

Positing a holistic approach to sustainability

Dr Ursula M de Jong

School of Architecture and Building, Deakin University, Geelong, Australia

Abstract: This paper uses my home institution, the School of Architecture and Building at Deakin University, Geelong, Victoria, Australia, as a case study of sustainability in context. Reflectively and critically it looks at three areas: the Waterfront Campus which houses the School of Architecture and Building; the underpinning pedagogy of the current curriculum in the School of Architecture and Building; and the challenges of implementing an integrated holistic transdisciplinary approach to ESD (variously defined as ecologically sustainable design or environmentally sustainable development) in the School of Architecture and Building. This paper examines: Where is it taught? What is taught? What guides the teaching? How are they related? and What would be a better way of teaching?

The School of Architecture and Building is located in a restored, recycled and redeveloped woolstore, originally built during the nineteenth and early twentieth centuries, overlooking Corio Bay. As a living example of adaptive reuse it invites consideration of the ongoing cultural, social and civic values of heritage, and demonstrates aspects of sustainability, and unsustainability, in practice to students who use it every day. An exploration of the underpinning pedagogy and *raison d'être* of the current curriculum in the School of Architecture and Building reveals an additive rather than an integrated approach to sustainability. The architecture profession's approach to ESD will be examined through the RAI's policies and their impact on practice. The nexus between practice and teaching is revealed through the accreditation process. Traditionally aspects of ESD have been taught as separate units of study within the curriculum. This paper argues for a significant transformation in our thinking, in order to affect a change in our teaching/learning approach, such that current social, environmental and economic issues are addressed holistically. In a climate where we are doing "too little, too late" it signals a profound shift in the way we must address the issue of sustainability.

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INTRODUCTION

There can be few more pressing and critical goals for the future of humankind than to ensure steady improvement in the quality of life for this and future generations, in a way that respects our common heritage – the planet we live on ... Education for sustainable development is a life-wide and lifelong endeavour which challenges individuals, institutions and societies to view tomorrow as a day that belongs to all of us, or it will not belong to anyone. (Australian Government, Draft IIS for DESD:7)

This paper uses my home institution, the School of Architecture and Building (a+b) at Deakin University, Geelong, Victoria, Australia, as a case study of sustainability in context, and argues for a more holistic approach to sustainability. In essence the paper understands sustainability to be about meeting the needs of today, without adversely impacting on the needs of tomorrow. As a term it can be applied across a range of areas, such as the environment, society and the economy. If you look up 'sustainable architecture' in Wikipedia, a source frequently accessed by students, it tells you the notion is encompassed by the broader term sustainability, then separates out various components of environmental technology such as energy, air pollution, waste management, etc. (Sustainability, Wikipedia, the free encyclopedia, accessed 25 August 2007). This Wikipedia definition of 'sustainable architecture' represents the *status quo* and is the antithesis of the meaning of sustainability that this paper embraces.

Reflectively and critically then, this paper looks at three areas: the Waterfront Campus which houses the School of Architecture and Building; the underpinning pedagogy of the current curriculum in the School of Architecture and Building; and the challenges of implementing an integrated holistic transdisciplinary approach to ESD (variously defined as ecologically sustainable design or environmentally sustainable development) in the School of Architecture and Building. This paper examines: Where is it taught? What is taught? What guides the teaching? How are they related? and What would be a better way of teaching?

1. a+b AT DEAKIN'S WATERFRONT CAMPUS

The School of Architecture and Building is located in a restored, recycled and redeveloped woolstore, originally built during the nineteenth and early twentieth centuries, overlooking Corio Bay. As a living example of adaptive reuse it invites consideration of the ongoing cultural, social and civic values of heritage, and demonstrates aspects of sustainability in practice to students who use it every day.

How does a warehouse get transformed into a university campus? The waterfront woolstores in Geelong symbolised the significance of the nineteenth century wool industry, which surpassed even the wealth of the 1850s Victorian gold

rushes. The grandest of the brick and timber structures that dominated the waterfront was the Dalgety Woolstores, built by Frederick Gonnermann Dalgety in 1891.

