Integrating the conceptual and practice worlds: 
A case study from Architecture

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Abstract: A compelling challenge for tertiary educators is to respond meaningfully to pressures to provide curricula that translate readily into real-world professional experience. To explore the synergies of an integration of the conceptual and practice worlds, this paper draws on a program, which the author evaluated, that was part of a Committee for University Teaching and Staff Development funded project for students of architecture and construction. The aspect discussed here, Composing Architecture—The Music Room, involved 74 second year students at Deakin University in semester 2, 2001. The case study is used as an illustration of curriculum design, including assessment, to explore how it met the aims of creating learning experiences that were purposeful, rich in their complexity, and mirrored the demands of the profession in a supportive environment that fostered development. One of the major aims was to model professional practice within the academy—in a sense, to enter into a dialogue between the academy and the profession—with the quality of that dialogue being determined by the accuracy or authenticity of the modelling. With this focus, having articulated and discussed the stated educational challenge that this project was intended to meet, the paper tests this against the attributes of authenticity in the environment of education as delineated by Martin-Kniep (2000) and, in so doing, questions some of her claims. Although some theorists (eg, Petraglia, 1998) contend that to prescribe what counts for authenticity is impossible, it is hoped that some insights into linking the academy and the profession will be gained.

The Project: Composing Architecture—the Music Room

Music, in its many forms, is something that is integral to most of our lives, something that we experience and enjoy every day; much like our architecture. You are asked to undertake the transition from listener to the role of composer or instrument maker in order to address one of two propositions that relate music to architecture. Firstly, that practitioners of music and architecture share similarities in compositional and design processes. Secondly, that musical instrumentation and architectonics are both products of 'making', reliant on intuitive and sensory interplay in order to produce a finely 'tuned' artefact. It is contended that architects have much to learn about architecture from the study of music… 'Composing Architecture' studies the association of music and architecture in experiential
terms through the design of a small-scale architectural masterpiece, the Music Room. The project then requires you to achieve thorough resolution at a detailed level of your conceptual design; a means of allowing your design concept to transcend from the idea to the realisable [through 1:10 models and detail drawings] to be furthered through the construction of 1:1 models of selected schemes…(Ham, 2001, SRD264 website)

This multi-faceted project over a period of nine weeks required students first to create a piece of music or an acoustic musical instrument. Their musical compositions or instruments were then related to the composition of architectural space through the individual design of a Music Room, a space “specifically designed for the contemplation and/or composition of music”. This was followed by the construction of a 1:10 model with detail drawings. Students in groups of 10-13 then selected one of these designs and constructed it as a full-size piece and, finally, in their groups, presented their finished Music Room with associated posters and websites to their assessors and peers.

**The educational challenge**

The need to provide curricula that demonstrably prepare students for their professional lives is a significant challenge for today’s tertiary educators. In this context, theoretical and applied knowledge are never regarded as mutually exclusive. Rather, their linking, with its anticipated consequential synergies, is seen as an essential component of the learning experience.

In this specific instance, the educational challenge was seen as threefold:
1) To provide meaningful and purposeful links with other disciplines
2) To bring together the worlds of design and construction
3) To move from the individual to the collaborative.

This challenge was met by a learning task rich in possibilities and requirements and in this way mirrored the complex interplay of issues that inform architecture and building.

**1) To provide meaningful and purposeful links with other disciplines**

Areas of high creativity, such as design, suggest private, often idiosyncratic, spaces and there is an aura of the esoteric. The individual is foregrounded as freedom to express oneself through the composition is an embedded expectation. Yet, in a discipline, such as Architecture, where the design normally requires making by others and has been commissioned by, and for, others, preparation for the profession entails that, while students have space and support to develop their creativity, they also gain experience of how the ideation underpinning their design is realised in its structure.

The first area of concern for the lecturer and unit chair, whose work is considered here, was to enhance the creative design element. His view is that, as architectural practitioners are composers of form, space, and materiality, students within this discipline have much to learn from the study of composers and their compositions in relation to philosophy and technique. Concerned by an increasing move towards specialisation within Architectural education, he argued that this trend towards the insularisation of architectural education almost inevitably leads to the output of designers less acquainted to ‘looking outside the realm’ for inspiration. Hence a deliberate association with non-architectural disciplines formed an integral element of the project.
The art chosen for the cross-fertilisation of ideas was music because of the lecturer’s practical and research interests (as architect and percussionist) and its strong associations with architecture amongst scholars over the years (MacGilvray, 1992). Wanting students to consider the design and construction of the Music Room from multiple perspectives, the lecturer commenced with the purpose of the room. Alternative understandings of what constituted music were discussed and links to compositional websites provided opportunities for self-exploration. Translational associations with music, through free-form sketching whilst listening to musical pieces, allowed a guided entry into the generally unknown world of musical composition. In these ways students were encouraged to recognise that creativity is often underpinned and stimulated by the work of others and that professionals customarily seek, and have the skill of knowing where to seek, inspiration.

