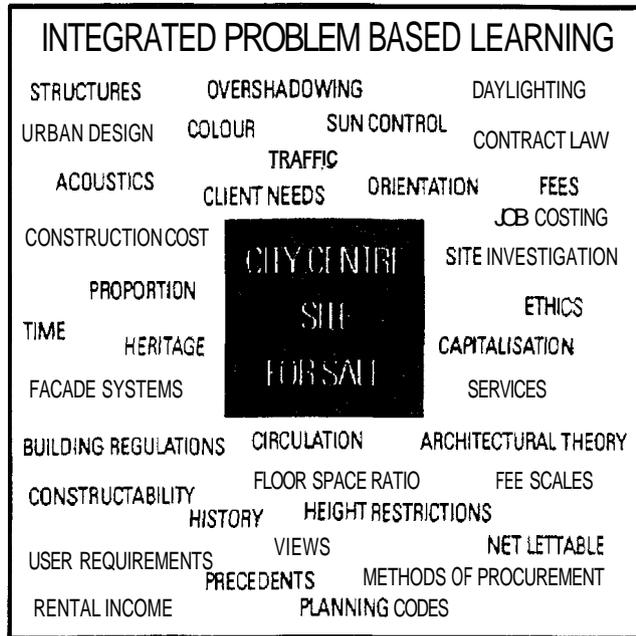


Fig. 8.

tems, structure, cost, sequence of fabrication, etc. This is one detailed example of "Integrated Problem Based Learning."

The following is an example of the approach to the design of the "Phase Problems" and how real life situations are used as a "trigger" for action by the students and the tutorial groups. From first year, right through the course, every "Phase Problem" is a real life scenario. Probably the most sophisticated, from Year 4, is known as "the High Rise Project" and has become infamous in our course. It is undertaken in the first semester of Year 4 over a concentrated 8 week period. The scenario is "Site for Sale, City Center, Sydney - tenders for the site close in 8 weeks, developer walks into an architects office and asks for a design proposal". The students attend a meeting in Sydney with a representative from a major property development company, such as the Japanese company Kumagai Gumi. They are briefed as a developer client would brief an architect. They also meet with a major architect who has personal experience of a project of this scale and may have worked on the subject site. They meet the City Council Planning Department. Conflicting requirements are established that raise natural tensions.

The students are required to prepare a design, make a structural report on the project, make a report on the external envelope system construction, make a report on environmental strategies, work out all aspects of the planing, establish the maximum floor space they can get on the site, cost the project, assess the financial income that can be achieved and how this can be capitalized to an investor, and, finally prepare a bid for the site. Figure 8 is a collage of all the issues that the students have to address in the process of undertaking this studio project. They have access to structural and services engineers, they have to research themselves facade systems — many, many things. As the diagram shows the topics to be considered are many. The benefit, however, as a learning experience, is not precisely the detail of any one topic, but how these all interact. The students in our program also undertake this project working in parallel with some students of Construction Management, who assist them with constructability, cost and procurement aspects of the problem. Students are also well aware of the organizational context within which such a major building is procured. At the end, each student has to prepare a plan for the architect's office for program, staffing and fees to demonstrate a profit for the architects practice.

DESIGN	MANAGEMENT	TECHNOLOGY
A Design Theorist, Journalist, Critic who may not design	1 High level Management, Government Minister, Chief Executive	a Highly Technical Researcher, Scientist not related to projects
B Concept Designer, Competitions, Presentations	2 Senior Management Government, Large Practice, Developer	b Technical Designer, Specialist Designer of Specialist Systems
Project Designer for projects of various size	3 Manager Medium Practice, Building or Development Co	c Technical Designer on Major Projects, Documentation
D Designer of small projects or parts of large projects	4 Group leader in Large organisation, Manager Small Firm	d Technical Designer of Sub-Systems, Drafter
E Virtually no design activity	5 Virtually no Management Activity	e Virtually no Technical Activity

Appendix I

WHAT ABOUT THE POETRY?