As wool production expanded and demand increased the Dalgety Woolstores site expanded to seven connected buildings including the prominent Dennys Lascelles building. Each building is a testament to a different era. The 1890s relied on construction with all imported timbers. The 1930s heralded the era of steel columns and beams. In the wartime 1940s, builders reverted to timber but this time it was iron bark and hardwood from Victorian forests that were used in place of the scarce metals and imported woods. The final major addition was completed in 1954, in the era of concrete columns, beams and floors. (Deakin Inauguration booklet: 1996)

But the wool industry was changing, and by the second half of the twentieth century traditional woolstores were no longer appropriate for the mechanised handling and selling of wool. While the wool industry remains a multi-million dollar export industry for Australia, most of Geelong's woolstores fell into disrepair by the 1980s. The Dalgety Woolstores was the last of the nineteenth century Victorian woolstores still involved in regular wool sales. In the decline, it became a forgotten building in a neglected part of the city of Geelong. If another use could not be found the woolstores would be demolished (Geelong Advertiser:1992; Stevens:1996)

In the 1990s an initiative to transform the historic structure came from local, state and federal governments in partnership with Deakin University (Rule: 1992; Geelong Advertiser: 1992). In 1993 the local firm of architects McGlashan Everist won a national design competition to transform the derelict woolstores into a new university campus. In articulating their vision McGlashan Everist argued that this was 'more than an opportunity for the creative recycling of a woolstore, it would be the catalyst for the rejuvenation of Corio Bay's foreshore' (Deakin Inauguration booklet:1996). Thus McGlashan Everist addressed three aspects in their design: the relationship between existing fabric and the new; the typology of a collegiate campus; and urban connections. Indeed the competition jury considered McGlashan Everist's 'sensitive treatment of a heritage site is enhanced by skilful and imaginative transformation into a university campus and into a significant linking of Corio Bay with the Geelong CBD' (Architect1994:5).

From the competition jury's report we learn that McGlashan Everist's competition entry was 'unanimously admired for its quiet, tactful and sensitive handling of the scale, structure and materials of the existing buildings' (Architect 1994:6). The proposal, according to the competition jury, 'was characterised by an intelligent and logical arrangement of the academic units of the new campus and a coherent zoning of the project stages. The use of a variety of internal courtyards, cloisters, arcades and open and covered spaces was seen as conducive to an agreeable collegial quality of life, and was further enhanced by the imaginative creation of new spaces' linking to bay and city. 'The design handled light and sun penetration well, in particular opening up facades and creating pleasant and sunny courtyards and maximising access to the northern aspect of the site. It demonstrated a thorough approach to building services integration to enhance amenity and conserve energy' (Architect 1994:6). The competition jury also considered that 'generally the urban design and planning aspects of the proposal were well handled' (Architect 1994:6).

1.1 Adaptive reuse – seizing an opportunity

To allay concerns that the adaptation of the complex would reduce the historical value of the buildings the conservation architect Alan Willingham was engaged to produce a conservation plan. This plan guided the project throughout its construction phase. Thus interventions are distinguished from the existing fabric: the original woolstores were directly designed to fulfil their storage function with deep floor plates of endless structural frames enclosed by thick masonry walls pierced with openings for light.

A three-storey section of deep internal space was carved out to create a central courtyard to serve as the heart and lungs of the new campus. Similarly, the feeling of light and space in the atria, walkways and several smaller courts were formed by the removal of parts of the old structure ('The making of a university campus', *Geelong Advertiser*, feature: 2 April 1996)

transforming the once dark interior. Max Gurrie writes that

Courts are roofed or open to the sky, studios are single or double floor height with structure supported with a new generation of barrap trusses and other imaginative engineering solutions. Some bale lifts and chutes are retained ... (Gurrie 1996:6)

Architects McGlashan Everist reveal that

One of the great joys is that the demolished timbers of red gum, jarrah, iron bark, and brush box are being given a second life as stair treads, handrails, fittings and furniture (Deakin Inauguration booklet 1996). ... [Yet] integrated with this heritage of the past new non-maintenance materials such as glass, galvanised steel, zincalume panels, and the dramatic communications tower emphasise the university's commitment to the next century... (Gurrie 1996:6).

In July 1997 McGlashan Everist's Woolstore Campus for Deakin University won the RAlA President's Award for Recycled Buildings (AA 1997), the state's top conservation award, for its 'creative approach to adaptive reuse of a heritage building of regional and local significance' (Geelong Business News, 1997:11). The Burra Charter is the philosophical base for the assessment of the RAlA Conservation Awards. It states:

Conservation means all the processes of looking after a place so as to retain its cultural significance. It includes maintenance, preservation, restoration, reconstruction, adaptation and compatible use involving no changes to significant structure, changes substantially reversible, changes requiring minimal impact.