2) To bring together the worlds of design and construction
The salient question to address was how to impart upon early students of architecture the importance of ‘designing construction’ and ‘design making’. Although final year students had undertaken design/construct projects during the course of their studies, there was a shared concern within the School that they tended to slip back into the mould of ‘architect as concept designer’ when given a major project, yet to realise that design is about construction with designs scrutinised most intensely at the detailed eye-level. In terms of connectivity with professional reality, the fact that the majority of projects within the undergraduate design curriculum operate entirely within the ‘schematic design’ stage, yet this constitutes only 15% of the fee basis of full architectural services (RAIA, 1996), becomes a serious issue.

The lecturer concerned contended that the importance of a tectonic approach to design (ie one incorporating the science or art of construction) is best realised when a design concept is actually constructed and an interaction between user and artefact occurs. This occurs infrequently at university. The problem is compounded by a tendency to oversimplify with flat and unidimensional problem situations or by setting unrealistic and unrealisable tasks (for example, the design of a school within the space of four weeks). Such approaches lead students to believe that the architect designs in isolation and only to a conceptual level, leads every design/decision-making process and is not a team-player. They do not prepare graduates for the reality of the architecture where design teams are composed of architects, consultants and project managers with satisfactory resolution requiring high detail as well as construction viability. Issues such as responsiveness to the client and the influence of resource constraints, as well as the critical requirement for the designer to ‘sell’ the design and the builder the finished product, are frequently disregarded elements of conventional projects set as student learning tasks. As Brown et al (1989) pointed out, there is the danger that “By participating in such ersatz activities students are likely to misconceive entirely what practitioners actually do”. A fuller contextualisation, such as the Composing Architecture project, combats such reductionist tendencies and allows students to realise that complex, multidimensional problems demarcate the territory of real-world professional activity.

3) To move from the individual to the collaborative
The first submission allowed students to operate entirely conceptually, knowing that the projects would be developed further. A second individual submission required students to explore the tectonics of their conceptual design, culminating in the construction of a 1:10 model with detail drawings. To link concept and construction (the designer and the builder) the next stage saw the transition from sole practitioner to collaborative team player and from design architect to construction manager and constructor. Six teams of 10-13 people (organised by the lecturer in alpha sequence) were required to select a colleague’s project to undergo the transition from concept to construction. This 1:1 construction task was obviously
beyond the capacity of any single student and hence the requirement to work as part of a team was purposeful. Moreover, working collaboratively meant that the learning was embedded in social practice. For theorists such as Golomb (1995), “… attaining authenticity is by no means a solitary pursuit. Indeed, what seems incontrovertible is that authenticity cannot be achieved outside a social context”.

While Petraglia (1998) contends that “valuing collaborative learning for itself is only beginning across the academy”, if we accept that knowledge is socially constructed this entails that authentic learning requires dialogue with others. Further, if tertiary study is seen as preparation for a professional life, as Bruffee (1993) asserts, collaboration is important because it mirrors the dynamics of doing business in the real world. The ability to work as part of a team is perceived as so important to most fields of work that, as Taylor (1993) claims, “Team building has become a vital management skill and a prerequisite for good management”.

Were these authentic learning experiences?

In the information provided for this conference we are advised that “an authentic learning environment can be described as one where activities represent the types of complex tasks performed by professionals in the field, rather than decontextualised or contrived activities”. Such a statement indicates that a representation may be justifiably termed ‘authentic’. While some theorists would argue that authentic activity requires “that learning and knowing always be located in the actual situation of their creation and use” and repudiate simulations (eg, Wilson, 1993), I am more in accord with theorists such as Petraglia (1998) who suggest that the fundamental task facing educators is “to create the sorts of curricular environments that permit authentic learning to take place”. I concur with Golomb (1995) that “the philosophical understanding of ‘authenticity’ is far more complex than its everyday use suggests”, with the notion of authenticity signifying something beyond the domain of objective language. However, in an attempt to understand more fully the concept of authentic learning environments, it is generative for the purposes of this discussion to delineate the essential characteristics of an authentic learning environment and, through a consideration of the Composing Architecture project, test both the project and also the claimed attributes. Although there are several such lists extant, Martin-Kniep’s was chosen because it is relatively recent (2000) and is a publication of the American Association for Supervision and Curriculum Design Development.

