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**Transfer of design know-how from practice to education: reflections of a nascent
'practitioner-teacher'**

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Abstract

Architecture is the art of making. While a design studio in a school of architecture cannot cover everything that is done in professional practice, it certainly can and must rehearse them. Of course rehearsal is not the final production but it is essential for the success of the real act. Seen in this way, the teacher who enables this rehearsal has to take the responsibility for the transfer of know-how from practice to education. The author is fortunate to have been immersed intensely in the architectural industry by having worked at a significant practice that has a considerable reputation for good design in the manner in which form, spatial organisation, structure and fabric are assimilated; and the recognition of the value of integrated partnerships, which contributes to the success of projects. Using this background, and given the position of the author now as teacher, this paper reflects on 'practitioner-teachers' entering higher education, by investigating the transfer of design know-how by practitioners through teaching.

Preface

This paper began as an attempt to investigate the dilemma of transferring design know-how from practitioners to students. However, as a practitioner entering academia, the actual shift from practice to teaching posed a dilemma in itself. Thus, it was pertinent that the transfer of design know-how from practice to education be investigated through the lens of the nascent 'practitioner-teacher' by being based on experiential findings supported by research, and having no prescriptive intentions.

Introduction

Architecture resides in the realms of art and technology, which entails the creative and innovative design of representations of the built form via processes of enquiry and making. However, this *bimodal* (Schön 1984:4) nature of architecture challenges the approaches to teaching it. Based on Guttman's theories, Mary Kennedy states that "architecture schools [once] provided education in both engineering and design concepts, but gradually came to deemphasise the former and to define the profession of architecture as a field specialising in design. More recently, after a long period during which architects derived functional principles of design from social science constructs, the field has rejected these constructs in favour of intuitive aesthetic principles of design" (Kennedy 1987:138-39).

Although these aesthetic principles of design may, however, be strongly applicable to architectural education at traditional universities, teaching at universities of technology differ in approach, as they were previously geared to follow a vocational curriculum that concentrated on the training of a production workforce focussed on detailing, documentation and delivery (Young-Pugh 2005:35). The

current approach of these institutions, however, is to produce “*thinking hands* [in order] to create a vocationally orientated yet skilled and knowledgeable workforce” (Young-Pugh 2005:36), thereby challenging the teaching of architecture with regard to considerations of theory and technique.

In relation to this, Kennedy argues that programs offering theoretical knowledge are more advantageous than skilled-oriented programs, as they contribute to students acquiring a wider understanding of practice and the principles that guide it (Kennedy 1987:138). By contrast, John Brown and Paul Duguid argue that it is detrimental to focus on theory over technique, as the “valuation of abstract knowledge over actual practice...separates learning from working” (Brown & Duguid 1991:41). Similarly, Greig Crysler posits that the primary purpose of architectural education is to “produce graduates with marketable skills [even though] training is effectively removed from the marketplace” (Crysler 1995:211). Thus, the role of the ‘practitioner-teacher’ is significant for mediation between practice and education in the classroom, to ensure that the reality of practice is not overshadowed by theoretical content and methodology.

Currently, architectural education is differentiated from the systematic progression of professional knowledge that has been traditionally conveyed through the scientific model of teaching. It instead “revolves around the acquisition of artistry, through practice and coaching” (Schön 1984:2), as teaching in higher education moves away from *teacher-centred* or *transmission models* (Webster 2008:69), of which one of the most significant effects was the conversion of knowledge “to the benign status of information and skills” (Crysler 1995:211). Furthermore, apart from transmitting abstract knowledge “from the head of someone who knows to the head of someone who does not”, the learning environment was assumed unimportant and to specifically “exclude the complexities of practice and the communities of practitioners” (Brown & Duguid 1991:47).