Recreation and conjectural reconstruction are outside the scope of the Burra Charter. The RAlA jury recognised McGlashan Everist's Woolstores Campus contribution to conservation. In summing up they stated that

The project demonstrates the cost effectiveness of conserving and reusing a building with considerable budget savings for such a facility. The project represents a creative and modernist architectural approach to adaptive reuse of existing buildings, while at the same time accommodating an ideological shift, from an icon of Geelong's former wealth to an academic institution symbolising the future economic and cultural wealth of Geelong (*Architect* 1997:16-17).

McGlashan Everist's directors, Max Gurrie, Geoff Saunders and John Lee, didn't see the project in the technical sense of conservation of minute fabric or details.

We weren't trying to replace things that were lost. It was really conservation of the spirit of the place, its presence on the foreshore, and its integrity of structure (Gurrie, *Geelong Business News* 1997:13)

Wherever you look, the old and the new sit engagingly, and at times provocatively, side-by-side. The information tower strikes a chord for the technological age, just as the sky-reaching chimney stacks resonated with an era long past. Modern materials such as steel and glass close in on areas of rough hewn timber and brick. But overall there seems minimal interference to the feel of a historically significant structure. The architects initial design has been realised 'heart and soul' says Geoff Saunders (*Geelong Business News* 1997:13). John Lee writes that

Simple and bold construction provided a strong starting point for conversion. The challenge was to achieve a university character including some large scale interior space, clear patterns of circulation and congregation, and natural light and ventilation through the layered and continuous storage areas. Balanced against this transformation was the conservation requirement to retain and conserve as much of the existing building as practical. This transition was achieved by retaining the existing building exterior and by dismantling some internal construction to create courts and atria, which open and connect the space, and provide natural light'. Lee confirms that 'much of the supporting structure was of beautifully air dried ironbark which, where possible, was retained or recycled into stair treads, hand rails and large structural elements.

Some interventions were necessary.

The whole structure was upgraded to meet earthquake requirements, largely achieved by connecting the timber floors to brace and support the masonry walls. Fire protection was satisfied by installing sprinklers throughout.

Lee recognises the contribution of the builders, Wycombe Constructions, who he says

contributed significantly to the building of the Great Hall, by understanding that the necessary construction was substantially in place, and the required work was selective de-construction. They built from the top down, first modifying the roof to provide the required sound control, then proceeding to the acoustic ceiling and walls and so on down through the four levels of the woolstore. ... This design concept achieved excellent economy combined with fully functional space, and the campus is a great showcase for quality timbers, well used. ... (Lee 1997:10).

1.2 What do students see/learn from adaptive reuse?

The National Trust of Australia (Victoria) policy, the adaptive reuse of culturally significant places, states that

Adaptive reuse provides an opportunity to achieve viable new uses or places of cultural significance, thus ensuring their future care and maintenance.

The School of a+b was the first major occupant of Deakin's new waterfront campus, moving into the top floor premises in 1996. In a building steeped in designs and building techniques that span more than a century it was particularly fitting that architecture and building students should be the first to appreciate this environment and surrounds. From the start, the school was supported by an extensive Library. Everyone who visits the building is impressed. The abundance of glass resulting from the sawtooth roof provides a light open feel to the public and private spaces. A gallery overlooking Corio Bay enables a surprisingly intimate link with changing weather patterns, and the wide open spaces that are typical of Australia. Some of the romance of the woolstores has been retained. In a modern development inspired by its origins and acknowledging its history, links with the past have been combined with the functions of the present. Spaces are treated quite differently: the one large space above the library was sub-divided into gallery, reception, administration suite, staff offices, meeting rooms and small teaching areas; in the a+b studio, known as the barn, the more adventurous option of retaining one large open space was taken, here the building structure directly determines what learning environment or space is created. Throughout the woolstores there is a conscious contrast between clean, crisp technological details and the timbers, brickwork and scars of a century of industrial use. It is possible to appreciate building materials and understand different construction techniques through use, through a lived experience. Philosophically Rasmussen concurs with these observations arguing that "Understanding architecture ... is not the same as being able to determine the style of a building by certain external features. It is not enough to see architecture; you must experience it ..." (Rasmussen 1982: 33, 208). Clearly neither the teaching of adaptive reuse nor the broader concept of sustainability needs to take place in a recycled woolstore. But the experiential opportunity offered by this woolstore cannot be ignored: it has the capacity to both enhance and challenge students' thinking, learning and practice in regard to these critical issues. The opportunity for close study is exemplified by a second year technology project unit based on the woolstores and recorded on a website virtual tour through the building complex (http://www.ab.deakin.edu.au/online/woolstores_casestudy/default.html).

1.3 Assessment of the performance of the building

The National Trust of Australia (Victoria) policy, the adaptive reuse of culturally significant places, also states that the reuse of places

has the potential to achieve ecologically sustainable development through the recognition and retention of embodied energy conservation and recycling practices.