1) Real purpose and audience

Martin-Kniep (2000) contends that authenticity “requires that students engage with real-life problems, issues, or tasks for an audience who cares about or has a stake in what students learn”. This ‘invested’ audience sits beyond the classroom. While, as discussed and demonstrated above, the Composing Architecture project had real purposes, a critical test of any task we would choose to label ‘authentic’, there was no involvement with a client who had specific needs for the Music Room to be built and in this way the ‘authentic’ nature of the task was lessened. In the final presentations the audience (which included invited members from the industry, other parts of the university and three core assessors who were all qualified architects with practice experience) certainly cared about what the students had learnt but they did not have the sort of stake that a client would have. While this audience sat ‘beyond the classroom’, more significant, given the intended learning outcomes of this project, was the role of peers. In the early formative stages of this project with student review of work, the students, as audience, assumed the role of the client. In all of the final presentations the connectivity of the roles of designer and constructors/project managers was explored.
Evidence of meaningful learning endorsed the comment of one presenter that the group had learnt “how designers need to specify very precisely and be prepared to link with the construction process”. Designers also gained insights from how their concept had been realised with some being quite ‘stunned’ by the scale of the finished products. While some designers were surprised by, and uncertain about, some modifications, others recognised and appreciated the value-adding of the changes the construction group had made. They were interested parties and represented the different perspectives from which these students’ work will be judged in the professional arena, while providing students with some experience of how it feels to have one’s creative output developed by others.

2) Integration of content and skills
The project clearly met the requirement to build on prior knowledge and apply knowledge and skills from related areas. The nationally funded project mentioned above had led to the development of a series of unit webpages, resource pages, Virtual Galleries, digital projects and ‘games’. This constituted a new mode of delivery of projects within the school and reinforced a major direction of Deakin University. By the start of second semester, the lecturer believed that the students had achieved a high degree of mastery of digital technologies relative to that of previous years. The Composing Architecture project was seen as the natural extension of this continued exploration, and the work produced in the brief timeframe evidenced that students successfully transferred skills.

3) Disciplined inquiry/academic rigour
Tertiary teaching would seem to mandate a desire to provide learning opportunities that lead students to seek deep understanding. Martin-Kniep (2000) links this with “systematic research and inquiry using a variety of primary and secondary sources”. In this project the sources were richly varied and, while the built piece was the culmination of the project, the crux of the learning was the explicit linking of the conceptual and the applied. However, to restrict ‘academic rigour’ to effective use of a variety of sources, as Martin-Kniep has done, seems reductionist. Here academic rigour was demonstrated by the skills that were required as students engaged in cognitive and physical activities that integrated and applied their theoretical learning in multi-faceted and elaborate tasks.

4) Explicit standards and scoring criteria
Martin-Kniep (2000) claims that, for assessment to be authentic, students need to participate in the identification of performance standards for the task and in the rubrics that distinguish levels of performance with the criteria on which judgements will be made provided. Negotiated assessment, along the lines Martin-Kniep is referring to, was not part of this project and nor, it is contended, was this necessary for this project to be justifiably termed ‘authentic’. In the professional world, judgements are often arbitrarily imposed. What is essential in this context is that these judgements are based on known reasonable criteria. In this regard the website provided students with a clear listing of the issues to be explored and these were linked to explicit criteria that, themselves, stimulated and challenged. The self-assessment criteria encouraged students to articulate how they had expanded their understanding and developed their design processes and the mastery (ie externally assessed) assessment criteria, while listing such elements as the relationship to the brief, and the craft and quality of the presentation, put as pre-eminent “the qualities of the finished artefact, to be judged on Vitruvian qualities of ‘firmness, commodity and delight’” (Ham, 2001, SRD264 website).

5) Elaborate communication
This was a strength of this project’s design, and Martin-Kniep’s explanation that this means that “students communicate what they know and can do and how they think through written,
artistic, and oral performances and exhibitions, and through opportunities to teach others” was met fully. While the project included each of these elements, how the students dealt with these communicative opportunities was highly revealing. There was an undeniably high level of communication for nearly all projects as far as the presentation of the final ‘masterpieces’ with their supporting posters and the websites were concerned. However, the oral presentations exposed that the students were, on the whole, far less accomplished in this area. Naïve honesty and openness in comment and the exposure of problematic elements within the experience indicated that these students still had much to learn. Sophisticated self-promotion is an important part of the repertoire of the successful architect yet is rarely explicitly taught. This is an area that the project aimed to address and this experience indicated that students generally are yet to recognise its importance and require further skill development and support.

6) Levels of thinking
Martin-Kniep (2000) explains this as follows: “Students use basic and higher levels of thinking in a task that calls for a combination of skills and forms of knowledge”. The project description at the start of this paper provides compelling evidence that this is highly complex task. While students were able to contribute to the teams that constructed the music rooms in many different ways, and the contribution and commitment at this stage were demonstrably variable, all students were engaged in a series of learning opportunities that incorporated the need for cognitive flexibility across the taxonomy. One less satisfying element, however, for some students came as a result of the brief (3 weeks) time frame for construction as successful project management meant, as some realised, that students contributed in areas of identified strengths, so reinforcing skills rather than exposing them to areas where they felt they had a lot to learn. With this caveat, because the learning design motivates students to explore a variety of sources, to reflect on these, to discuss and seek solutions to real and immediate problems, and to apply developing understandings in meaningful ways, it supports a deep approach to learning.

7) Reflection, self- and peer-assessment and feedback
Martin-Kniep (2000) claims that in an authentic learning environment students “reflect on both products and processes through ongoing and specific questions, checklists, or rubrics”. Coupled with this is formal evaluation of their own and other’s learning “through ongoing, elaborate, and specific feedback from both their teacher and peers”, leading to refinement and enhancement. The explicit self-assessment and mastery criteria prompted reflection. In the first stage, a roving bazaar review allowed students to peer review colleagues’ design work, along with associated musical compositions. Students could draw on this critique as the initial concept could be refined in response. During the construction period the lecturer arranged for solid support to be provided with frequent formal and informal contact so that students could receive feedback on their progress and receive assistance.

The assessment of the Music Room, itself, was tied to a presentation by each of the groups to a panel of reviewers and this gave students the opportunity to engage in a conversation with their assessors and their peers. Here the feedback was immediate and, while the assessors deliberately posed evocative questions, the students engaged readily in the studio critique. Discussion with the evaluator reinforced that groups who chose to ignore advice from mentors and peers had some experience of its consequences and of the need to take responsibility for their decisions and actions. A further element was the incorporation of a group assessment form which gave students the opportunity to assess individual contributions to the team effort. This sought a numerical rating for judgements regarding contribution, time
spent, attendance, innovation, enthusiasm, resourcefulness, motivation and team spirit and represented 20% of the final mark. The professional world requires constructive appraisal and, while it is not surprising that such peer assessment caused difficulties for some, it was an important learning experience.

8) **Flexibility in content, strategies, products and time**
While the students had choices in terms of their original design and later their construction, the flexibility was more qualified than Martin-Kniep (2000) would consider necessary. Not only were student choices constrained in terms of subject area (the Music Room) but the brief total time span of five weeks for all meant the time allocation did not allow flexibility for different students and their needs, nor was there an explicit concern to accommodate differences among the products or performances, the two areas Martin-Kniep stipulates. However, the flexibility Martin-Kniep considers as an essential attribute of authenticity can reasonably be seen as denying the fundamental desire to represent, to the greatest extent possible, real-world conditions. As professionals, there are almost inevitably external constraints such as subject, time and work group and it is a critical aspect of the role of an architect that the completed work satisfies complex criteria ranging from the aesthetic to the highly pragmatic in terms of conforming to building regulations and tight schedules with financial penalties for failure. Within the envelope of the Music Room and the guidelines provided, there was, as would be expected in the professional context, marked diversity in outcomes. Hence the qualified flexibility was a more reasonable representation of the professional world, and the learning environment was more authentic, than if the types of accommodations stipulated by Martin-Kniep had been incorporated.

**Conclusion**

Although theorists such as Petraglia (1998) argue that “Teacherly common sense tells us that life is multi-faceted and complex and that any attempt to prescribe what counts as real and authentic is doomed to failure”, this complex series of tasks demonstrably meets accepted characterisations of an authentic learning experience. At the same time, as this discussion has attempted to reveal, it challenges some of the claimed attributes but it also suggests that there are fundamental shared understandings of what is entailed in the provision of ‘authentic learning environments’. This case study suggests that perhaps the most compelling requirement for those concerned with educating our undergraduate students as preparation for professional life is to be prepared to draw on one’s own knowledge of the professional world to give students the opportunity to achieve excellence and to apply their conceptual knowledge and creativity. From his choice of the word ‘masterpiece’, this lecturer consistently sent the message that the professional world of Architecture is demanding but, in a supportive environment, students could gain the experience to use resources to produce truly impressive outcomes (see Fig 1).

![Figure 1: Examples of the built Music Rooms](image-url)
From the outset, students were challenged and what they produced throughout these intensive five weeks offers abundant evidence that all seventy-four were engaged in a rich learning experience. Underpinned by individual exploration and creativity, the rigour involved in the translation of architectural ideas to reality through the team construction of the Music Rooms quickly became apparent. Previous notions that architectural design occurred only to conceptual stages were, by necessity, overturned. Design and making were brought together as one with a curriculum that was readily translatable into real-world professional experience. This quality modelling of professional practice within the academy—its conversation—can be celebrated as authentic and can inspire and challenge tertiary educators.

References


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Acknowledgements

The author expresses her sincere thanks for the experience of sharing the teaching of this project with the lecturer (Jeremy Ham) and his students and for their willingness to explore its contribution to their understanding.