However, with the advancement of the teaching model, the setting for learning also evolved into the environment in which “the design studio was conceived as a learning laboratory where skills and values could be brought to bear within the spirit of open enquiry” (Glasser 2000:250). Thus, by “permitting the development of a more democratic learning environment” (Crysler 1995:208), critical pedagogy is identified as an underscore to teaching, which recognises the movement towards theories that concentrate on the actions of the students rather than that of the teacher, and allows architectural education to reside with the “new model for the teacher as facilitator” (Webster 2008:70).

In support of student-centred learning, this approach rests relatively easily with practitioners teaching architecture, as they take the concept of facilitator quite naturally to the classroom, via their exposure to the communicative exchanges and engagements they have been accustomed to in their office environments. Thus, ‘practitioner-teachers’ utilise their expertise and experience in professional practice to speak to content and methodology, through their interactive approaches in the classroom. However, although they have the essential experience and/or qualifications in professional practice, ‘practitioner-teachers’ often do not necessarily carry the formal qualifications nor experience in teaching. As David Glasser observes, “few, if any, faculty enter the teaching ranks prepared to function as educators, as distinct from professionals. This is to say that most faculty, regardless of their abilities as practitioners, know very little about teaching skills – how people really absorb useful information – and then become useful practitioners” (Glasser 2000:250).

Hence, ‘practitioner-teachers’ entering higher education in permanent academic positions, cannot do so without some form of teacher development programme offered to them by that tertiary institution,

which is intended to assist teachers in “[developing] their practice in higher education teaching, learning, and assessment” (TDP Programme 2011:1) and to ensure that the standards of higher education are met. It allows ‘practitioner-teachers’ to aim their insights, which have been gained through practice, more meaningfully at the appropriate levels necessary to achieve the required outcomes in higher education. Hence, the context of the TDP makes Kennedy’s use of the term *andragogy* (a technique of teaching adults) to emphasise the task of professional education (Kennedy 1987:161), appropriate when referring to architectural teaching and learning in higher education.

Thus, to investigate the challenges of ‘practitioner-teachers’ in the transfer of design-know-how from practice to education, this paper explores selected theories behind the architectural thinking of practitioners as well as the pedagogy of teachers. It investigates the challenges of preparing students to meet the requirements of industry, by showing the alignment of the practical and pedagogic components via their interpretation and application, in order to meet the necessary outcomes.

Thinking by knowing

Ikujiro Nonaka infers that practitioners design through a discourse between *tacit and explicit* knowledge (Nonaka 1994:14), where the latter is communicable through an unambiguous language or means of documentation. According to Michael Polanyi, tacit knowledge conversely *indwells* (cited Nonaka 1994:14), because the instinctive knowing of practitioners exceeds their actual explanation of that knowing. Deemed as “knowing in practice” (Schön 1984:3), design knowledge is therefore concealed in the minds of practitioners.

Considering this, ‘practitioner-teachers’ must convey *tacit* knowledge, which is implicit in their design actions, to students who in turn need to acquire an aptitude for that innate performance. Donald Schön’s investigative theories on reflective practice and learning are a means to reveal this. He recognises *reflection-in-action* as that which practitioners employ whilst designing, in order to immediately investigate and experiment with variable solutions (Schön 1984:9). Thus, in order for students to acquire design knowledge from the ‘practitioner-teacher’, Schön argues that *reciprocal reflection-in-action* occurs via a dialogue of “demonstrating and imitating, telling and listening”, as well as through suggestions, descriptions, active engagement and translated performance (Schön 1984:6). Through this process, the student learns both about design and how to design (Schön 1984:6), which then makes not only the act of designing important, but also places emphasis on the components of design, which include creativity, innovation and regulations (among a few).