The architects McGlashan Everist clearly recognised the economic benefits and cost savings of recycling. Other aspects of sustainability are only considered obliquely. While 'all building services were designed to conserve energy and provide cost effective long term operation' (*The Geelong Advertiser* 1997) sustainability was not the underlying philosophical underpinning of the design or adaptive reuse of the woolstores. Given the nature of the atrium spaces, it was initially thought that the building would require minimal air conditioning and heating. There are however a number of major issues with the reuse of this building: black window frames and blinds on the west side of

the building are elegant but hot! Windows are barely openable, outside offices only being able to access fresh air. Internal offices have no fresh air. Temperature control/climate control is difficult with heat gain and loss from roof glazing. Cross ventilation could have been facilitated, by allowing the fuller opening of windows and the provision of a number of openable panels on the sawtooth skylights. This strategy was deemed to be a security issue and not implemented. The retrofitting of a heating/ cooling system after summer temperatures reached the high 30s on the top floor was costly and the new exposed ductwork detracts from the original design work. Lighting is another major issue: the whole building is lit up all day, with no individual controls in place. This negates the energy efficiency of operations in the building complex. In a city which has been under level 4 water restrictions for years there is no system in the woolstores complex for collecting rainwater and recycling it within the building, for example for the flushing of toilets. Anecdotally the open plan offices are noisy and privacy issues abound. More formally, systematic post occupancy studies are being undertaken by staff and their final year thesis students and postgraduate students. Two research projects undertaken recently are a 'Daylighting analysis of the Barn Space' and a 'Report on the performance of the a+b Studio Solar Air Heater'. Through the daylight analysis, it has been discovered that no direct sunlight penetrates into the barn space on either 21 June or 21 December at 9am or 12noon because of the orientation of the glazing. It was suggested that clerestory skylights combined with existing fenestration augmented by electric lighting would be the most advantageous combination for this large studio space. The second report states that solar air heating offers the potential to reduce greenhouse gas emissions. Normally it is designed to contribute up to 50% of heat to the space, complementing conventional fossil fuelled space heaters. After twelve months of monitoring the contribution of the two 60m² solar air heaters serving the large a+b studio, it has been found that their contribution is in fact less than 5% due to poor controls and poor design.

The sheer size of these buildings and the variety of spaces accommodated in the building envelope create a multitude of challenges for researchers not found in newer constructions. It is fortuitous that in the School of a+b there are skilled people who can actually study and monitor them on a day-to-day basis, with little impost or extra cost, enabling students to experience first hand relevant projects, where research continues in order to improve the buildings for people and their environment. Thus these recycled refurbished woolstores provide a real laboratory for building performance investigations.

2. a+b CURRICULUM

An exploration of the underpinning pedagogy and *raison d'être* of the current curriculum in the School of Architecture and Building reveals an additive rather than an integrated approach to sustainability. The architecture profession's approach to ESD will be examined through the RAIAs policies and their impact on practice. The nexus between practice and teaching is revealed through the accreditation process.

Architecture is a professional discipline that embodies all creative fields concerning the design of our physical environment, whether residential, cultural, commercial or industrial. The graduates of the School of a+b 'help to create outstanding, productive and sustainable places for living and working.' Our School promotes a number of core degrees in construction management and architecture: Bachelor of Construction Management (BCM), Bachelor of Facilities Management (BFM), Bachelor of Design (Architecture) (BDA), and Master of Architecture (MArch.). The BCM course description mentions '... implementing sustainable solutions', while the aims and objectives include '...environmental awareness and social responsibility'. It is worth noting that the AIQS Australian Cost Management Manual Volume 4, Elevation of Sustainable Development, 'provides tools designed to assist the Quantity Surveying profession in the communication of their skills whilst contributing in the Sustainable Development process'. Among other things, the manual comes with a software tool for evaluating buildings, providing an index to indicate their "sustainability". The wide ranging units in the BCM however, on building economics, professional practice, construction and structures, building materials sciences, technical projects and building research projects provide only glancing references to sustainability. Building Environmental Studies 1 at second year considers ESD, while Building Environmental Sciences at third year explores 'alternative approaches with lower environmental impact'. At fourth year a Building Technology *elective* unit focuses on ESD via innovative technologies, biomimicry and sustainable architecture. The unit Built Environment Integrated Project is a new school wide capture unit undertaken by all undergraduate students in their final year. While students are referred to P Brandon and P Lombardi's (2005) *Evaluating Sustainable Development in the Built Environment* (Blackwell Publishers), the only lecture on sustainability is delivered in the final week of the unit, when the students have already completed their integrated project! Nonetheless the BCM and BCM (Hons) degrees rightly claim to deliver 'a well-rounded graduate able to deal with new challenges, process innovation and project complexity'. This paper suggests they could do more. A comprehensive approach to education for sustainable development is needed. Together the BCM and the BFM train our key professionals in the building industry. They are in a prime position therefore to educate future graduates to have a clear understanding of sustainability as the fundamental platform of the building industry, integrating professional and environmental ethics, environmental awareness and social responsibility into a holistic framework, at a time when theoretical frameworks and practical models for a more sustainable world are becoming clearer.

