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Nuclear Architecture: Perceptions of Architectural Technology

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Abstract. In this paper we explore the implications of pluralist curricula for architectural technology. This includes the potential effects on strengthening the identity of the architectural technology profession and the academic development of the discipline. This latter relies, arguably, on research being explicit in CIAT's eight mandatory threshold standards. This work concentrates on one of the Chartered Institute of Architectural Technologist's (CIATS's) key subjects; 'design', defined as detail design for the architectural technologist. In postulating a philosophy of architectural technology epistemology with a focus on detail design, the pedagogy of architectural detailing in practice and academia is investigated: the associated roles of creativity and conditioning are explored. The interrelationship between conceptual design and construction processes in practice is outlined, identifying the role of the detail design specialist (architectural technologist) in the management of design and production information. Thus is identified the future architectural technologists' specialisation of nuclear architecture: the total quality construction created by quality of thinking which permeates from and to detail design for assembly/disassembly and production within a collaboratively mechanised AEC team. A theory of nuclear architecture and an associated approach to detail design pedagogy are postulated, aiming to promote a revised perception of the definition of design for the architectural technologist. How this theory can be applied to the creation of a paradigmatic student project, themed on designing for disassembly as a key future focus of 'Healthy Building' design is introduced for future exploration. This future research into detail design, the authors propose, should be predicated on the appropriate methodology related to the epistemology of a design-based area of the architectural technology discipline. The roles of Professional, Statutory and Regulatory Bodies (PSRB) in the evaluation and subsequent dissemination of this detail design pedagogy, with the aim of strengthening the architectural technology discipline are emphasised.

Keywords: Philosophy of architectural technology epistemology; Pedagogy of architectural detailing; Theory of nuclear architecture; Dissemination of detail design pedagogy; Strengthening the architectural technology discipline

1. Introduction

The 2014 Quality Assurance Agency's (QAA's) subject benchmark statement (SBS) for Architectural Technology (QAA, 2014), devised and reviewed every seven years in collaboration with the Chartered Institute of Architectural Technologists (CIAT), industry and subject specialists, is less prescriptive than previous versions. The aim of this SBS is to provide guidance and not prescription, allowing a variety of interpretations by accredited Higher Education Institutions (HEIs), creating a plurality of architectural technology curricula in the United Kingdom. There is an additional requirement for the curriculum to map to CIAT's eight mandatory threshold standards of achievement, which graduates of Architectural Technology from accredited HEIs must achieve. CIAT, one of the main Professional, Statutory and Regulatory Bodies (PSRB) for architectural technology education, has published guidance (CIAT, 2015) for mapping these threshold standards against the four key subjects of design, technology, management and practice as outlined in the 2014 SBS. It is of note that the key subjects of 'design' and 'technology' are separated in this mapping guidance: in mapping an area of the curriculum which has a focus on detailing, it will not necessarily be mapped to the indicative content related to 'design'. The SBS is limited to threshold and typical or 'modal' levels of performance expected of a graduate in the subject: there can be an avoidance of desirable skills and addressing excellence (Yorke, 2001). Yorke (2001), counsels that the SBS represent general expectations *about* standards and are not statements *of* standards and thus can be too vague, generic and devoid of aspiration.

1.1. THE PLURALIST ARCHITECTURAL TECHNOLOGY CURRICULA

The AT curriculum evolves to reflect current and future needs for practice in the Architecture, Engineering and Construction (AEC) sector. This must be coupled with the need to provide an exciting and challenging academic programme which develops the discipline (Wienand, 2013). The 2014 SBS affords HEIs more autonomous creativity with the curriculum, enabling a pluralist expansion of the architectural technology discipline.

The 2014 SBS statement includes a section 2: 'Defining principles': architectural technology is defined as being' integral to the design of buildings and structures' (QAA, 2014, page 7). It claims that the subject is based on fundamental principles of science and engineering 'applied to achieve optimum functionality' (QAA, 2014, page 7), efficient and durable in construction and sustainable over its life-cycle. All AT degrees should develop students' knowledge and critical appraisal of four key aspects; design, technology, management (newly introduced since the 2007 SBS), and practice in both a national and international context. The CIAT guidance on the mapping of the course content to the benchmarking (CIAT, 2015) includes associating these four key aspects to eight mandatory threshold standards.