This forms part of the critical aspects of practical design knowledge that need to be transferred from ‘practitioner-teachers’ to students. According to Schön, teachers convey knowledge that is available “in the form of a repertoire of particular situations, exemplars and images” (Schön 1984:5) by drawing on past experiences. Thus, ‘practitioner-teachers’ utilise various aspects of information experienced through their encounters in practice, to recontextualise familiar scenarios and envisage ways to facilitate their students in new teaching situations. However, Schön reveals through his examination of the decision-making process, that new situations are contextualised through an *interpretative frame of reference* stimulated by analogy to another situation, where the use of different analogies might define problems differently, thereby having consequences of various envisioned solutions (Schön cited Kennedy 1987:148).

In addition to the philosophical articulation of tacit knowledge, the practical direction at its core has been identified by Nonaka as active participation and dedication within a specific environment, comprising not only *cognitive* but also *technical elements*, which are the “concrete know-how, crafts,

and skills that apply to specific contexts" (Nonaka 1994:16). Thus, if Leonard Waks states that "professionals learn design practice in the practica of their fields, [and] not in some generic course on methodology or design itself" (Waks 2001:48), then architectural education and training cannot concentrate on abstract knowledge without basing it on actual practice, as "tacit knowledge [is] learned not in the abstract but in the use" (Waks 2001:42). When 'practitioner-teachers' draw attention away from abstract representations of knowledge, the learning focus for students is then about "becoming a practitioner, not learning about practice" (Brown & Duguid 1991:48).

The contrasting *cognitive* elements of tacit knowledge, however, refer to the definitive perspectives of practitioners, which are created within the realms of their present realities and their consideration of future possibilities (Nonaka 1994:16). This may be supported by Pierre Bourdieu's theory of *habitus*, which is "a more holistic conceptualisation of the individual and the way individuals act in the world" (cited Webster 2008:68). Hence, students are *acculturated* by conducting themselves as members of the community and learning to function in that community through the acquisition of the perspectives of their society and by conversing in that language (Brown & Duguid 1991:48).

Habitus is further explored by Helena Webster as a counter to Schön's theories on practitioner and student reflection. It infers that "students experience architectural education as the sum of its explicit and hidden dimensions and it is this total experience that effects the development of students from novices to professional architects" (Webster 2008:66). Thus, architectural education goes beyond reciprocal reflection and embedding expertise in students by recognising the diversity of the "other cognitive, affective and corporeal dimensions to learning that take place both within the design studio and in other settings (the lecture theatre, the refectory, parties, etc)" (Webster 2008:66). Students can then build their perceptions out of a variety of resources (Brown & Duguid 1991:47), and by contributing "their personal habitus to an architectural education and through engaging with programmes of formal and informal learning" (Webster 2008:69), students align their individual habitus with that of the discipline.

Pedagogy

A relationship may be drawn between habitus and discourse, of which the latter is "the organisation of information within the perspective of that discipline" (Jacobs et al 2006:3). In addition to aiming beyond content toward the being of the discipline, discourse performs a significant role in developing students' academic literacy, as it comprises "intersections between language, content and thinking" (Jacobs et al 2006:3). It therefore supports the notion that students "reflect-in-action and in the languages specific to their practices. Even when they stop to reflect-on-action, they think in the language of practice" (Waks 2001:40).

Similarly, Schön's description of talking and drawing as the *language of designing*, may be identified as discourse, where "drawing is understandable only through the talking, and the talking has no meaning without the drawing" (Schön 1984:4). In relation to this, it is not only what the teacher says, and the behaviour that is attached to it, but also how it is said (Jacobs 2011:3) that is of significance to student learning. An interviewed student in one of Schön's investigations into studio education revealed that "[students] hang onto the inflection of the tone of voice in [crits] to discover if something is really wrong" (Schön 1984:4). Thus, as "language is only meaningful within a discourse which recognises it" (Jacobs 2011:6), verbal and physical expression of 'practitioner-teachers' contribute significantly to students' perceptions and understanding of content and feedback.