In the course description and academic rationale for the BDA it is envisaged that students will be able to 'implement sustainable solutions'. The degree offers 'major streams in building technologies, architectural design, architectural history and theory, sustainable environmental studies and communication'. Under aims and objectives of the BDA students will acquire '... knowledge of building technology services and sustainable practices ... the ability to envision imaginative and sustainable futures and leadership skills necessary to realise them'. Knowledge and understanding of principles and applications of sustainable development are gained through Building Environmental Studies 1 and 2 and Building Environmental Sciences and are integrated into design projects. Awareness of professional ethics, social responsibility and cultural diversity are developed in history and theory, design,

environmental sustainability and technical units. The focus in design projects at first year is on composition and making meaningful and appropriate dwellings; in second year responding to human needs in various climate zones; and architecture and tectonics; in third year there is an emphasis on ESD goals. In construction and structures energy efficiency is dealt with in housing at first year level; in highrise at third year level. In Building Materials Science first year students are referred to P Graham (2003) *Building Ecology First Principles for a Sustainable Built Environment*; at third year Building Environmental Studies 2 examines heat, light and sound in the context of sustainable design, construction and operation. The new MArch is to 'have a global sustainability focus'. The distinguishing features of the MArch program are an architecture design masterclass and a major sequence in designing urban environments. Sustainable Futures is offered as an elective examining smart technologies for sustainable architecture. Deakin University's School of Architecture and Building leads the field in research into sustainable built environments as is demonstrated by its attraction of large research grants over recent years and the success of MABEL (Mobile Architecture & Built Environment Laboratory) and BERG (Built Environment Research Group). When one looks at the curriculum as a whole however and scans current units for ESD components, it is evident that we are only tinkering around the edges of ecologically sustainable design and environmentally sustainable development. Sustainability remains an add on, an adjunct, an optional extra. Yet the built environment contributes enormously to the degradation of the environment. In a world where there is ever more focus, acknowledgement and understanding of the plight of our planet earth (eg *Crude Impact*), why is this so?

2.1 The RAIA and sustainability

The a+b courses are accredited by their respective professional bodies in building, construction, quantity surveying and architecture. It is the Royal Australian Institute of Architects (RAIA) that guides teaching in architecture by accrediting the architecture courses (BDA and MArch), and it is this body that is the focus of the discussion in this part of the paper.

In 1993 The RAIA adopted the International Union of Architects 'Declaration of Interdependence for a Sustainable Future'. In so doing the RAIA recognised that:

- A sustainable society restores, preserves and enhances nature and culture for the benefit of all life, present and future; a diverse and healthy environment is intrinsically valuable and essential to a healthy society; today's society is seriously degrading the environment and is not sustainable.
- We are ecologically interdependent with the whole natural environment; we are socially, culturally and economically interdependent with all of humanity; sustainability in the context of this interdependence, requires partnership, equity, and balance among all parties.
- Buildings and the built environment play a major role in the human impact on the natural environment and on the quality of life; sustainable design integrates consideration of resource and energy efficiency, healthy buildings and materials, ecologically and socially sensitive land-use, and an aesthetic sensitivity that inspires, affirms and ennobles; sustainable design can significantly reduce adverse human impacts on the natural environment while simultaneously improving quality of life and economic well being. (RAIA Environment Policy 2001:1)

In 2000 the RAIA proposed an Australian Built Environment Policy for adoption by the Council of Australian Governments (COAG) (19 July 2000). In relation to sustainable development it stated:

As it is no longer an effective policy to continue to determine the quality of the built environment solely by regulations which set minimum construction standards, the objective of sustainable development will be encouraged by promoting architecture and infrastructure which:

- minimises pollution of the soil, air and water and sustains natural eco-systems
- minimises the consumption of non-renewable resources
- maximises the health, safety and comfort of the community