The associated checking of the mapping of the AT curricula in HEIs against the current QAA benchmark is done by the CIAT through their accreditation processes. CIAT produce a report on the quality of provision which outlines whether; the provision meets the current threshold standards for the academic content of the curriculum; it is of an acceptable standard for professional requirements; and that it provides exciting and challenging teaching and learning environments. These reports are not published making it difficult for HEIs to gauge the relative standard of their provision and to seek out exemplary academic practice. Crucially, whilst the myriad of interpretations of the benchmark statement allow for creativity in curricular devisal across HEIs, it is not easy to keep track of the expansion of the discipline. The resultant pluralist curricula the authors argue might be to the detriment of a clear and focussed identity for the academic discipline of architectural technology.

1.2. RESEARCH: STRENGTHENING THE IDENTITY OF THE ARCHITECTURAL TECHNOLOGY PROFESSION

Architectural technology (AT) is believed to be, theoretically, a viable vehicle for the integration of research and teaching (Emmitt, 2006). The technologies applicable to the building profession have multiplied in number and complexity in the recent past (Emmitt, 2012). The detail design of buildings requires design knowledge of how they are put together, used and eventually taken apart or re-used (Emmitt, 2002) involving many different professions and participants in the AEC sector; architectural technologists, architects, interior designers, structural engineers, services engineers, environmental consultants, design/BIM/project/construction managers, surveyors, builders, specialist sub-contractors and building component designers/manufacturers. Architectural technology as a discipline has evolved considerably since the early 1990s. The CIAT (previously the British Institute of Architectural Technologists; BIAT) as a professional body, created by its professional, academic and student members, has gained associated strength and identity, both in the academic development of the discipline and the perception of the professional roles of the architectural technologist.

The separation of design from technology in architectural education and practice allowed the specialisation of architectural technology to emerge: architectural technology is the art of building which fuses the three separate realms of artistic, practical and procedural skills (Emmitt, 2002). The remit of the architectural technologist is in the detail and jointing of architectural components; they are the 'constructive link' (SAAT, 1984) between design and production (Emmitt, 2002). Research provides evidence of the future practice of the architectural technologist: it should explore whether there will be no pragmatic design without technology in the face of advances in architectural technology, ICT, building procurement methods, detail design for production and building life-cycle considerations. The authors aim to reinforce the need for AT research to provide evidence of the subsequent strengthening of the discipline through the recombination of design and technology.

1.3 RESEARCH: TEACHING AND LEARNING RELATED TO PRACTICE

In the UK the discipline of architectural technology is located predominantly in 'teaching-led' institutions, which affords their distinctive contribution as offering first class teaching and applying the knowledge gained from research to practical problems (Dearing Report, 1997). Moreover, it is the relationship between research and (student/researcher) learning that is critical (Brew and Boud, 1995). Academics' and students' roles need to be examined as collaborators in the process of learning in carefully-devised teaching situations which aim to disseminate effectively the knowledge necessary for the future development of the discipline (Neumann, 1996). Academics should be offered continuously the opportunities to develop their own practice through participating in the exemplary practice of others (Brew and Boud, 2013).

In relating pedagogy to practice, some aspects of AT practice require conditioning; training building on a priori knowledge and understanding; whilst others require creativity: questioning of the normative behaviours and conventional values.

If a research project is a quest for knowledge, then the constraints and parameters of the search need to be recognised; likened to a 'game' (Wittgenstein, 1968) with rules to be followed as with Thompson's (2013) 'morphological construct'. In the theoretical development of a discipline, research projects that push the boundaries of its conventional epistemology, perhaps involving playing an entirely different 'game' are crucial to the widening of knowledge about that discipline. So, in order to construct the methodology of the research and then to participate in the postulation and creation of new knowledge, cognition of the rationale underlying what is being discovered is necessary. This becomes even more challenging if this is innovative and unrelated to normative practices.

1.4. THE DEFINITION OF DESIGN AS DETAIL DESIGN FOR THE ARCHITECTURAL TECHNOLOGIST

The QAA SBS for AT, 2014 does not advise explicitly on the learning, teaching and assessment (LTA) of detail design in the curriculum (QAA, 2014). However, its importance to the professional body was evinced in December 2014 when the CIAT, during the AT accredited Programme Leaders' Conference, held a session on detail design during which universities that were considered as exemplars of good LTA practice were invited to present to the attendees. Prof. Sam Allwinkle PPBIAT, MCIAT, Chair of the CIAT Education Board, provided a statement on detail design which was relayed to the attendees. He defines architectural technology as the technology of architecture and an essential design function. He states that the architectural technologist must be educated in the anatomy and physiology of buildings. Allwinkle promotes that the professional practice of architectural technologists and the subject discipline of architectural technology are inherent to details and detailing, as these are critical to the successful construction and performance of buildings.