A pedagogical method to considering content and feedback is that of reflective practice for teaching and learning. Its use is encouraged in order to address “what is taught and how it is taught (curriculum and pedagogy)” (Recruitment Retention, n.d.). By challenging preconceptions of teaching and learning, reflection stimulates active awareness achieved through constant consideration of what is being done in the classroom, how it is being done and why; and is supported by the recognition and identification of the connections between teaching and learning theories in relation to student outcomes.

Means of reflection include both *unstructured* and *structured* (Morton 2009:24) forms. Unstructured reflection occurs spontaneously during informal engagements with peers and students, listening to other experienced teachers, as well as through reading and research (Morton 2009:24). Structured reflection incorporates methods of reflection-in-action and reflection-on-action (Morton 2009:24), which occurs during and after teaching and learning sessions, for teachers to consider and reconsider approaches to student learning, presentation of content, engagement with students, and style of teaching. Through this process, the principles of enquiry-based active learning are executed.

Enquiry-based active learning forms part of deep learning, which entails “outcomes that reflect higher order thinking (deep learning); and that teaching towards them must be about students constructing knowledge (deep learning)” (Garraway 2011:1). Designed for outcomes based teaching, Biggs’ constructive alignment considers learning outcomes, teaching and learning activities, and assessment tasks together and in relation to each other. It focuses on the primary concepts of students who construct meaning from doing in order to learn; and teachers who align learning activities with learning outcomes as a means for students to take responsibility for their learning (Houghton 2004). In order to encourage learning by doing, activities and knowledge types are related to the students’ cognitive processes through the use of taxonomies. The original concepts of Bloom’s taxonomy, which conceptualised the cognitive domain, have been redefined by Anderson and Krathwohl to elicit “more useful and comprehensive additions of how the taxonomy intersects and acts upon different types and levels of knowledge” (Wilson 2006), thereby addressing the different learning styles of students.

Application

The translation of architectural education from the 19th century apprenticeship model to its current institutional setting has been categorised by Webster as the following: *pedagogic space – the architectural office became the design studio; pedagogic tool – architectural design problems became simulated design problems; and pedagogic method – learning design artistry via coaching from the architect became learning design artistry via coaching of from design tutors* (Webster 2008:64). Thus, the role of ‘practitioner-teachers’ is significant in the use of *pedagogic methods* to engage *pedagogic tools* within a *pedagogic space*. By interpreting Webster’s categorisation in terms of the preceding research, notions of deep learning; habitus; discourse; reflection and deliberate action; and practica may be considered by ‘practitioner-teachers’ to negotiate a cohesive approach to teaching.

Furthermore, critical pedagogy may be used to assimilate “how knowledge is constituted, by whom, for whom, and for what purpose” (Crysler 1995:208). Thus, the ‘whats’ and ‘hows’ of practice and teaching may be explored in relation to the practitioner, the student, and the ‘practitioner-teacher’ in the following manner: what does the practitioner require and do, and how is it achieved; what is required of students in the workplace, and how do they apply their knowledge practically in order to perform

tasks; what does the teacher convey in the classroom, and how is it executed to prepare the students to interpret and fulfil practical requirements.

In the workplace, students with technical backgrounds are generally required to interrogate design from a technological standpoint in order to contribute to the creation of workable design solutions. To do this effectively, students need to understand and interact positively with construction methods and materials as part of design conceptualisation, development and resolution. Thus, 'practitioner-teachers' adopt a similar approach in the studio, where design and technology work together seamlessly, and where technology is encouraged as a design generator. Part of this, is the integration of course modules to ensure that students do not view design and technology as individual subjects, but rather as an assimilated engagement that is essential to the design process.

Deep learning

In order for students to interact with these integrative concepts and develop their skills in the analysis of problems as well as identification and application of appropriate information for the accomplishment of tasks, students are guided through their development as opposed to being provided with solutions. Problem-solving and setting formulated within a cohesive context of projects and overlapping course syllabi integrated within the overall programme contribute to the structuring of achievable individual outcomes. To develop their individual filters and approaches to architecture, students are facilitated through ways and means of achieving outcomes, without necessarily being provided with a solution to a given problem.