This may all seem terribly boring and pragmatic, and to be a far cry from the issues of "poetry" in architecture. Nevertheless our students do consider their "personal theoretical position" and they do speculate on new approaches to address a project of this nature within the current intellectual framework of architecture. They are, like students around the world, influenced by fashion, by technology, by ecology, by intellectual exploration, by whatever is their personal agenda. What we feel, however, is that they make these explorations within a real context, and the speculations that they make are informed by real issues and a real world. They are, therefore, operating in the realms of the relevant. It is not style, or space, or light or aesthetics. It is how to solve a real problem and to provide commodity. If poetry and delight is the result — so be it.¹⁶

"Are architects wise?" This is yet to be determined. Will the profession stay within its present sheep pen and pursue an educational framework which is constrained and compartmentalized leading to a marginalized product focussed profession trading in an out of date commodity? Or can the profession look forward with "Vision 2020", open the gate of the sheep pen and graze in an optimistic pasture trading in creative thinking and integrated problem solving that will have relevance and currency worldwide — an optimistic scenario for the 21st Century."

NOTES

- 1 E.L. Boyer and L.D. Mitgang, *Building Community — A New Future for Architecture Education and Practice* (Princeton: The Carnegie Foundation for the Advancement of Teaching, 1995).
- 2 *1998 Conditions and Procedures* (Washington: National Architectural Accrediting Board, 1998).
- 3 *Criteria and Procedures for the Validation of Courses, Programmes and Examinations in Architecture* (London: Royal Institute of British Architects, March 1997).
- 4 *UIA/UNESCO Charter of Architectural Education* (Paris: International Union of Architects, April 1996).
- 5 L.N. Johnston and T. Parolin, *Submission on behalf of the Royal Australian Institute of Architects to The Review of Higher Education Financing and Policy (West Committee)* (Canberra: RAI, June 1997).
- 6 J. Ainley and M. Long, *Course Experience Questionnaire* (Melbourne: Graduate Careers Council of Australia, 1993, 1994, 1995 and 1996).
- 7 T. Heath, *What, if Anything, is an Architect?* (Melbourne: Architecture Media Australia, 1991).

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- ⁸ P. Ellyard, "A Preferred Future," Paper presented at the UIA World Congress, (Chicago, 1993).
- ⁹ Mike Mulholland, "Architecture — an Identity Crisis." Paper presented at IAA Conference InterArch '97 *Architectural Education for the 21st Century* (Sofia: IAA, 1997).
- ¹⁰ *Architecture Course Recognition Procedures* (Canberra: Royal Australian Institute of Architects and Australian Architects Registration Boards, 1993).
- ¹¹ L.N. Johnston, "Structure and Methodology in Architectural Education," in Luscombe, D. and King, S. (Eds.), *Aspects of Quality in Architectural Education* (Sydney: Royal Australian Institute of Architects, 1995). pp. 45-56.
- ¹² M. Crosbie, "Why Can't Johnny Size a Beam," *Progressive Architect* (June 1995): 92-5.
- ¹³ B.S. Maitland, "Problem Based Learning for an Architecture Degree", in Boud, D. and Feletti, G. (Eds.), *The Challenge of Problem Based Learning* (London: Kogan Page, 1991), pp. 203-210.
- ¹⁴ S.E. Chen, R.M. Cowdroy, A.J. Kingsland, and M.J. Ostwald, (Eds.), *Reflections on Problem Based Learning* (Sydney: Australian Problem Based Learning Network, 1993).
- ¹⁵ Video. *The Education of an Architect — A New Approach* (Newcastle, NSW: Faculty of Architecture, University of Newcastle, 1993). (9 mins).
- ¹⁶ L.N. Johnston, "Expedition of Discovery: Architectural Education at Newcastle", in Ballantyne, R., Bain, J. and Packer, J. (Eds.), *Reflecting on University Teaching: Academics Stories* (Canberra: Australian Government Publishing Service, 1997), pp. 437-444.