The RAIA affirmed the responsibility of the architectural profession, as a key player in the construction industry to embrace an integrated approach to ecological, social and economic sustainability. They saw this being done through individual practice and by bringing to bear their collective expertise and influence in the community. In order to achieve this, the RAIA set down five guiding principles:

1. commit (place sustainability at the core of practice and professional responsibilities)
2. develop (research and develop policies, regulations, practices, curricula, services, standards, contracts and other mechanisms to facilitate implementation of sustainability)
3. educate (educate architects and fellow professionals, the building industry, clients, building users, students, government, manufacturers and the general public about the critical importance and substantial opportunities of sustainability)
4. formalise (encourage policies, regulations and practices in government and the private sector of the construction industry to ensure sustainability becomes, and remains, normal practice)
5. implement (implement and continually improve, subject to professional responsibilities to clients, sustainability in the resourcing, construction, use and reuse of buildings and the built environment) (RAIA Environment Policy 2001:1)

The RAIA Environment Policy was followed up with supplementary documents (RAIA 2001:1) affirming that it has as an objective the implementation of sustainable design practices. In order for architects to meet the objectives they are advised to consider four inter-related tenets of environmental sustainability: bio-diversity, resources, pollution and quality of life. The RAIA recommends specific strategies and actions to make appropriate sustainable design solutions, while recognising that these 'do not form a comprehensive list', often being 'merely a prompt for the most commonly encountered issues. They do not offer solutions, sometimes just raising issues to be considered'. The

architect should always be mindful of the current state of knowledge and technology and be open to change. For the RAI A 'sustainability' refers to 'environmental sustainability'; and 'ESD means Ecologically Sustainable Development'.

The impact of such strategies in practice becomes clear when one looks at a new popular publication called *Sanctuary*, subtitled 'sustainable living with style', published by the Alternative Technology Association (ATA). The editorial in Issue 1 states that 'sustainable houses are starting to make a big impact' and that we 'no longer have to compromise on comfort or style'. *Sanctuary* features '15 of Australia's leading practitioners of sustainable house design' and has tips to 'create your own sustainable haven'. In Issue 2, the editorial focuses on making 'homes more water and energy efficient'. The second issue features

a range of beautiful homes from across Australia that showcase the best sustainable design. Using good passive solar design techniques appropriate to their climate, these houses are not only stylish but are cheaper to run, healthier and more comfortable to live in.

Each house considered, has a summary listing key features at the end of the article. Included are things like recycling (materials), rainwater capture, water efficient appliances and fixtures, zoning, solar hot water and photovoltaic power cells, glazing, garden design as relevant. A house is seen to be made more sustainable by simply adding certain components. While all these elements are admirable, sustainability per se is not discussed, nor is it made clear why any of the projects are in fact 'sustainable'. There is no direct or indirect reference to emissions, to footprint, to life cycle analysis. Drawings have no scale and the size of dwellings and occupancy rates are not critically considered. It is not just what we consume but how much we consume that is critical to the question of sustainability. (You can calculate your 'ecological footprint', a broad brush measure, at www.myfootprint.org/. For all humans on earth to enjoy a typical Australian lifestyle we would need at least another two earth's worth of resources!) (Mellersh-Lucas, de Jong, Fuller:2006).

The RAI A Education policy spells out the role of the education policy in the context of the development of architecture in a rapidly changing world, where 'architecture involves everything that influences the way the built environment is planned, designed, made, used and maintained' and architects 'have a major role in shaping Australia's future'. Consideration of sustainability and ESD however is only *inferred* under the section 'Knowledge: environmental studies', which encompasses

- (i) an ability to inform action through knowledge of natural systems and built environments
- (ii) an understanding of issues of ecological sustainability and design for reduction of energy and environmental impact
- (iii) an understanding of the history and practice of urban design and issues of city planning
- (iv) an understanding of passive systems for thermal comfort, lighting and acoustics and their relationship to active systems
- (v) an awareness of the cultural and spiritual dimension of place
- (vi) an awareness of issues of national and regional planning and their relationship to global and local demography and resources
- (vii) an awareness of landscape design and management of natural systems(RAI A Education Policy 2005:8)

It is clear that the RAI A has no fully integrated policy on ESD. References must be sought and are found across various policy documents and frameworks. Sustainability is not an underpinning philosophy of the architecture profession even though the RAI A would have it be seen as *core* within any architectural practice. Instead, sustainability is seen as one subject in the larger curriculum, rather than the driving force behind the curriculum. Sustainability is often confused with the narrower field of environmental studies, which are seen as one aspect of study within a broader curriculum. While the RAI A states that sustainability always refers to environmental sustainability and ESD means ecologically sustainable development, these terms are not clearly defined; they are open to individual interpretation; and there is no mandatory compliance with a code of conduct, instead there are strategies, prompts and exercises for awareness raising. The School of a+b BDA and MArch degrees clearly meet all the requirements of the RAI A education policy. The School of a+b has been highly commended for its courses and standards by the RAI A, and was fully accredited in 2006 for another 5 years.