Furthermore, architectural technology being a subject that integrates theoretical, practical and professional activities has a pedagogical focus on the practical application of theory and the development of skills which enhance employability. The simulation of real-life, inter-disciplinary, collaborative scenarios and practical sessions, preferably in a studio/problem-based learning environment is advocated (QAA, 2014).

2. The Epistemology of Detail Design

In investigating and determining the epistemology of architectural technology, this must be related to accepted types of knowledge acquisition and their relevant structures for the area under investigation. Most scientific disciplines have followed the empiricist, positivist approach i.e. that knowledge is out there fixed, waiting to be discovered. The researcher infers knowledge about the real world by observing it, thus obtaining empirical knowledge by induction (the traditional Naturalist epistemology), particularly relevant for aspects of the AT discipline related to technical knowledge and building science. However, other subject areas such as architectural detail design, management, and the acquisition of skills to enhance employability follow a different epistemological model, that of socially-constructed knowledge through experience and enquiry (Brew and Boud, 1995). It is proposed that AT disciplinary knowledge can be divided into two types; discrete, factual knowledge applied to solve a problem or provide an answer, or knowledge gained through the creative process of learning to organise and make sense of ideas into a framework in order to gain a deeper understanding of the problem by actually engaging in problem solving. Detail design, the authors contend, belongs to both types.

2.1. THE ROLES OF CREATIVITY VERSUS CONDITIONING

There are two major learning environments for detail design; the academic and practice contexts. In the latter, it is often expected that the involvement of architectural technologist creates more certainty in the aims and objectives of the construction project (Thompson, 2013). Assumptions are of super-efficient ‘automata’, whom employers want to act like robots rather than thinkers (Thompson, 2013) who do not slow the production process down by taking time to think and question. Technical excellence in the commercial world is often antithetical to individuality and inventiveness. In practice there is no room for misinterpretations of objects in architectural details: these objects are not impressions but materializations which need to be capable of being specified, communicated, procured and constructed within an inter-disciplinary complex whole without ambiguity and/or risk. In architectural practice the more experienced detail designer is adept at making correct judgements; the risk of inexperienced staff making decisions is avoided.

An educational project allows experience and knowledge to be accrued about making correct and accurate decisions in an assimilated work-related context if the educators are experienced practitioners. An emphasis on conditioning and training within architectural technology education perpetuates this whereas, any educational programme which also has a focus on thinking and reflection on practice (Schön, 1983) allows each individual human ‘player’ possibilities for exploration and discovery which are then taken, attitudinally, into future practice. Experimentation in academia and a nurturing of resistance and dissent in the name of progress can enable exploration of creative detailing.

If the acquisition of skills in detail design is akin to the acquisition of effective communication in language, the education of detail design needs to recognise that we do not so much as learn a language as participate in it (Wittgenstein, 1968) and our relationship with language is not one of subject and object as we are active participants and players in the evolutionary changes to language (Snodgrass and Coyne, 1997). Thus, the participants in the activity of detail design will have idiosyncratic and individual interpretations of the re-combination of the constructional elements. There will be correct judgments but also a myriad of correct combinations which, despite idiosyncrasies, are appropriate.

2.2. THE PARADOX: PROFESSIONAL PRACTICE IS DESIGN

A profession such as architectural technology is presumed to build its professional knowledge and evolve as a discipline by instrumental problem-solving through the rigorous and logical application of scientific theory and technique (Schön, 1983). The discipline of architectural technology is identified as having a basis in scientific rationality; this is then applied logically to derive solutions to problems using professional skills and attitudes (Schein, 1973). This Technical Rationality is implicit in normative investigations of the relationship between research and practice and in the resulting curricula of professional education (Schön, 1983).

Schön (1983) contends that in order to frame the problematic and complex situations in practice, a non-technical process of identifying the objectives is necessary and this relies on making sense of 'confusing messes' in the realm of problems of greatest human concern, rather than the identification of clear problems of practice which can be solved applying research-based theory and techniques.