This contributes to student readiness, which entails an understanding of what is required in order to consider how to perform a given task. To execute it accordingly, students must correctly perceive and apply the knowledge that has been conveyed in a new but familiar context. This enquiry-based approach is based on constructive alignment and cognitive taxonomies, which balance the desired outcomes of higher education with the requirements of industry in order to model a curriculum and teaching methodology that allows students to develop within the contextualised realities of the discipline. The combination of formal and informal teaching and learning activities by 'practitioner-teachers' results in the students' "deep approach to learning" (Webster 2008:67), and assists in negotiating approaches to teaching in different environments of large groups and small groups, as well as accommodating students' varying learning styles.

Discourse

Addressing learning styles for academic literacy includes achieving a balance between talking and drawing in studio education. Although some students need studio teachers to draw consistently in crits in order for them to understand certain concepts and approaches, it is a concern that students will not extend themselves to derive their own options and solutions if studio teachers draw excessively. On the contrary, studio teachers purely talking in crits does not allow students the opportunity to envisage certain possibilities, which are only available through the experiential reflections and deliberation of the 'practitioner-teachers'. Hence, as opposed to initially imparting a drawing onto students, which may be imitated by them and subsequently restrict their design development, a combined strategy is required, in which the 'practitioner-teacher' facilitates the resolution of students' ideas by drawing as they progress through their designs.

Also, given that the practice of architecture is very much, if not predominantly, about conversing with others, it is important that students learn about discourse through communication, in order for them to engage with clients and counterparts upon entering the workplace. Brown & Duguid outline that students “need legitimate access to the periphery of communication – to computer mail, to formal and informal meetings, to telephone conversations, etc, and of course, to war stories. They pick up invaluable ‘know-how’ – not just information, but also manner and technique – from being on the periphery of competent practitioners going about their business” (Brown & Duguid 1991:50). Hence, although design courses are run in studio and not in offices, ‘practitioner-teachers’ engage in discourse to expose students to these communicative exchanges in industry by expressing how information is transferred in practice and the readings associated with it.

Habitus

Glasser observes that the purpose of the teaching profession is to educate students to develop into practitioners and competent professionals who will contribute to the well-being of society (Glasser 2000:251). Practitioner-teachers’ therefore encourage student understanding of global and local societal concerns and the establishment of community values when dealing with issues concerning the public domain. Thus, their “educational focus prioritises engagement with ethical, contextual, social, and environmental issues rather than idiosyncratic formal and spatial expression” (Young-Pugh 2005:36).

In addition to equipping students with methodological means of dealing with humanitarian challenges, the integration of appropriate interdisciplinary readings, building and exhibition visits, informative talks and lectures, as well as online social networking tools into studio courses also stimulates discussion and debate in order for students to grapple with the responsibilities of the architectural profession. As well as to support their consideration of the “broader implications of their design decisions and production methods” (Young-Pugh 2005:39), students are encouraged to be innovative with design and technology and consider careful use of resources, budgets and construction methods.

Reflection and deliberate action

As identified earlier, the process of reflection forms a large part of designing in architecture – both in practice as well as learning and teaching. Schön identifies reflection in the architectural profession and education as essential to “cope with uncertainty, uniqueness, and value-conflict” (Schön 1984:5). Successful deliberation, therefore, requires “a body of experiences on which to draw, the ability to conduct mental experiments, the ability to critically evaluate their outcomes, and the ability to revise one’s definition of the situation if not satisfied with the solutions the mental experiment yielded. In addition, it requires a highly developed sense of purpose, for purpose is the criterion against which both ideas are judged” (Kennedy 1987:149).