In Australia the aim of the UN Decade of Education for Sustainable Development (2005 - 2014) has been interpreted as 'fostering broad awareness and understanding of ESD' (Calder 2005:7). Environmental unawareness means we are inactive. Pollution control means we are reactive. Process integration and holistic facility planning means we are becoming interactive. Not until we are developing industrial ecology and pursuing sustainable regional and global development are we beginning to be proactive. Raising awareness is one step up from the lowest level of engagement with the issues of sustainability, with ESD. And while recycling, rainwater capture, water efficient appliances and fixtures, zoning, solar hot water and photovoltaic power cells, glazing and garden design are to be commended, they do not encompass a change in behaviour or attitude or design strategy. Thomas Berry argues convincingly that

Sustainable development I consider a contradiction. What we need is sustainable life ... In the 20th century the glory of the human has become the desolation of the earth. The desolation of the earth is becoming the destiny of the human. All human institutions, activities and programmes must be judged primarily by the extent to which they inhibit, ignore, or foster a mutually enhancing human-earth relationship. That's my summary of the 20th century. The 21st century is going to be a terrible century to control because the consequences of the 20th century are flowing over to the 21st century. So we have the re-building of the planet Earth, the re-ordering of the planet, the re-ordering of human relations, the re-thinking of our food, clothing, energy systems, the re-thinking of populations. All or these things are going to have to be re-done. All the professions ... are going to go in to a completely new period ... We need to establish the conditions which are going to need to be observed if we are going to enter into a new creative period' (Berry *HOPE Art Design Ecology*).

We need to urgently and fundamentally rethink what we as design/building professionals define as ecologically/ environmentally sustainable development/ design.

3. TOWARDS AN INTEGRATED HOLISTIC APPROACH

The recycled woolstore which houses the School of a+b demonstrates the up-sides and down-sides of adaptive reuse in practice. From the perspectives of heritage and architectural design McGlashan Everist have created a finely integrated project, such that the woolstores retain much of their rich heritage 'without compromising the function, technology or comfort of a modern university' (Gurrie 1996:5). The potential of adaptive reuse to contribute fully to sustainability however has not been addressed. a+b staff and students do get leverage out of being in a recycled heritage building because it provides many opportunities for experiential learning and meaningful discussions about adaptive reuse and ESD. Traditionally however, and as furthered by RAIA policies and demonstrated by the current a+b curriculum, aspects of ESD have been and continue to be taught as separate units of study within the curriculum (for example measuring building performance, or calculating embodied energy or building orientation). This paper argues for a significant transformation in our thinking, in order to affect a change in our teaching/learning approach, such that current social, environmental and economic issues are addressed holistically. In a climate where we are doing "too little, too late" it signals a profound shift in the way we must address the issue of sustainability. It supports the 'debatable perspectives' taken by UNESCO's International Implementation Scheme (IIS) that 'ESD should not be equated with environmental education, but rather encompass it and go beyond it' and that 'ESD cannot be taught as an independent subject, but should be infused throughout the curriculum and the disciplines' (Calder:2005:5). Thomas Berry argues that

We must be wary of the current cultural traditions. Although they carry many rich elements, they have not enabled us to avoid destroying the planet. In other words, it is not functionally an adequate guide. So we need to establish a cultural guide for the human that can guide us into the future and this amounts to a new revelatory experience ... we must respond with critical reflection ... (Berry *HOPE Art Design Ecology*)

The Australian Government's 2007 document *Caring for Our Future, the Australian Government Strategy for the United Nations Decade of Education for Sustainable Development, 2005-2014*, builds on its 2000 *Environmental Education for a Sustainable Future* report. It concludes that ultimately the success of the strategy

rests on the ability and willingness of people across all walks of life to make informed decisions at work and in their homes and to take responsibility for their impact on the quality of life of other people, locally and globally (p. 9).

In the end this document is disappointing, rich in rhetoric, poor in providing leadership in committing Australia to ecologically sustainable development, poor in committing to action for change.