Herbert Simon, (1996) identifies that all professional practice is fundamentally concerned with design and thus to educate for the professions, a student needs to be provided with training grounded in the 'science of design' (perhaps an oxymoron), or more to the point; the science of the design of architectural technology. This entails the extraction of 'well-formed' problems from the messes of practice, which is, the authors recognise, a formal model of sorts (Schön, 1983).

2.3. A COMPARISON OF THE PEDAGOGY OF ARCHITECTURAL DETAILING IN ACADEMIA AND PRACTICE

The normative sequence for AT education is to learn the scientific foundation which underpins the discipline, apply this to real-world, simulated situations and eventually to experience professional practice through live projects or work-based learning. This does not always suit research into practical knowledge where the method for solving practical problems does not always fit into a rational, formulaic approach: technical design solutions in practice are not always a puzzle to be solved but often a problem to be dealt with because, due to their complexity, they necessitate divergent rather than convergent thinking (Schein and Kommers, 1972).

It might seem that the investigation into the AT curriculum and its LTA strategies are within the institutionalised realm of Technical Rationality, making it simple to research based on the natural sciences. In practice, where the myriad of methods of identifying and solving divergent problems with varying degrees of success seems impossibly nonsensical, human behaviour plays a huge part. Furthermore, the AT curriculum is designed and, therefore, to make sense of the myriad of interpretations of its benchmarking requires an acknowledgement of its devisal being often subjective. So whilst research into architectural technology might be based appropriately on the model of Technical Rationality this will not be appropriate where the research methodology needs to account for human behaviour.

Architectural technology education and the particular learning material often relates to fixed, quantifiable, discrete knowledge and is predicated on the learners assimilating factual knowledge. However, architectural technology detailing involves design, especially when the project is non-prescriptive and relies on creativity. A research project should account for the mindset that creates similarities or difference (Thompson, 2013) as opposed to one that adheres to established formulaic analysis and recombination; i.e. approaching a problem using deductive reasoning to obtain a solution. Only if the study of designing relates to the manipulation of discrete, identifiable things as methodological combinations and re-combinations, or as analogous language elements, can it be researched within the domain of natural science. For the purist like Plato (Snodgrass and Coyne, 1997), the correct and logical operation of numbers in mathematics is *the* paradigm for a certain solution to a problem. The Logical

Positivists, of which Wittgenstein was one, sought to formulate a language of science which was devoid of subjectivity. This postulates an 'atomic language model' of understanding.

The authors contend that technical design is not always a pre-determined puzzle to be solved but is often a pre-defined problem with open-ended possibilities: a creative journey which necessitates regular and on-going activity in order to explicate understanding gained along the way. This analysis and development of projected solutions forms the basis of the regular dialogue with tutors. The budding designer in the educational setting is encouraged to questions their prejudices, understandings and narrow-minded conceptions of solutions to allow self-discovery and an edifying experience for both the learner and the educator or 'designer-interpreter' (Snodgrass and Coyne, 1997). This is necessary for the promotion of creative practices often lacking in the practice setting where the architectural technologist is conditioned and encouraged not to embark on a voyage of discovery, partly because of time constraints and the economic benefit of tried and tested solutions and partly because they are often restricted to solving other people's pre-determined architectural problems.

2.4. THE INTERRELATIONSHIP BETWEEN CONCEPTUAL DESIGN AND CONSTRUCTION PROCESSES IN PRACTICE

To investigate the established 'game play' (Thompson, 2013) of architectural technology practice, it needs to be established whether professional activity is sequential, prescriptive, related to the natural sciences, making use of purely deductive reasoning, only related to quantitative data analysis and always based on clear, identifiable objectives or whether it is often a design activity and a voyage of discovery.

If it is the latter, this human activity of designing needs to be studied within the realm of the human behavioural sciences (Snodgrass and Coyne, 1997). If designing is in the context of practice, only an interpretative understanding of the situation can arise rather than an establishment of objective knowledge or truth, because the way by which this understanding emerges, according to Snodgrass and Coyne (1997), is not through the use of method but by the operation of the 'hermeneutical circle'. Snodgrass and Coyne (1997) contend that the atomistic language model, which has often been used to codify the design process as sequential steps in a logical process (derived from Positivist theory), is a fundamental misapprehension of design activity which does not have a basis in formal logic but in the human and hermeneutical sciences based on processes of understanding and interpretation. In researching architectural technology practice and the central activity of detail design, the methodology must be appropriate for this human-based activity. This might be at odds with the perception in AT practice of a sequential design to construction process predicated on the RIBA stages of work (RIBA, 2013) which is often used to devise and structure AT design projects in academia as a simulation of practice.

2.5. THE ROLE OF THE DETAIL DESIGN SPECALIST IN THE MANAGEMENT OF DESIGN AND PRODUCTION INFORMATION

If design can be managed (Emmitt, 1999), arguably, the best people to manage design would be the designers. Architectural design technologists are taught to design within constraints of time and cost; they are educated within a culture where detail design and its management; newly included in the 2014 SBS, (QAA, 2014); are not at odds. Perhaps in the education of the architectural technologist, the inculcation of good 'design' as that which lends itself to efficient management , could provide the industry with those who have a mindset which can resolve the dichotomy of unchecked design creativity and the requirement for definable solutions that can be managed. Emmitt (1999) believes the design manager must be familiar with and able to design. He also states that any building is only as good as its details and that this phase of the design process is poorly researched. The traditional model for the studio project is its sequential phasing based on the RIBA Plan of Work (RIBA, 2014), predicated on every project having four distinct, yet sequential, phases; briefing, design, production information and site supervision. This is now extended to include the life-cycle of the building: detail design for disassembly being a key aspect. More importantly, Emmitt (1999) believes that information management, not design, is crucial to competitive service provision. Research into the role of the detail design specialist in the management of design and production information in the differing realms of academia and practice is crucial to maintaining the competiveness of the professional architectural technologist.

3. The Challenge of Creative Detailing: Assimilation versus Creativity

It is a relatively simple task to create a detail design curriculum content which maps to the AT SBS. Detail design pedagogy is normally focussed on the assimilation of standard or robust details but it is the learning, teaching and assessment of creative detailing which present a challenge for the architectural educator: the normative assimilation of standard detailing inhibits an innovative approach to detail design thinking and reflective decision-making (Emmitt et al, 2004).

If we analogise the assimilation of standard details to understanding a language type structure, logically we cannot understand the whole of a language (complete detail) until we understand the parts (component elements) and their meanings (the building fabric representations) which, paradoxically, need an understanding of the whole (conventional detailing language). If this is analogized to the interpretation of a given detail by the inexperienced student, clues are picked up so that a projected understanding of what is being seen emerges; this is then related back to the whole from which an estimation of a correct formulation is interpreted. We carry on back and forth progressively correcting the parts in relation to the whole and the whole in relation to the parts based on an understanding which advances in this manner until a conclusion is drawn. The final interpretation might be wrong but the means by which the understanding is gained is a critical activity and if this were to be documented, discussed and assessed, a useful habit is initiated. It is this to-and-fro reflection which is the central learning activity. This is the interpretation of details which begins when a student is first presented with an example of a 2D detail. In order to interpret it some kind of basic apprehension is necessary. Sometimes students fail to find the image intelligible and the tutor has to provide a basic explanation of what they are looking at by helping them to make sense of it as we cannot rely on tacit understanding of something which is completely new to us. There is not always a reliance on circumspective perception (Heidegger, 1962).

The students' perception of the visual experience of the detailed assemblage is accompanied by thinking (with the tutor as a catalyst for this action) and when this triggers recognition, 'knowing' occurs (Wittgenstein, 1968). The experience of seeing when there is recognition is different to someone seeing the same object with no familiarity: the tutor needs to differentiate learners' experiences within the same group with the same, given learning objective. To analogise Wittgenstein's rabbit-duck (Wittgenstein, 1968, Fig.1): the student who sees a 'rabbit' when they should see a 'duck' will perpetuate the misperception and, thus, misconception of the represented object. Too often, students do not have a clue what they are seeing especially with 2D graphical representation of building elements. When the drawing contains multiple objects the misconception can be multiplied: here confusion arises and clarity cannot be gained even with an interpreter. Constructing physical, scaled models is perhaps the nearest substitute for the representation of reality, but 1:1 construction has the benefit of no approximation to reality, and the associated spatial 'materialization'. The Building Information Model whilst allowing a 3D visualisation of the architectural design requires an interpretation of the model for the associated detail design information. The model is not constructed at the 'nuclear/atomic' level at present and so can be misread by an inexperienced viewer.

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The copying of standard details becomes futile when the student is required to create imaginatively the architectural design which they are simultaneously attempting to resolve at the nuclear level. The latter relies less on applying a technique than on making sound judgments (Wittgenstein, 1968). The role of the interpreter (tutor, made even more of a challenge if the student is not a native English speaker) in helping the student to critically reflect on 2D and 3D detail design explorations is crucial. The interpreter deciphers how the representation of the construction presented in tutorials; in graphical or model form; is an assemblage of parts designed to solve problems of constructional stability, thermal performance, building regulation compliance, aesthetics, cost, environmental design, water penetration, cold-bridging and, in the focus of this paper, assembly/disassembly. In order for understanding to happen, the student needs to conceptualize that this is a graphic representation and cognize the symbolic representation. If the student sees the actual physical representation of the construction 1:1, or even better participates in a constructional exercise, in model form or on site, they are able to use their other senses of touch and their body to feel the weight of the objects and handle the bulk of the objects. They gain an immediate recognition of that object and an emphatic ‘naming’ of what it is: there is little ambiguity and the perception has changed into materialization (Wittgenstein, 1968). This is why the teaching about detail design uses video, photographs, full-size constructional exercises, and site visits for students to cognize building construction elements.

3.1. APPLYING THE RESEARCH: DESIGNING FROM THE INSIDE OUT

An interesting concept is that an architectural designer who designs a building from the outside in (the usual process for architectural design education) will design a very different building to a designer who designs from the inside out (Simon, 1996). The hypothesis is that the design of buildings for disassembly forces a consideration of and a search for alternative, satisfactory assemblies at a detail design level which requires design thinking and a priori knowledge of detailing. This exploration at a nuclear level; focussing on the ‘nucleus’ or the ‘knot’ (Emmitt et al, 2004); is the remit of the architectural design technologist and their education should re-emphasise the creative design of architectural technology through exciting and challenging educational exercises. Relating to architectural design and detail resolution there is an iterative process between the conceptual architectural design and the conceptual detail design (Emmitt et al, 2004). A creative approach to detail design thinking and decision-making within academia would permeate subsequently throughout the industry. For this to be initiated, it needs to be understood that the interrelationship between conceptual design and construction is recognised, enabled and explored through educational mechanisms (Emmitt et al, 2004). Ideally in practice, the conceptual designer should also create the detailing and this is where the architectural technologist, who also has specialism in design, is ideally placed to ensure the continuity between, and the management of, design information and production information (Barrett, 2011).

In the AEC sector this is not one person's responsibility but a team effort. The design and assembly/disassembly of buildings has become increasingly complex requiring many specialists creating fragmentation of a dynamic and often chaotic process towards the final goal of client and user satisfaction. This is a dialogic process with competing participants which does have sequential activities which can be optimised by the application of rational, mathematical modelling i.e. the knowledge gained about cost, construction sequence and environmental design through the application of simulation techniques and computer modelling. The specialist architectural design technologist is educated to question the validity of architectural creations which are not technically resolved. Theirs is the future specialisation of 'nuclear' architecture (Emmitt et al, 2004); the total quality construction created by quality of thinking which permeates to detail design for assembly/disassembly and production within a collaboratively mechanised AEC team.

3.2. CONCLUSION: REVISING PERCEPTIONS OF AT: PROMOTING THE FUTURE SPECIALISATION OF NUCLEAR ARCHITECTURE

There is little research into the philosophy of detail design decision-making and this should include an exploration of an integrated approach to creative detail design, production and the management of the process (Emmitt et al, 2004).

The compositional language of design at the detail level and the symbolism of the constructional syntax is not an allegory of a metaphorical concept: a fiction. Rather, it is an auto-biography of the detail designers' poetics of assemblage and technological capabilities. It tells the story of its assembly and disassembly, its life-cycle and epilogue, its part in the local and global ecosystems and, ultimately, its contribution to humanity. The education of the architectural technologist should celebrate and promote creativity at the nuclear level.

For the discipline of architectural technology, what needs to be established is whether a mindset of enquiry, innovation and creativity is valued in academia and how this relates to expectations of technical design ability required for practice. It is essentially about dialogic versus logical design. Research should inform academia and practice and the role of

PSRBs in the evaluation and dissemination of paradigmatic detail design pedagogy, is critical to the strengthening of the architectural technology discipline and its perception as a specialist profession.

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