If Kennedy declares that “the intellectual task of deliberate action is not problem *solving* – the weighing of alternatives to reach a predetermined end – but instead is problem *setting*, where goals, means, and ends are all weighed together” (Kennedy 1987:151) then this necessitates that students must take responsibility for their own academic and professional development by formulating goals and conducting experiments to analytically test ideas in order to reach an appropriate solution (Kennedy 1987:158). Thus, it is significant that ‘practitioner-teachers’ encourage students to deliberate in order for them to define their own problems and find solutions through decisive examination as well as the careful consideration of consequences in relation to their original goals (Kennedy 1987:149).

By students and 'practitioner-teachers' reflecting together in the studio environment, students participate fully in the design process by engaging with the 'practitioner-teacher' as well as learning from their experiences through observation, analysis, action, evaluation and revision, thereby encouraging the "[transformation] of students into thinkers capable of deliberation and deliberate action" (Kennedy 1987:149).

Practica

Waks identifies that Dewey and Schön differ in their exemplification of how reflective practice is learned: for John Dewey it is learned-by-doing in the scientific laboratory; whilst for Schön, it includes ways of thinking that are specific to professional practice in the design studio (Waks 2001:40). However, Schön does relate to Dewey in his notion of *heuristic teaching*, whereby "teaching in professional education settings is primarily coaching – heuristic teaching – facilitating learning-by-doing (as opposed to just memorising or discussing outside of an operational context) through a combination of demonstrations and operational descriptions / explanations" (Waks 2001:47).

In support of this notion, Brown and Duguid recognise that learning theorists Lave and Wagner "have rejected transfer models, which isolate knowledge from practice, and developed a view of learning as social construction, putting knowledge back into the contexts in which it has meaning" (Brown & Duguid 1991:47). This aspect of learning-by-doing is explored further by Kennedy, who noted Guttman's investigation of two opposing viewpoints regarding studio design: "the first side, which Guttman calls 'purists', advocates that studio design should deal with pure design issues, even if they must be presented to students in an unrealistic way. The second side, which Guttman calls 'stimulators', argues that studio design is where budding architects should come to terms with client desires, building codes, costs of materials, feasibility of structures, and so forth" (Guttman, cited Kennedy 1987:159).

Thus, 'practitioner-teachers' offer a combination by which specific ways of thinking are encouraged in the design studio where students actually perform tasks specific to professional activities in order to facilitate learning, as "practice is central to understanding work" (Brown & Duguid 1991:40). 'Practitioner-teachers' therefore reject the "purists" viewpoint of the unrealistic way to learn design, and take a practice-based approach to learning-by-doing through linking creativity, innovation and practice in the context of reality, to assist students in understanding why and how to apply certain design principles within the complexities of making buildings and spaces. Part of this process entails decision-making and committing to ideas, which is emphasised by 'practitioner-teachers' in relation to the pedagogical and practical principle of time management. This is learned-by-doing in the studio, as there is "a frantic pace of knowledge consumption, [where] the emphasis is on getting things done, on establishing what is required and meeting those conditions as quickly and efficiently as possible" (Crysler 1995:212). It is significant that students are accustomed to time management, as the reality of practice is based on the efficient management of time and production of results within a limited time allowance.

Conclusion

In practice, no 'answer' to a design problem can be prescribed or definitively correct. Practitioners identify ways and means to approach outcomes through systems of analysis and evaluations in order to ascertain the most appropriate solutions to the given problems within their specific contexts. The more the practitioner is accustomed to this, the easier it becomes to execute the process meaningfully, as well as meet the objectives and deadlines of the tasks, because "the ability to successfully deliberate about

courses of actions develops over time by observing one's own actions and their consequences" (Schwab, cited Kennedy 1987:148).

Hence, 'practitioner-teachers' participate in the transfer of design know-how by preparing students so that they become akin to these processes. This is achieved by making workplace scenarios recognisable to students and ensuring that they are equipped to negotiate related tasks knowledgeably. By incorporating notions of deep learning, discourse, habitus, reflection and deliberate action, and practica, into the course, the curriculum then extends toward industry without compromising the quality of higher education being delivered. This is maintained by ensuring that 'practitioner-teachers' who have had no previous training in education are assisted by the TDPs with teaching and learning methodology, development theories and literature, in order to substantiate their teaching. It is of further assistance in the transfer of design 'know-how' from practitioners to students, as it entails an understanding of how students perceive and absorb information, thereby allowing the 'practitioner-teacher' to model teaching accordingly, which includes enquiry-based learning as a significant approach.

However, this does pose a challenge in some instances, as students sometimes find this approach difficult to accept because they would prefer that the 'practitioner-teacher' provide them with what they deem to be the 'correct' solutions in order to achieve an outcome (or that which they believe is desired by their lecturer). Part of this dilemma is because students tend to think in boxes. Thus, by viewing their subjects as separate entities, they do not consider their courses in relation to and supportive of each other. This contributes to defeating enquiry-based learning, as the students do not identify and relate the outcomes of their tasks to the entirety of their course and the integration of the syllabus – which possibly contributes to why they prefer information to be prescribed to them. However, this mindset hinders their exposure to possibilities of the variety of approaches that they may be able to explore and develop by applying their knowledge to reach an outcome.

Similarly, a further challenge of the 'practitioner-teacher' that of assisting students in relating general design principles to specific situations, because as Kennedy argues, "professionals need to solve problems and make decisions in ambiguous situations [and] to include not just applying skills, but recognising situations in which it is appropriate to do so" (Kennedy 1987:138). This may be attributed to students not interpreting and assimilating various design aspects within a holistic context. Similarly, they struggle to derive and merge interdisciplinary principles that are supportive of and applicable for the completion of their architectural cases. Although the theory and application can be conveyed to students through discussion and project examples, the actual implementation of those principles in the students' design projects poses to be a challenge. It is necessary for 'practitioner-teachers' to drive this approach in the classroom in order to expose students to such thinking so that they are familiar with the integrative requirements of the workplace, in order to be productive in offering innovative holistic solutions at a desirable rate.

Hence, time management is very significant in the preparation of students for practice. However, students often feel that they have insufficient time to explore new concepts and methods, and thereby struggle to make timeous decisions and commit to solutions for completion of studio projects. The "ability to excel is contingent on the student's ability to produce the time to do so. The production of time and talent are therefore directly linked" (Crysler 1995:212). It is, therefore, unclear as to how students are able to allow design to develop freely out of experimentation without the limitations of time. And because every student works at an individual pace, the timeframe for experimentation cannot be cast, as the 'light-bulb' moment happens sporadically for each student.

If the students do pursue the experimental route, it is with the consequence of scrambling to meet a submission deadline with some semblance of a final product. After all, students view learning through the lens of assessment, where they evaluate their outcomes on the mark achieved for their final product; and although teachers are often more concerned with process rather than product, it is necessary that students submit work within the given timeframe, as would be the case in an office, because the studio is rehearsal for practice. It is ambiguous as to when and where else students will incubate these new ideas and methods if not at the educational institution. How 'practitioner-teachers' allow for this exploration to occur, whilst maintaining measures that prepare the students for the workplace poses a dilemma.

'Practitioner-teachers' contribute to the preparation of students for the workplace, in a context of opportunity so that they are equipped to proactively perform beyond a mere 'copy-paste' syndrome, toward a realm of creativity and innovation. Thus, 'practitioner-teachers' aid the dialogue between the academic realm and professional practice in order to model a learning experience that encompasses a sound theoretical, technological and practical base, which reflects the challenges of the profession whilst nurturing student growth in an encouraging environment. However, the paradox of negotiating the freedom for student exploration within restricted timeframes remains perhaps one of the greatest dilemmas for the 'practitioner-teacher' in the transfer of design know-how from practice to education.

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