Peter Graham (2005:10) argues that unsustainable development is not a design problem but an attitude problem. Educators need support to change the *mind* an architect designs with! (Refer also to Su Mellersh-Lucas). Indeed Graham suggests that we begin by identifying and eliminating *unsustainability* from our own lives. 'The conversation about how to implement this while prospering and being happy then becomes a process of sustainable development' (Graham 2005:10). While some argue that Graham's approach represents an extreme position, this paper sees it rather as at one end of a 'sustainability' continuum, with an integrated holistic lifestyle at one end (Graham's position) and selective choices or 'add ons' at the other (such as the houses featured in *Sanctuary* cited earlier). Ken Wiltshire sees the solution to ESD as learning how to think in terms of 'forever'.

At policy level integrating ESD into national, state and local economic, environment and social policies ... In education practice, embrace an ethic of sustainability; make ESD a pervasive part of teaching; use a wide range of learner-centred teaching strategies appropriate to developing the 'heart' (values) and the 'hands' (action) of life as well as the 'head' (cognitive learning) (Wiltshire 2005:preface)

ESD is fundamentally about values, with respect at the centre: respect for others, including those of present and future generations, for difference and diversity, for the environment, for the resources of the planet we inhabit (Australian National Commission ... National Symposium 2005:3).

Sustainable development as defined by the Brundtland Report (1987), while it has its critics, is still pertinent development that meets the needs of the present without compromising the ability of future generations to meet their own needs,

globally addressing the triple bottom line of environmental, social and economic considerations.

Achieving sustainable development will require not only appropriate skills and resources but a fundamental alteration to the way development and change are conceptualised (A situational analysis of education for sustainable development in the Asia-Pacific region: 6)

McDonough and Braungardt posit not only a holistic way of thinking about 'sustainability', as articulated in their waste=food model and championed in their book *Cradle to Cradle*, but also profess their vision in practice (SBS Documentary waste=food 2007).

In regards to education for ESD Caroline Haddad states that it is 'imperative that stakeholders understand the unique holistic and cross-cutting nature of ESD' (Haddad 2005:5). She argues that 'ESD should not be viewed as 'one more subject' to be added to an overcrowded curriculum (Haddad 2005:8). Instead, education for ESD should be treated as 'a holistic or 'whole school approach' where sustainable development is seen as a context for delivering existing aims of education and not as a competing priority' (Haddad 2005:8). Education for ESD should therefore be interdisciplinary and holistic. It should be values-driven, based on sharing the values and principles underpinning sustainable development; and determined by critical thinking and problem solving, leading to confidence in addressing the dilemmas and challenges of sustainable development (Australian National Commission ... National Symposium 2005).

While the current education system represents a major barrier to pursuing an interdisciplinary and holistic approach to ESD, the Decade of Education for Sustainable Development (DESD) offers an opportunity to support educators to

attain the competence and the will to include sustainability learning as a central theme in their curriculum. It affords the School of a+b the prospect to conduct a more formal snapshot of what is happening to identify gaps/opportunities to re-orient the entire program towards ESD. It creates the opportunity to appropriately embed ESD in the degree structures, to make sustainability a core component of all programs; to facilitate complex understandings; to work towards the School of a+b becoming a model of sustainable lifestyle; to evaluate the outputs (tools), outcomes (knowledge, values and skills) and impacts (clear behavioural changes and improvements in sustainability) of ESD; and with the RAlA to celebrate practices that achieve ESD.

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This course, promoting a holistic approach, is aimed to reach all individuals interested in the topic and willing to promote a sustainable participatory planning of Energy Transition. The course focuses on the socio-territorial and environmental perspective in order to understand Energy Transition as a social construction process. The first two modules of the course are dedicated to clarify the concept of ET and to understand it as a social construction process in order to territorial, social and environmental perspective. In the third and fourth modules we will address the issue of the Sustain... The IKEA approach to sustainability. How we manage sustainability in our business. 3. Customers. For a product and its packaging to be classified as more sustainable, it must score a certain number of points in the IKEA Sustainability Product Score Card. It is a prerequisite that the product is produced by suppliers that meet the social and environmental requirements in the IKEA supplier code of conduct IWAY. IKEA Sustainability Product Score Card criteria. in brief In sum, "the term 'sustainability' should be viewed as humanity's target goal of human-ecosystem equilibrium (homeostasis), while 'sustainable development' refers to the holistic approach and temporal processes that lead us to the endpoint of sustainability." [20] Despite the increased popularity of the use of the term "sustainability," the possibility that human societies will achieve environmental sustainability has. But sustainability is also a call to action, a task in progress or "journey" and therefore a political process, so some definitions set out common goals and values. [41] The Earth Charter [42] speaks of "a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace".