The Journey from Novice to Expert

Becoming Curriculum Designers and Learning Facilitators in Singapore's Diploma of Adult and Continuing Education (DACE) Programme

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The Institute for Adult Learning (IAL) aims to contribute to the competitiveness of Singapore by developing an effective, innovative and responsive Continuing Education and Training (CET) sector that is able to meet the needs of industries and the workforce. It achieves this by raising capabilities, catalysing innovation, and leading research in workforce learning.

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Executive Summary

The research for this report is the second stage of the *WSQ Diploma in Adult and Continuing Education: Curriculum and quality courseware designers* project (The DACE project). The two stages investigated issues related to the effectiveness of DACE graduates in designing, implementing and facilitating quality WSQ curricula, and also traced their professional development journey before, during and after participation in the DACE programme. The aim of this two-pronged approach was to assess the readiness of DACE learners for their roles post-2015 as mandated Approved Training Organisation (ATO) curriculum designers, which requires providers to employ at least one DACE graduate to manage the development and implementation of Workforce Skills Qualifications (WSQ)-related programmes.

The evidence from the first stage of the project suggested that DACE graduates tended to be 'compliant' rather than 'interpretive' curriculum designers, meaning in effect that they lacked the capacities demanded of an innovative, reflective and capable educator, a key DACE programme expectation. This finding suggested to us that DACE graduates might not be ready for their post-2015 role. Though initially disappointing, this conclusion was soon challenged by the second stage of the project which suggested that in their journey from novice to expert, DACE graduates are increasingly demonstrating through workplace practice that they possess emergent skills as competent and skilled curriculum designers and learning facilitators who are able to respond innovatively and knowledgably to the new expectations placed on them. This noticeable shift in perception between the 2010-2011 and 2012-2013 interview cohorts was most likely due to the rapid maturing of the DACE programme over this brief period, including wider acceptance by industry of the new graduate skill sets. It was perhaps also of value to ATOs that these novel approaches produced a further 'bottom-line' effect of increased demand for DACE educators. Though not all DACE graduates exhibit these new attributes the research suggests a strong trend in this direction.

The report is divided into three sections. First, we introduce the DACE programme and its context with the Continuing Education and Training (CET) sector and Workforce Skills Qualifications (WSQ) framework. This is followed by a brief outline of the research questions, project methodology and data analysis approach. Second, we describe and analyse the 'novice to expert' literature and make some claims in relation to its strengths and weaknesses. Third, we provide a detailed summary and analysis of the collected interview data. Fourth we conclude the study with recommendations for course designers, learning facilitators, and CET managers and employers. The following is a list of the recommendations discussed in the final chapter:

Recommendation One. We suggest that curriculum designers in programmes such as DACE, when considering using the Dreyfus and Dreyfus stage model of professional development, and indeed any related model that offer a linear and simplistic developmental process, do so with caution, taking note that learners bring with them prior knowledge and workplace practices that add complexity to any

described 'stages'. For example, learners are rarely 'novices' in the true sense of the word as most are adults with considerable experience in their fields of expertise. As such programme design should include activities to draw out and use these experiences or 'embodied understandings' at all stages of the programme design through such strategies as reflective practice and action learning.

Recommendation Two. We suggest that DACE course designers build into any future programme revisions activities that acknowledge and make use of mutually supporting classroom peer groups. The support could also be extended to possible activities and assessment outside the classroom, particularly when groups participate as members from the same organisation.

Recommendation Three. We suggest that DACE course designers continue to include a range of activities that model adult education facilitation and assessment best practice.

Recommendation Four. We suggest that learning facilitators remain aware of the powerful influence they have as practice-based role models to their learners and seek opportunities wherever possible to maintain and extend their educational expertise through formal and informal professional development.

Recommendation Five. We suggest that CET managers and employers assist in raising the workplace status of curriculum designers through offering better remuneration for course development projects. Until this occurs there is likely to be a shortage of applicants for positions in the post-2015 training environment, which requires all ATOs to employ a curriculum designer as part of their legal obligation to WSQ curriculum quality assurance processes.

Recommendation Six. We suggest that CET managers and employers acknowledge the additional professional skills of DACE graduates and permit greater degrees of latitude in interpreting the curriculum for delivery within stated WSQ programme outcomes.

While we have attempted to privilege curriculum development over learning facilitation with a view to assessing the capabilities of designers in the post-2015 environment, the direction of the research suggests that the 'typical' DACE graduate considers curriculum design as an adjunct to a primary role as a skilled and professional adult learning facilitator. It appears that until the status and remuneration levels of curriculum design are raised to match that of learning facilitation, it may be difficult for ATOs to meet their obligations in this area. We see this as a challenge requiring attention in the immediate future.

1.0 Introduction

1.1 Introduction

This report is the second stage of the *WSQ Diploma in Adult and Continuing Education: Curriculum and quality courseware designers* project (The DACE Project). The DACE Project arose as a response to stakeholder concerns about the need for Singapore to have a pool of adult educators able to design quality courses and courseware and model learning facilitation expertise. From 2015, all of Singapore's Approved Training Organisations (ATOs) will be required by the Singapore Workforce Development Agency (WDA) to employ at least one curriculum designer who is a graduate of the Diploma in Adult and Continuing Education (DACE), first introduced to the Continuing Education and Training (CET) sector in 2010. The WDA strategy is to ensure that each ATO is able to generate for its learners curriculum design and courseware of the highest quality. It is therefore important that the sector is able to say with confidence that DACE graduates are indeed specialists and experts in their field who can play the important role of enabling quality curriculum development as well as guide expertise in learning facilitation within each organisation.

To enable us to assess qualitatively the DACE programme's capacity to produce graduates able to write quality curriculum and model high learning facilitation standards, we asked the following research questions:

1. What does 'quality' curriculum mean to different people?

2. How do individuals experience their journey towards becoming developers of high quality curriculum and modelling best practice learning facilitation?

The first question was addressed in the DACE Stage One report (Bound, Rushbrook and Sivalingam, 2013). Question 2 is the subject of this report. Reference to the first report will be made where appropriate.

We now locate the DACE programme within the context of the earlier development of the WDA and its WSQ frameworks. This will assist in outlining the reasons for the development of DACE and its perceived need to offer more sophisticated curriculum design tools as well as broader based learning facilitation skills than the sector's initial qualification, the Advanced Certificate in Training and Assessment (ACTA). We also include an outline of the methodologies used to gather and analyse the project data. The chapter concludes with a summary of the main points made and a description of the remaining chapters constituting Stage Two of the research project.

1.2 Background and Context

WDA was created in 2003 and inherited a disparate CET sector with a diverse community of trainers, the majority of whom did not have a training qualification. There were a few institutions that provided some sort of training credential but there were no minimum trainer standards. Trainer quality control was, therefore, a major concern. The WSQ system was developed to increase employability, improve worker performance and align industry needs with training provision. This required a certain level of skill in learning facilitation, assessment, curriculum, and courseware development not present in the adult educator workforce (Willmott & Karmel, 2011).

WDA's first system-wide qualification, ACTA, was introduced in 2005 to provide a basic training credential. The programme was developed using a Competency Based Training (CBT) approach. It soon became clear, however, that ACTA alone could not meet the needs of a rapidly changing CET sector. Rather, the sector required professionals with additional abilities to address complex workplace training issues and gaps in innovative ways, contextualised to meet the unique needs of specific sectors and employees. Within the implied critique of ACTA was also the suggestion that a CBT approach alone was not sufficient to encourage the development of these new capacities.

The evolution of vocational training in countries such as Australia, the United Kingdom and Canada was moving beyond the boundaries of CBT where there are high level and less rigidly CBT-based qualifications articulating to a range of higher education courses. Cross-accreditation and the breaking down of educational silos was better served through the creation of graded assessments, which was considered better matched to academic requirements (Clayton, 2009; Simons, Harris & Smith, 2006).

Generally, it was the thinking within sections of WDA that ACTA was producing graduate cohorts who struggled to see beyond the relatively narrow framework of CBT curriculum-making and practice. It was felt that the existing WSQ system seldom encouraged sectoral change or critique within the body of practitioners working within the CET sector, a set of skills deemed essential for the sector to prosper into the future. DACE was launched in 2010 to address this perceived inadequacy (interview with former senior WDA manager, April 2012).

1.3 The Diploma of Adult and Continuing Education (DACE)

DACE encouraged trainers to revise and reflect on ACTA's taken-for-granted assumptions. For example, one of the new modules introduced was *Develop Practice through Reflection*, which encouraged learners to be critically reflective on past curriculum design, writing and facilitation practices.

A further perceived limitation of ACTA was its non-inclusion of a practice-based or practicum component. In many cases this meant that programme participants may

never have facilitated a learning session prior to completing the programme. The lack of an extended practicum provision was due primarily to the inability of the sector to cope with the large numbers studying ACTA and the challenge of finding placements within a CET culture unfamiliar with the practice. A practicum component was introduced into DACE because there was a need felt to elevate the development of programme participants beyond ACTA to experience meaningful professional exposure through workplace activities emphasising reflective practice and a wider view of assessment. ATOs and CETs soon recognised, too, that practicum placements were vital to the continuing success of the adult education sector.

DACE was intended to be more than a skills qualification in CBT, which was the original brief of ACTA. It also introduced learners to specialist study streams such as curriculum design, e-learning, facilitation skills, assessment and research, permitting learners to develop expertise within a range of fields

Many of these ideas were outlined in a 'Training Roadmap' (WDA, 2009), which outlined a range of possible future adult education qualification options, including DACE, and various additional qualifications, including graduate diplomas and workplace training certification, in addition to links with two specialist international masters programmes. Some WDA-appointed consultants believed it was sound preparation to have a diploma or similar qualification placed in a training pathway as ACTA alone leading to a Masters degree was deemed too wide a gap to bridge. To ensure all DACE outcomes were pulled together reflectively in preparation for graduation and adult education practice, with the possibility of further study, a capstone assessment project was included to complement the practicum.

DACE, therefore, was deliberately created as a 'value-added' curriculum-making and learning facilitation qualification for the CET sector and mooted as mandatory for future ATO-based curriculum design. ACTA, too, was considered by the WDA as essential entry-level training and from 2010 was made mandatory for WSQ instruction purposes.

Following the introduction of DACE, the Institute for Adult Learning DACE Project was constructed in 2011 to assess the programme's impact on WSQ curriculum writing approaches and related learning facilitation practices. First to be considered was the meaning attached by curriculum writers to the idea of 'quality' curriculum. This was teased out in the *What is Quality Curriculum?* report (Bound, Rushbrook and Sivalingam, 2013) which also contributed to the creation of a Reflective Curriculum Development Approach (Rushbrook, Choy and Tan, 2013) to facilitate further qualitative curriculum-making within the Singaporean context. This second research report investigates the journey made by DACE learners from a perceived position of 'novice' curriculum writers and learning facilitators to one of 'expertise' in the field. The report makes use of the accepted novice-expert literature to analyse the thoughts of DACE learners captured through semi-structured interviews.

Of interest to us as researchers is an apparent disparity between the first and second reports in relation to the idea of curriculum and learning facilitation practice. Whereas the first report revealed a relatively poor uptake or understanding of the notion of 'quality' curriculum and diverse facilitation practice by CET-based

educators, this second report suggests evidence that provides an encouraging view of DACE graduates as curriculum and learning facilitation innovators and change-agents, in spite of experiencing the same organisational frustrations for implementation examined in the first report. This change of trajectory may be explained by the eighteen month data collection gap between the two projects which suggests a rapid shift in thinking from the time of the introduction of the DACE programme to its maturity over the period researched. It also suggests that an explanation of this shift may be usefully framed through the lens of the novice-expert literature, though not without some criticism, as we shall reveal.

1.4 Methodology

1.4.1 Guiding Question and Sample

Stage Two of the DACE Project makes use of qualitative data drawn from two sets of semi-structured interviews conducted in late 2010 and early 2011 (n=10), and late 2012 (n=10). This gives the data a degree of longitidinality and comparability which will be used to reveal the shifts in attitudes mentioned in Chapter One.

The interviews were used to gather and analyse information on the project's second guiding question:

> *How do individuals experience their journey towards becoming developers of high quality curriculum and modelling best practice learning facilitation?*

The interviewees comprise learning facilitators and practitioners experienced in the development, implementation and facilitation of curriculum and courseware. All are DACE learners and graduates who have developed their skill sets through prior or current industry-based training experience.

Once the data was gathered, it was analysed using a categorical analysis approach of first coding or identifying themes within the interviews and later collapsing them into higher order categories. These identified first and higher order or 'superordinate' categories form the basis of an analytical narrative that explores ideas suggested by the research question.

1.4.2 Interview Method

Respondents were interviewed using a semi-structured question protocol which posits shared core questions across an interviewee cohort but permits exploration of responses through interviewer conversational 'follow-up' questions (Lankshear & Knobel, 2004, pp. 201-203). This permits greater inter-subjectivity within the interview process and the possibility of deeper, broader and enhanced agential responses (Fontana & Frey, 2005, pp. 695-727). Core questions were developed through research team meetings and refined through trial interviews. The rationale of the process was to garner interviewee information relating to their work backgrounds, plus theoretical and practical understandings and reflections on the idea of their journey from novice to expert.

1.4.3 Analysis

As suggested the mode of data presentation uses a themed and storied approach that privileges research project actors through acknowledgement of their agential roles as curriculum practitioners and learning facilitators (Roberts, 1996; Chase, 2005). While the narrative reflects the central ideas developed in the literature review under the guidance of the research project question(s), it also celebrates the diversity of opinions and practices expressed that both affirm the project's intentions while also transcending its boundaries (Chase, 2005, p. 671).

The interview data forms the core of the narrative. It draws on Coffee and Atkinson's 'categorical analysis' approach (1996), a method not dissimilar to that used by Strauss and Corbin (1990). The data was first read and extensive notes taken suggesting a range of common themes or 'codes' across all gathered materials. These themes were then isolated and further clumped and abstracted into higher and more abstract 'superordinate' categories, sometimes by as much as three levels (Coffee & Atkinson, 1996, pp. 41-20). Through a reflexive and iterative process the data was read and re-read and added to, or shifted within, the extant categories until 'data saturation' (Strauss & Corbin, 1990; Sarantakos, 2001, pp. 202-205) was determined. That is, no significant new categories were discovered and all emerging data could be placed within existing superordinate categories. The analysed data was then used to construct the narrative.

1.4.4 Project Limitations

Stage Two of the DACE project makes a modest claim that it confidently accounts for the thinking of and reflections about a group of DACE learners and Singaporean adult education practitioners. The generic ideas expressed about the journey from novice to expert clearly will resonate far more widely than the individuals interviewed, but cannot be claimed to be representative of all adult educators. Similarly, the particular ideas expressed about Singaporean adult education can only be attributed accurately to those interviewed, who are small in number. However, the themes revealed will most likely resonate, too, with a larger audience and hopefully excite further discussion and debate.

1.5 Summary

This chapter has briefly reviewed the idea of 'quality' curriculum, which has been considered in the DACE Stage One *What is quality curriculum?* report. The report is part of the wider *WSQ Diploma in Adult and Continuing Education: Curriculum and quality courseware designers* project (The DACE Project). This DACE Stage Two project and report considers the journey of the DACE learner from 'novice to expert' curriculum-maker and learning facilitator. The report was informed by a novice to expert literature review and a series of semi-structured interviews. We have also included an outline of the methodologies used to gather and analyse data.

The next three chapters further elaborate the themes outlined above. Chapter Two presents a critical review of the novice to expert literature. This will assist in shaping

the context for the later presentation of the project data. Chapter Three presents an overview of the collected interview data. The final chapter brings together the literature and the interview data to assess the validity of the novice to expert metaphor and its account of the development of expertise within Singapore's CET sector. The chapter will conclude with recommendations for future practice.

2.0   Literature review

2.1 Introduction

This chapter teases out, discusses and critiques Dreyfus and Dreyfus's 'Novice to Expert' stage model of professional development (Dreyfus and Dreyfus, 1980, 1986), for several decades the dominant conceptual metaphor in the field. We agree that the model has widespread currency and value as an explanatory tool, but not uncritically. We make use of the available literature, with particular emphasis on the work of Dall'Alba and Sandberg (2006) to reconfigure the metaphor for our purposes. In sum, while we acknowledge the value of the Dreyfus and Dreyfus's idea that professionals work their way from less to more expertise through a continuum that at various points may be labelled as stages, we agree with Dall'Alba and Sandberg that these 'stages' are rarely unilinear or focused inwardly on individual cognitive issues alone. Rather, we make use of their reading of 'embodied understanding' which suggests that professional learning occurs within specific learning environments that extend beyond individual cognition to include dialectical interplay with workplaces and other socio-cultural contexts. Within these contexts the individual may also bring to learning prior biographical experience and knowledge. The manner in which these socio-cultural attributes relate iteratively within the novice to expert journey, then, becomes profoundly multi-directional and complex. Though Dreyfus and Dreyfus acknowledge these issues, we support the critical literature that suggests the processes involved are insufficiently interrogated. We also agree with Dall'Alba and Sandberg that this process of journey and increased professional understanding and practice accords closely with Giddens' ideas related to individual agency within interactive contexts: 'practice is constituted neither by an objective structure constraining professionals' action nor by the professionals' subjectivity, as sometimes claimed. Rather, practice is intersubjectively constituted through mutual understanding of a specific institutionalised order enacted by individuals' (Dall'Alba and Sandberg, 2006, p. 385). We now explore these summary ideas in more detail.

2.2 Professional Skill Development

Professional skill development in a particular field involves formal and informal learning, educational institutions, workplace and managerial systems (Dall'Alba & Sandberg, 2006). Formal learning takes place in the form of professional courses and programmes in educational institutions as well as structured activities in the workplace which is often accompanied by managerial systems of appraisal, career progression and incentives. Informal learning also shapes professional skill development through 'day to day work of the professionals concerned – a kind of on the job training' (Dall'Alba & Sandberg, 2006).

2.3 Traditional and Contemporary Cognitive-based Models

In the earlier decades of study of the professional skills development cycle, there were many traditional and cognitive-based models or approaches. These models or approaches consisted of two components, namely, *professional skills* and *professional practice*. For the first component, both traditional and cognitive-based models define *professional skills* as a set of attributes, namely, knowledge, skills and attitudes. These sets of attributes, it was claimed, could be identified, removed from the setting in which they occur and formalised into content that could be taught in a professional education setting (Dall'Alba & Sandberg, 2006). The second component, *professional practice*, presupposed that the context in which the learning of the professional skills took place was like a vessel that replicates 'an objective structure consisting of institutionalised social rules and norms' (Lave, 1993), thus assuming and creating generalisable characteristics of a workplace context in a professional education setting. Hence the underlying assumption was that the workforce that is taught professional skills and trained in a pseudo-professional practice vessel can employ the learnt set of attributes in real-life workplace settings and be able to perform within it successfully (Dall'Alba & Sandberg, 2006). This led to the assumption that professional skills and professional practice could be theoretically and practically separated (McDermott, 1993) and then brought together unproblematically in workplace settings.

This 'traditional' notion of professional skills development has recently been challenged in a range of theoretically informed research studies (Ball & Cohen, 1999; Benner, 1984; Billett 2001; Borko & Putnam, 1996; Dall'Alba, 2002, 2004, 2009; Dreyfus & Dreyfus, 1986; Dreyfus, 2002; Dall'Alba & Barnacle, 2005; Dall'Alba & Sandberg, 1996; Fielding, 1988a; Hargreaves & Fullan, 1992; Hunt, 1987; Lave, 1993; Little, 1993; McDermott, 1993; Sandberg, 1994, 2000, 2001; Sandberg & Pinnington, 2009; Schon, 1983, 1987; Tsoukas, 1996; Tsoukas & Vladimirou, 2001; Winograd & Flores, 1986). The seminal response to the 'traditional' professional development approach and its assumptions was the influential skills acquisition model constructed by brothers Hubert and Stuart Dreyfus (1986; Dreyfus, 2002) where it was subsequently used in an array of professional skills training frameworks, such as nursing (Benner, 1984; Benner, Tanner & Chesla, 1996), teaching (Berliner, 1994), management (Worthy, 1996), social work (Ryan, Fook & Hawkins, 1995) and computer programming (Campbell, Brown & DiBello, 1992; Chmiel & Loui, 2004). The Dreyfus brothers' view and their model's approach to professional skills development considered professional practice as 'intersubjective, dynamic in nature and...pluralistic in character' (Dall'Alba & Sandberg, 2006). This was a sharp variation from the traditional and cognitive-based models that offered a simplistic and individually focused view of professional practice. We now briefly outline the Dreyfus and Dreyfus model and its contribution to professional development practice.

2.4 The Dreyfus and Dreyfus Skills Acquisition Model

The Dreyfus and Dreyfus model essentially identifies what the practitioner has achieved at each stage and what higher order skills he or she is then ready to undertake. The model proposes that a practitioner passes through five distinct stages: novice, competence, proficiency, expertise, and mastery, which in turn are based on four binary qualities, namely recollection, recognition, decision and awareness (Dreyfus & Dreyfus, 1980).

The *Novice* is the first of the five linear stages. It is here that the learner rigidly adheres to rules or plans taught in training. The underlying assumption is that the learner has little situational perception and no discretionary judgement. At the next level, the *Advance Beginner* is able to recognise some global characteristics of situations only after some prior experience (labelled as '*aspects*' in this model). Here, the learner is recognised for his or her limited situational perception and guidance for action for the set of prescribed attributes and aspects (treated as separate entities but given equal importance). Subsequently the learner progresses to the *Competent* stage where the learner has to cope with an increase in the number of attributes and aspects to be learned. Through conscious and deliberate planning on the part of the learner and performing standardised plus routinised procedures the he or she is supposed to see the actions taken at least partially in terms of longer-term goals. After that, the *Proficient* stage acknowledges the learner's ability to see situations holistically rather than in terms of *aspects* as well as is what is most important in a situation. This means that the learner is able to perceive deviations from the normal pattern and use maxims of guidance whose meanings vary according to the situation. The arrival to the second last stage of the model, establishes the learner as an *Expert* who no longer relies on rules, guidelines and maxims as he or she has an intuitive grasp of situations based on deep tacit understanding. The learner has then reached a milestone by developing a niche through applying analytical approaches to familiar or novel situations as well as envisioning what is possible in the unchartered territories of the profession. The final stage assumes absolute *Mastery* of the know-how, know-what, know-why of the profession (Dreyfus & Dreyfus, 1980).

2.5 Dreyfus and Dreyfus: The merits

The key strength of the Dreyfus and Dreyfus model claimed by Eraut (1994) is the recognition of *tacit knowledge* and *intuition*, which are acknowledged as important traits of professional expertise. *Tacit knowledge* was famously introduced in *The Tacit Dimension* by Michael Polanyi with the assertion that 'we can know more than we can tell' in 1966 (pg.4). It refers to knowledge consisting of *beliefs, ideals, values, schemata and mental models*, which are deeply ingrained in us and which we often take for granted. While difficult to articulate, this cognitive dimension of tacit knowledge shapes the way we perceive the world. Likewise, *intuition* or the ability to acquire knowledge without inference or reason allows one to use his/her base of experience to identify similar situations and intuitively choose feasible solutions. Generally, people are not consciously aware of their tacit knowledge and intuition but it is revealed through practice within particular contexts (Schmidt & Hunter, 1993).

The Dreyfus brothers (1986) argue that tacit knowledge and intuition that identify expertise are embedded in professional practice. This counters traditional cognitive explanations where sets of professional programme attributes are de-contextualised and 'consciously' re-formed into content for professional education delivery. As intuitive or tacitly skilled experts, then, these practitioners will exhibit a highly organised and sophisticated knowledge base that is able to be tapped into to view workplace problems in a systematically and highly principled way (Glaser & Chi, 1988). This gives importance and recognition to the expert 'know-how' and/or intuition as tacit, experiential and that which cannot be expressed (Polanyi, 1966).

Another significant strength of the Dreyfus and Dreyfus model is the linear 'step' progression that permits the practitioner to identity the set of attributes at each stage from novice to expert within a professional training framework. This creates the potential for the model to be a guide and a pathway to developing expertise (Kinchin & Cabot, 2010). Also, it permits an acceptable level for the assessment of competencies or capabilities at each stage, which in turn offers a means to support professional development through a structured training framework. For example, Benner (1984; 2004), adapted the Dreyfus model to define comparable stages in the development of clinical competencies that physicians have translated and adjusted to explain not only simple routine clinical skills but also clinical problem-solving skills through tacit knowledge and intuition (Pena, 2010; Carracciao et al, 2008). This permits training of physicians in practical wisdom that is experiential and 'understood' (Daalemann, 2008). With a structured guide and support for professional development through the identification of the set of attributes as well as appropriate forms of assessment at various stages of the Dreyfus and Dreyfus steps, Holmboe and Hawkins (2002), along with the Accreditation Council of Graduate Medical Education (2008), have recommended adopting the Dreyfus' ideas as a framework to understand medical competencies and proposed the model for curriculum planning for medical residency programmes.

In brief, the Dreyfus and Dreyfus model's efficacy is perceived as self-evident in its recognition of professional skills as more than a set of attributes to include also tacit knowledge and intuition which signal the arrival of the learner to the Mastery stage. Moreover, the linear characteristics of the model permit a step-by-step development of the workforce while providing a structured training framework to standardise and create benchmarks for *in situ* learning and assessment. These practice-based strengths have over time institutionalised the model as a largely unchallenged professional development paradigm that has received reverence and adoption within a range of health, education and other professions. Indeed the very metaphor of 'novice to expert' can be attributed to the Dreyfus brothers.

2.6 Dreyfus and Dreyfus: A critique

However, the Dreyfus and Dreyfus model's focus on mainly cognitive aspects of skills development, including the privileging of 'hidden' tacit knowledge and intuition, has neglected consideration of the vital impact of social and cultural contexts on professional education. The recognition of sets of practice-based attributes and tacit knowledge or intuition through the Dreyfus model, we contend, is insufficient to

account fully for the factors that make up a professional development experience. It is necessary, we believe, to address the practitioners' workplace experiences *as well as* the social, cultural and historical contexts of the novice to expert journey, which are largely neglected in the model. Other weaknesses, too, are suggested below.

For example, a significant limitation is the model's use as a linear step-by-step tool for charting the novice to expert pathway. It identifies the progressive stages from beginning to end but provides little insight into each stage in any depth. The novice to expert model was formed with the intention to assist in the design of training programmes and training materials to facilitate development of *higher order skills*. This is due the fact that the model relies on everyday familiarity where concrete experience plays a principal role; only experiences entrenched in concrete tasks allow for higher levels of performances and skilful behaviour (Dreyfus & Dreyfus, 1980). This reliance only skims the width of the model but eliminates the possibilities of understanding the phenomenon experienced by the learners in each stage, particularly through the significant influence of the social, cultural and historical contexts in the learning process, which suggest a more complex, reflexive and iterative process.

Another limitation of the model is the underlying assumption that a novice practitioner is one who starts with a clean slate and has no pre-existing sets of practice-based experiences, attributes or professional skills to pre-empt the successful performance of tasks within the training framework. Learning is not only adding new or assimilated knowledge to an existing base but also includes making meaningful connections and active interaction with acquired prior knowledge (Prawat, 1989). Indexing and tagging cognitive representations from previous problem solving in socially and culturally determined situations may transform into further cognitive structures and schemata that could shape the personal histories of practitioners and aid in future interpretations; for example, through prior learning, which provides a valuable link to recall cognitive structures to be deployed and acted upon in accordance with current social and cultural circumstances (Billett, 1996; Anderson, 1982, Ericsson & Simon, 1984; Brown, Collins, Duguid, 1989; Greeno, 1989; Pea, 1987, Lave, Murtaugh & de la Roche, 1984).

To further this argument, the same novice uses prior learning to execute current tasks and employs problem solving skills that are developed at micro levels over a period of time while engaged in socially and culturally determined activities (Rogoff, 1990). Routine problem solving skills are developed through repeated enactment of the tasks and stored as prior knowledge or learning. This enables the practitioner to utilise little conscious or effortful thinking to resolve issues (Billett, 1996). On the same note, non-routine problem solving skills which present novel issues require extensive conscious thinking as the variables are unknown and the practitioner searches his or her existing cognitive schemata in the form of prior learning (similar situations in the past) to establish a basis for decision making which may require access to conceptual understanding and higher procedures (Billett, 1996, 2001). With repeated performance of this non-routinised problem solving skills over a period of time in socially and culturally determined circumstances, it too will be added to the existing knowledge base, making connections and interactions with prior knowledge for future recall, deployment and enactment (Prawat, 1989). For this reason, the

suggestion that a learner starts at ground zero with no prior experience negates the historical contexts in the learning process.

On the same note, individuals at each stage use to varying degrees prior knowledge and problem-solving skills. Their dispositions, too, affect their learning in the same way. Practitioners have attitudes, values, interests and identities (Prawat, 1989) that influence the importance of a particular activity within each stage and determine whether they are willing to engage actively to secure intended knowledge (Billett, 1996). In their study, Dweck & Elliot (2983) have noted that some individuals who participated in an activity for reasons other than wanting to gain knowledge were inclined towards wanting to secure the identity of 'looking smart'. This individual tendency influences the capabilities that are put into action and determines what each will learn from an activity (Perkins et. al, 1993a, 1993b; Dweck & Elliot, 1983). To learn or not to learn; the extent to which learning takes place is then dependent on an individual's disposition and becomes an innate quality influencing the development of cognitive structures such as schemata acquisition and its deployment (Grusec & Goodnow, 1994) which might not reflect their true accomplishments for an individual who has completed the tasks designed for each stage. There might be some signs in behaviour demonstrating limited acquisition of professional skills but the extent to which the learning took place, the securing of the knowledge and its appropriate use in subsequent stages in the form of prior learning or problem solving skills can only be determined when the individual is tasked to perform in socially and culturally determined contexts. Consequently, identifying the learner as a 'blank slate' at the commencement of a professional development activity eradicates such contexts within the learning process.

This brings us to the foremost criticism of the Dreyfus and Dreyfus model: its failure to include a notion of 'embodied understanding' or the idea that the novice's journey of professional development always takes place within a specific workplace context, including interaction with other individuals and groups. This, then, takes the model beyond one emphasising individual cognitive attributes of the novice to expert journey to one that considers the social and cultural, including individual biography, within specific historical narratives.

As individuals with varying degrees of prior learning and problem-solving skills engage in each stage of the novice to expert journey, their learning gains are influenced by their interaction with the context of the professional practice environment. Professional practice does not alone include sets of attributes but also constitutes an embodied understanding of practice in a given profession which shapes and organises their knowledge and skills into a particular form of professional skill which when understood in certain ways will be developed in that way (Dall'Alba & Sandberg, 1996, Sandberg, 1994, 2000, 2001; Sandberg & Pinnington, 2006). This can be exemplified in the teaching profession where for example 'teaching' can be understood as either as 'transfer of knowledge' or 'facilitation of learning'. Either will determine the embodied understanding of the teaching practice, that is, either to improve on how to present the facts and figures through effective presentation and communication skills or developing skills to monitor plus enhance the learning of the students respectively (Dall'Alba & Sandberg, 2006). In this sense, the embodied understanding of professional practice

is then not removed but embedded in the teaching context which includes both the individual and collective engagement between the teacher and learners, the organisation's social and cultural context as well as engagement with other staff members that have both individually and collectively embodied understanding.

To further illustrate this, Dall'Alba and Sandberg (2006) interviewed thirteen medical students where Max and Ingrid, who are both novices, were identified for distinct differences in their embodied understanding of professional medical practice and approach to patient care. Max used the health care system as a reference point to match the patients' symptoms against possible treatments and to inform when none was available. However, Ingrid took the patients' wider life situation, which included their hopes, and pushed to heal as the reference point and looked for treatments that worked for patients. The vast difference in their embodied understanding of medical practice within a specific stage in the novice to expert model continued to be influenced by the medical practice context through 'movement outward and in unexpected directions; questioning of authority, criticism, innovation, initiation of change, instability and inner contradictions of practice' (Engestrom & Miettinen, 1999, p.12). This context formed the background of encountering patients, the health care system and its role in citizen healthcare which in turn provided a real world context for Max and Ingrid to interpret and develop their embodied understanding of medical practice, that is, what did it refer and belong to (Dall'Alba & Sandberg, 2006). By the end of the programme, both Max and Ingrid's delimited embodied understanding evolved into a richer and nuanced understanding of medical practice and informed categorised understanding of medical practice.

Equally, Benner (1984) and Borko et al. (1997, 2000) argue that professional development is linked not only to the development of knowledge and skills but includes learning how to deal with the situations encountered in descriptively different and more skilled ways as the social environment provides a form of negotiation which draws upon social and cultural contributions in the form of clues and cues that are particularly useful as engagement with and in these authentic activities (Brown et al, 1989; Billet, 1993a, 1993b, 1994, 1995b; Collins, Brown & Newman, 1989). To reiterate this position, Billett (1996) and Savickas (2001) affirm that within the framework of personal and organisational preferences and goals, each practitioner gains some form of stability through acclimatising to the organisation's culture and performing adequately on the job. This means that Max and Ingrid's earlier exemplification of limited embodied understanding of medical practice at the beginning of their scholarship and their active engagement in the medical context over time not only evolved into a more finessed embodied understanding of medical practice while professionally developing their living knowledge and skills base but also changed them into 'being' and 'existing' as medical practitioners who in turn broadly defined the healthcare system and the treatment that their patients received (Dall'Alba & Sandberg, 2006).

To this end, the argument of the limitations of the Dreyfus and Dreyfus model comes full circle as it further strengthens the connections to the earlier discussion of the model's shortcomings of being a step progression and the notion of a true novice who is lacking prior experience. First, consistent with the notion of professional skills being developed within an embedded professional practice in socially and culturally

determined activities, the idea of learning in a stepped progression needs to be re-examined as it delimits and excludes the ideas posited above as well as nullifies the 'relationship between the practitioner (with a particular history located in and broader practice contexts) and professional practice which is dynamic, inter-subjective and pluralistic' (Dall'Alba & Sandberg, 2006). Second, no novice is a true novice in the literal sense of the word as every practitioner brings to the task a part of themselves in the form of personal history - their embodiment of knowledge, skills, experiences, understanding, dispositions and an extensive living knowledge base. The degree of success within each stage is determined not solely by the enactment of the required set of attributes or professional skills through the right behaviour but is dependent on the numerous variations and depth of each embodiment which can be combined to perform successfully. This means that their previous understanding is replicated in each new situation and this new platform allows them to interpret their previous understanding into new experiences, analogous to Dewey's (1938) 'continuity of experience which emphasises that:

> every experience enacted and undergone modifies the one who acts and undergoes while the modification affect the quality of subsequent experience…which means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after (Dewey, 1934, p. 26-27).

This can be exemplified in Michael Huberman's (1989) study of teachers' professional life cycles which confirmed an array of professional developmental pathways where a fixed sequence was improbable. Also, it challenges the fixed sequences of Dreyfus' model as further illustrated in Jane Rubin's (1996) study of professional nurses with more than five years of nursing experience who were supposedly beyond the earlier stages of the Dreyfus model but yet to achieve 'Expert' status. Although the nurses were able to focus on symptoms indicating the patients' physical condition, they 'lacked knowledge of the qualitative distinctions that embodied in expert nursing practice (Rubin, 1996, p. 191). Implicit in Rubin's analysis is the notion that even if they may have crossed the early stages of professional development and are technically competent above the novice's level, their understanding of nursing practice was delimited to that of a junior. In this case, the arrival into and departure from one stage to another is obscure and there may be opportunities to leapfrog stages or afford occupying separate stages at the same time. The lack of focus on how professional understanding is developed creates a fundamental flaw of assuming a beginning and an end to each stage in the Dreyfus model.

2.7 Summary

Through understanding the nature of learning and the journey of the novice to expert, we can affirm that the Dreyfus and Dreyfus model seeks to highlight the stages more so than the depth of each phase of development, thereby creating a challenge in focussing on the know-how regardless of the practice concerned. The Dreyfus model at each stage supposes common rules for a wide range of scenarios that are outwardly similar and neglects the wide scope of possible richness and

nuances of the situations within each stage giving rise to the eradication of the concept of learning and professional development as an iterative process ensuring further finessing of existing know-how that progresses to a multi-faceted, all-encompassing development of skills at more complex and comprehensive levels (Dall'Alba & Sandberg, 2006).

To shift away from the traditional focus of learning and stepped progression that curtails the development of 'know-how' that is inclusive of embodied understanding, dispositions, problem-solving, prior learning as well as the social and cultural dimensions of the context and the encompassing nature of each individual's historical biographies, we need to focus on the need to deal with professional ways of 'being' and 'existing' within a framework that allows us to deal with the complex, ambiguous and dynamic nature embedded in professional practice (Dall'Alba & Sandberg, 2006). The iterative process of 'know-what' and 'know-how' merits careful consideration within a re-reading of the Dreyfus and Dreyfus model. The nature of professional development over time within a particular vocation according to this new focus will then have significant implications for both practice and the research that informs future practice. It is to these implications through the lens of the gathered data that we now turn.

3.0 What We Found

3.1 Introduction

This chapter brings together key issues raised in the literature review with the collected interview data. While having the overall goal of testing the veracity of the Dreyfus and Dreyfus (1980, 1986) professional development model as a vehicle to account for the continued growth (or not) of DACE learners as curriculum development designers and learning facilitators, the chapter goes a step further and embraces the points made by critics of Dreyfus and Dreyfus. This, it is hoped, will further the utility of the model when considering all forms of professional development within multiple workplace contexts.

Fundamentally we recognise the value of the Dreyfus and Dreyfus model as a heuristic device to account for the progression of DACE learners from 'novices' to 'experts'. That is, it is a useful metaphor or shorthand means of outlining the journey of the professional DACE educator. However, we expand the explanatory value of the model by including the following. First, though we acknowledge the 'stages' outlined by the model we also recognise that progression through the Novice-Advanced Beginner-Competent-Proficient-Expert framework is rarely clearcut. Arrival and departure from one stage to another is often opaque, including leapfrogging stages or occupying separate stages at the same time, depending on the contexts in which skills are being developed. That is, the model cannot be assumed to be unilinear or non-iterative. The categories, too, are rarely absolute and overlap or merge in situated workplaces. Second, and as a corollary, we point out a fundamental flaw in the model that it is assumed to have a 'beginning' and an end' as a novice-expert continuum. Individuals and groups more often than not bring relevant life-skills and 'practical wisdom' to professional development that challenges the idea that they are truly naive novitiates. At the other extreme, experienced professionals are similarly loathe to claim that they are absolute 'experts' as there are always new challenges to face and skills to acquire. As such, the playing out of the model should be considered, as suggested, cyclical and iterative rather than linear and procedural. Third, we expand the model's assumption that learning through the stages is an individual cognitive project devoid of context. We do this through recognising that all learning takes place in a socio-culturally informed environment and as such individual cognition has external real world reference points. In recognition of this connection between individual learning and its socio-cultural context we make use of the concept of 'embodied understanding' as an explanatory tool of this interactive process which also includes the capacity of individuals and groups to shape the multiple environments with which they interact. This is often referred to as 'agency'.

We explore these issues within the dominant themes that have emerged from an analysis of the project interview data. They are revealed and discussed within a

series of headings that approximately reflect the 'stage' categories of the Dreyfus and Dreyfus model. First, we examine the DACE learners' prior learning and life experiences and how these have shaped their entry to the programme as 'novices'. Second, we gather together their thoughts about DACE, including reflections on their 'novice to expert' journey. Third, we consider the learners' ideas on their newly acquired or further developed curriculum design and learning facilitation skills and how they have in turn impacted their capacity to influence change in the CET sector.[1]

3.2 DACE Learners' Prior Experience

The interview cohort consisted of mature age workers with well established professional careers before entering the DACE programme. They came from a variety of industries including education, hospitality, engineering and commerce. Learners tended to make use of the areas as resources for building 'practical wisdom' in the CET field as Subject Matter Experts (SMEs). These also often constituted their main domain knowledge or content teaching areas. Most of the interview cohort members, too, were well-established trainers with experience ranging from two to eighteen years, though most fell within the two to four year range. Gender numbers slightly favoured males, with females strongly represented in the group and across the DACE programme. Most learners had completed ACTA before enrolling in DACE though there is no prerequisite to do so. This dual participation enabled interesting comparisons to be made between the ACTA and DACE courses. Most in the interview group indicated a preference to enrol in DACE to improve their facilitation and lesson planning skills rather than for curriculum development and writing skills. As such, most avoided the curriculum writing elective, at least in the initial programme intakes. Later intakes were required to engage with the module as it became compulsory. The selected members of the interview group were considered typical and representative of the DACE programme cohort.

'If you come in and just do it [DACE], you will find it very, very difficult. It's going to be really difficult for you because a lot will be imagination and all that and then you may end up as being one of the casualties...going through the whole system and studying it like a book, not applying it correctly, and you know, not making sure things are done correctly.' (Learner)

The division of the interview cohort into those who were interviewed in 2010-2011 (n=10) and those interviewed in 2012 (n=10) provided an opportunity to compare the impact of the programme on learners over time. While many ideas were held in common there were strong indications that the programme's effects on learners shifted, demonstrating a change in its effectiveness on influencing learners' pre-DACE learning facilitation and curriculum-making perceptions. The first cohort tended to hold 'compliant' (Bound, Rushbrook and Sivalingam, 2013) assumptions about curriculum and learning facilitation which were most likely acquired before

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[1] In order to keep the report to an economical length we have avoided using extensive respondent quotes but have used instead breakout boxes as illustrative examples.

embarking on the DACE programme. The second cohort, however, tended to be more 'interpretive' in its approach, indicating a shift in perception through participation in the programme (Bound, Rushbrook and Sivalingam, 2013). In other words, the first cohort tended to be less questioning of the CET system's regime of curriculum construction and learning facilitation and adopted a technocratic, unproblematised approach to curriculum writing and delivery. On the other hand, the second group tended to adopt, but not exclusively, an interpretive stance that constructively challenged existing curriculum-making and learning facilitation practices with innovative alternatives based largely on the content of the DACE programme and the practice-based role-modelling of DACE facilitators. How these differences have manifested over time may be an indicator of the growing reputation and effectiveness of DACE and a maturing of the CET sector (Willmott & Karmel, 2010).

Learners acknowledged that prior non-adult education content knowledge was essential to inform the facilitation and curriculum skills developed within the 'discipline free' DACE programme. However, they disagreed as to whether or not prior facilitation and curriculum experience was necessary before commencing DACE. Some claimed prior experience was indeed essential because of the relative complexity of concepts and skills covered in relation to learning facilitation and curriculum writing. Most of these, too, believed that ACTA was an appropriate stepping stone as it covered learning facilitation and curriculum-writing 'basics'. Others, however, believed that beginning fresh as a 'blank slate' without prior knowledge did not cloud their minds with thoughts about adult education that may have been ill-informed and prejudicial to acquiring the innovative thinking and approached perceived to be characteristic of DACE. If so the 'unlearning' process may have been challenging. The numbers interviewed favoured the 'prior learning facilitation and curriculum writing experience' approach, though significant numbers supported the 'blank slate' approach.

It is these tensions between the learners' prior experiences brought to DACE and the skills, knowledge and attitudes gained through the programme that challenge some of the key assumptions of the Dreyfus and Dreyfus model. Clearly, the learners interviewed come to DACE as more than novices, for which the model does not adequately account. This emphasises strongly the effects of contextualised prior knowledge and experience, or 'practical wisdom' on what learners actually gain from DACE participation; learners were able to compare, interrogate and reflect on these experiences in relation to DACE's novel ideas. The programme, therefore, either challenged or supported earlier experiences and potentially introduced valuable change-oriented curriculum and learning facilitation strategies. And, given the iterative nature of reflection between developing new skills and past practice, the process is clearly non-linear or stage-dependent, as suggested by the model.

3.3 Reflections on the DACE Programme: The journey from novice to expert

This section of the report demonstrates, we believe, that the journey from novice to expert should be considered as a metaphor only and not, as we have stated, a literal

linear journey from a lower to a higher point on a novice-expert continuum. We do share the belief, however, that there is a journey of sorts but the process tends to be 'one step forward, two steps back', with frequent reflective pauses at any one or more points. In addition, such movements tend to be informed iteratively not only by individual reflection but also through participation in collective learning activities approximating Lave and Wenger's 'Communities of Practice' (1991). Learning, too, takes place in specific contexts that shape the value and meaning attributed to the practice environments in which it occurs. This is what we mean by 'embodied understanding', which moves beyond Dreyfus and Dreyfus's essentially individual and cognitive approach. The following insights from the interviews tease out some of these reflections.

Clearly, the interview cohort gained much from the DACE programme's perceived sophisticated approach to adult education. Learners who completed both the ACTA and DACE programmes, believed that the DACE programme was of a 'higher order' in relation to conceptual rigour and sophistication, expanded content and broad-based and innovative facilitation skills. The ACTA programme was considered a useful introduction to adult education and the skills of learning facilitation and curriculum-making. However it was regarded only as the 'how' of adult education; in addition, DACE also answered 'why'.

As a way of following up perceptions of the value of DACE in shaping their transformative learning journeys, learners were asked to nominate the modules that most influenced their thinking. The majority listed *Develop Practice through Reflection* as particularly important. For many reflecting 'in-practice' and 'on-practice' was a personally groundbreaking strategy of using facilitation and curriculum-making experience as a source of learning and knowledge to further develop professional capacity. Moreover, DACE learners also re-contextualised the reflective skills gained through the module within their own teaching and learning environments. They reported that their learners, too, gained much insight into their own workplace practices through the reflective process. More than any other knowledge and skill set gained within the DACE programme, learners considered reflective practice as a significant lifelong learning strategy that would transcend their study experience.

> *'Definitely I will not treat myself as an expert because I want to learn, because I have to empty my jar. If I treat myself as an expert, I will not be able to learn anything.' (Learner)*

Interestingly, within the DACE programme, learners considered that they developed their reflective practice and learning facilitation and curriculum-making skills not only through the content of individual modules but also through the powerful influence of facilitator modelling. Many learners entered the programme expressing scepticism in relation to exposure to facilitative learning practices but were soon convinced once they, too, developed and modelled, good practice within their own learning spaces, reporting an increase in positive learner and training organisation feedback. Though particular DACE facilitators were identified as exemplary role models, there was consensus that the more-or-less uniform approach of all facilitators contributed to their educational sea change to embrace genuinely and make clear a distinction

between previous roles as 'trainers' and their new positioning as 'facilitators'. Included in this too, was the semantic shift from working with 'students' or 'trainees' to 'learners'. This transformative leap, though not as evident in the earlier interviewed cohort, was still evident in their willingness to at least explore the idea of shifting from 'stand and deliver' pedagogical approaches to those privileging the learner both as an individual and as part of a group. As such there was evidence of all DACE learners taking up pedagogies emphasising self-directed learning, group work and reflective practice, among others.

In addition to learning from course content and facilitator role models many interviewees indicated the importance of classroom and workplace peer support. Given the relative novelty of many of the DACE programme's ideas and potential challenge to previous teaching and learning practices it was felt that this support enabled the acquisition, internalisation and practice of new approaches to learning. For those fortunate enough to be participating in the programme with workplace colleagues peer support had a double advantage, enabling the development of ideas within the classroom and then practising them in actual workplace contexts. Some learners even indicated they would not have completed the programme without this support.

Most DACE learners indicated that they were participating in the programme to develop further their facilitation rather than curriculum-making skills. There was a general perception that curriculum design was poorly paid and not as personally fulfilling as interacting in learning spaces. Given that most learners labelled themselves as 'freelancer-trainers', they believed that the best opportunities presented for ongoing employment were, then, in learning facilitation. Very few indicated an interest in combining the skills of curriculum design and learning facilitation, suggesting an acceptance of current CET sector practice that tends to separate the two roles. This also implies an interest in DACE beyond the programme as a means to practice superior adult education skills to one which simultaneously recognises the relative value of the qualification within the education marketplace. As such DACE for learners also became a 'positional good' that gives competitive employment advantage within the tough CET sector. There was mixed evidence, however, in relation to how the DACE qualification was received in the marketplace as an indicator of superior educational practice. Some employers valued it because of the perceived quality of DACE learners and graduates, while others simply wanted a trainer who could be employed to deliver the nominated programme as written. This suggests differences in employer perceptions and expectations of learning facilitators in adult education workplaces.

Overall, while learners confidently expressed the idea that they were learning new skills and acquiring knowledge that led them beyond their pre-DACE adult education experiences, they were loathe to identify as 'experts', expressing a belief that to do so may lead to complacency and a consequent reluctance to further their professional skill development. In this sense, most learners recognised that to seek expertise in learning facilitation and curriculum-making was desirable but better to engage with as an unachievable lifelong process, or a journey without end. A few learners, though, believed that 'true' expertise could be achieved through advanced

study that incorporated research. Some of these have taken up this strategy and enrolled in Masters of Education programmes.

3.4 DACE Learner Agency and the CET sector

From the evidence gathered and presented it appears that there has been a qualitative shift in DACE graduates even within the short space of material gathered from the two different interview cohorts (2010-11 to late 2012). While the first group could be considered as more 'compliant' in their assumptions about adult learning facilitation and curriculum-making, the second demonstrates clearly a developing capacity to be more 'interpretive' or agential in their workplace practice and reflections on Singapore adult education. In many ways the second cohort is well on the way to fulfilling the dream of a former WDA senior manager who imagined in a DACE adult educator:

> somebody who is a reflective practitioner, a person who had a broader educational background, an educational set of understandings and somebody who is adjusted. Many of the ACTA trained may not have an area of specialisation...and there is some total understanding of education, training and learning – they were not educators; they were just very narrow trainers. So the idea was to create more of an educator, somebody who could have a discussion about the different approaches to assessment, who if wanted could talk curriculum...The idea is not to have a conformist but people who will have critical perspectives. There should be a bit of reading...I would like to have it run as a good academic programme; for example various approaches to ID [Instructional Design – ed.], concept of ID, critics of ID, transform these people so they are not the same when they come out as when they went in (interview, April 2012).

Even though the DACE programme is currently under review, it is likely this trend to increased DACE graduate agency will continue given the maintenance of the programme's original values, courseware and outcomes.

It is, however, in the workplace, interviewees reported, that tensions have arisen that present some interesting challenges to the CET sector and to DACE course writers and managers. Current employment arrangements within the sector are generally based on a small core of ongoing staff supported by a larger group of freelance adult educators who work for fixed periods, generally part-time across multiple employers. Though there are exceptions most training organisations have an expectation that freelancers will enter the organisation and deliver course content according to courseware approved by WDA's Quality Assurance Division (QAD). This often requires the adult educator to present vast series of PowerPoint slides and related information in pre-prepared course booklets in order and without missing any one slide and its associated courseware. Though this was not the intention of the

'I'll always customise it and I'll always contextualise it...In fact, the auditor had a good half hour with me and asked me why. I realised [I was] not doing exactly what they were saying and I'm able to substantiate that it doesn't make sense and they say, 'Okay'. I said, 'Don't you realise this is not working?' (Learner)

QAD process, current practice assumes that total compliance is the norm. As such DACE graduates armed with learning facilitation skills that privilege learners and their needs which may require courseware modification and timing within the stated WSQ competencies have expressed difficulty in practising their hard-won DACE skills. While some expressed that being 'law-abiding Singapore citizens' in their learning spaces was a way to deal with this frustration, others actively sought to influence change within the training organisation's management of the WSQ framework, with mixed success. The best responses from training organisations were those in which learners reported increased satisfaction from DACE-trained adult educators over those with lesser or no qualifications. Other, organisations, too, felt confidence in their DACE adult educators and permitted 'managed flexibility' in delivering programmes. These organisations tended to be those who had sent staff along for DACE training and over time saw the educational and market benefits of the programme.

This playing out of DACE learners and graduates and their newly acquired or reinforced knowledge and skills within workplaces once again suggests the contextualised nature of expertise and practice and how it is contingent on the value accorded it by the environments in which it is enacted. As such, there is no 'objective' standard of novitiate or expert work as implied by the Dreyfus and Dreyfus model, but only that which is valued or labelled as such by participating individuals and organisations. This suggests, then, that the value of DACE as a programme for adult educators can only be measured in terms of the aspirations held for it by the organisations which employ DACE learners and graduates. As such, as DACE is increasingly recognised and supported by the CET sector, whether through the growing reputation and quality of graduates or through CET providers' future mandated status (post-2015) to include on staff a DACE qualified curriculum designer, it is likely to gain increased purchase in the sector.

3.5 Summary

This chapter has summarised the evidence collected through semi-structured interviews with 20 DACE learners representative of the DACE cohorts from 2011-2012. The evidence was presented in an order that approximates the Dreyfus and Dreyfus journey from novice to expert. It has been argued that the model's *novice* stage undervalues the contextualised prior knowledge that DACE learners bring and contribute to the programme. This insight accords with Dall'Alba and Sandberg's findings that embodied prior learning contributes to programme understanding disproportionately to the actual content of the programme itself, in part accounting for the Dreyfus and Dreyfus model's failure to account for differential rates of learners once they enter a programme of professional development. In the middle stages of the model – the movement through the *advanced beginner*, *competent* and *proficient* stages – the evidence suggests clearly that professional development is rarely linear with students progressing iteratively at differential rates within a range of knowledge and skills sets. The course material explored, too, tends to be valued contextually by participants and the workplace according to its personal and enterprise value, and not as an objective or fixed 'container' of skills. The final *expert* stage also has yielded some interesting outcomes with learners expressing reluctance to be labelled

as such due to a belief that expertise is a never ending journey and to assume self-belief would be to deny further development. CET employers appear to have two separate responses to perceived increases of expertise in their DACE-educated facilitators. The first is to deny facilitators an opportunity to practise their new professional knowledge through enforcing rigid adherence to existing programme courseware. The second, generally based on knowledge of the DACE programme and its possibilities for training innovation, permits DACE-trained facilitators increased opportunities to practise flexibly their skills within stated WSQ outcomes. This is often based on noted improvements in learner responses to teaching programmes and the quality of their facilitators.

4.0 Conclusion and Recommendations

4.1 Introduction

The research for this report is the second stage of the *WSQ Diploma in Adult and Continuing Education: Curriculum and quality courseware designers* project (The DACE project). The two stages investigated issues related to the effectiveness of DACE graduates in designing, implementing and facilitating quality WSQ curricula, and also traced their professional development journey before, during and after participation in the DACE programme. The aim of this two-pronged approach was to assess the readiness of DACE learners for their roles post-2015 as mandated ATO curriculum designers, which requires providers to employ at least one DACE graduate to manage the development and implementation of WSQ-related programmes.

The evidence from the first stage of the project suggested that DACE graduates tended to be 'compliant' rather than 'interpretive' curriculum designers, meaning in effect that they lacked the capacities demanded of an innovative, reflective and capable educator, a key DACE programme expectation. This finding suggested to us that DACE graduates might not be ready for their post-2015 role. Though initially disappointing, this conclusion was soon challenged by the second stage of the project which suggested that in their journey from novice to expert, DACE graduates are increasingly demonstrating through workplace practice that they possess emergent skills as competent and skilled curriculum designers and learning facilitators able to respond innovatively and knowledgably to the new expectations placed on them. This noticeable shift in perception between the 2010-2011 and 2012-2013 interview cohorts was most likely due to the rapid maturing of the DACE programme over this brief period, including wider acceptance by industry of the new graduate skill sets. It was perhaps also of value to ATOs that these novel approaches produced a further 'bottom-line' effect of increased demand for DACE educators. Though not all DACE graduates exhibit these new attributes, the research suggests a strong trend in this direction.

In the following we summarise the key findings of the report in relation to curriculum design and learning facilitation and make appropriate recommendations and suggestions for future consideration in revisions to the existing DACE programme, including its construction and delivery. We consider first some of the implications of using the Dreyfus model as a theoretical and practice-based guide to professional development and follow this with some of the insights for learning facilitators and CET managers and employers gained from the interview data.

4.2 Key Findings and Recommendations

4.2.1 Curriculum Designers

The project literature review assessed the 'novice to expert' model developed by the Dreyfus brothers in the late 1970s. The model was considered in detail because of its seminal status in the field and continuing influence well into the New Millennium. While we acknowledge the value of the Dreyfus and Dreyfus's idea that professionals work their way from less to more expertise through a continuum that at various points may be labelled as stages, we agree with Dall'Alba and Sandberg that these 'stages' are rarely unilinear or focused inwardly on individual cognitive issues alone. We make use of their reading of 'embodied understanding' which suggests that professional learning occurs within specific learning environments that extend beyond individual cognition to include dialectical interplay with workplaces and other socio-cultural contexts. Within these contexts the individual may also bring to learning prior biographical experience and knowledge. The manner in which these socio-cultural attributes relate iteratively within the novice to expert journey, then, becomes profoundly multi-directional and complex. Though Dreyfus and Dreyfus acknowledge these issues we support the critical literature that suggests the processes involved are insufficiently interrogated. We also agree with Dall'Alba and Sandberg that this process of journey and increased professional understanding and practice accords closely with Giddens' ideas related to individual agency within interactive contexts: 'practice is constituted neither by an objective structure constraining professionals' action nor by the professionals' subjectivity, as sometimes claimed. Rather, practice is intersubjectively constituted through mutual understanding of a specific institutionalised order enacted by individuals' (Dall'Alba and Sandberg, 2006, p. 385).

Recommendation One. We suggest that curriculum designers in programmes such as DACE, when considering using the Dreyfus and Dreyfus stage model of professional development, and indeed any related model that offers a linear and simplistic developmental process, do so with caution, taking note that learners bring with them prior knowledge and workplace practices that add complexity to any described 'stages'. For example, learners are rarely 'novices' in the true sense of the word as most are adults with considerable experience in their fields of expertise. As such programme design should include activities to draw out and use these experiences or 'embodied understandings' at all stages of the programme design through such strategies as reflective practice and action learning.

In addition to learning from course content and facilitator role models many interviewees indicated the importance of classroom and workplace peer support. Given the relative novelty of many of the DACE programme's ideas and potential challenge to previous teaching and learning practices it was felt that this support enabled the acquisition, internalisation and practice of new approaches to learning. For those fortunate enough to be participating in the programme with workplace colleagues peer support had a double advantage, enabling the development of ideas within the classroom and then practising them in actual workplace contexts. Some

learners even indicated they would not have completed the programme without this support.

Recommendation Two. We suggest that DACE course designers build into any future programme revisions activities that acknowledge and make use of mutually supporting classroom peer groups. The support could also be extended to possible activities and assessment outside the classroom, particularly when groups participate as members from the same organisation.

4.2.2 Learning Facilitators

Within the DACE programme, learners considered that they developed their reflective practice and learning facilitation and curriculum-making skills not only through the content of individual modules but also through the powerful influence of facilitator modelling. Many learners entered the programme expressing scepticism in relation to exposure to facilitative learning practices but were soon convinced once they, too, developed and modelled, good practice within their own learning spaces, reporting an increase in positive learner and training organisation feedback. Though particular DACE facilitators were identified as exemplary role models, there was consensus that the more-or-less uniform approach of all facilitators contributed to their educational sea change to embrace genuinely and make clear a distinction between previous roles as 'trainers' and their new positioning as 'facilitators'. Included in this, too, was the semantic shift from working with 'students' or 'trainees' to 'learners'. This transformative leap, though not as evident in the earlier interviewed cohort, was still evident in their willingness to at least explore the idea of shifting from 'stand and deliver' pedagogical approaches to those privileging the learner both as an individual and as part of a group. As such there was evidence of all DACE learners taking up pedagogies emphasising self-directed learning, group work and reflective practice, among others.

Recommendation Three. We suggest that DACE course designers continue to include a range of activities that model adult education facilitation and assessment best practice.

Recommendation Four. We suggest that learning facilitators remain aware of the powerful influence they have as practice-based role models to their learners and seek opportunities wherever possible to maintain and extend their educational expertise through formal and informal professional development.

4.2.3 CET Managers and Employers

Most DACE learners indicated that they were participating in the programme to develop further their facilitation rather than curriculum-making skills. There was a general perception that curriculum design was poorly paid and not as personally fulfilling as interacting in learning spaces. Given that most learners labelled themselves as 'freelancer-trainers' they believed that the best opportunities presented for ongoing employment were, then, in learning facilitation. Very few indicated an interest in combining the skills of curriculum design and learning facilitation, suggesting an acceptance of current CET sector practice that tends to separate the two roles. This also implies an interest in DACE beyond the programme

as a means to practice superior adult education skills to one which simultaneously recognises the relative value of the qualification within the education marketplace.

Recommendation Five. We suggest that CET managers and employers assist in raising the workplace status of curriculum designers through offering better remuneration for course development projects. Until this occurs there is likely to be a shortage of applicants for positions in the post-2015 training environment, which requires all ATOs to employ a designer as part of their legal obligation to WSQ curriculum quality assurance processes.

A number of DACE graduates and learners actively sought to influence curriculum practice change within their training organisation's management of the WSQ framework, with mixed success. The best responses from training organisations were those in which learners reported increased satisfaction from DACE-trained adult educators over those with lesser or no qualifications. Other, organisations, too, felt confidence in their DACE adult educators and permitted 'managed flexibility' in delivering programmes. These organisations tended to be those who had sent staff along for DACE training and over time saw the educational and market benefits of the programme.

Recommendation Six. We suggest that CET managers and employers acknowledge the additional professional skills of DACE graduates and permit greater degrees of latitude in interpreting the curriculum for delivery within stated WSQ programme outcomes.

4.3 Conclusion

This project has examined the issues and processes surrounding the DACE graduate 'becoming' an adult educator in Singapore, including skills in curriculum design and learning facilitation. While we attempted to privilege curriculum development over learning facilitation with a view to assessing the capabilities of designers in the post-2015 environment, the direction of the research suggests that the 'typical' DACE graduate considers curriculum design as an adjunct to a primary role as a skilled and professional adult learning facilitator. It appears that until the status and remuneration of curriculum design is raised to that of learning facilitation it may be difficult for ATOs to meet their obligations in this area. We see this as a challenge requiring attention in the immediate future.

References

Accrediation Council for Graduate Medical Education. (2008, September 21). Retrieved 01 01, 2012, from Outcome Project: http://www.acgme.org/Outcome

Anderson, J. R. (1982). Acquisition of Cognitive Skill. *Psychological Review , 89* (4), 369-406.

Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In L. Darling-Hammond, & G. Sykes, *Teaching as the learning profession: Handbook pf policy and practice* (pp. 3-32). San Francisco: Jossey-Bass.

Batalden, P., Leach, D., Swing, S., Dreyfus, H., & Dreyfus, S. (2002). General competencies and accreditation in graduate medical education. *Health Affairs , 21*, 103-111.

Benner, P. (2004). Designing formal classification systems to better articulate knowledge, skills, and meanings in nursing practice. *American Journal of Critical Care , 13* (5), 426-430.

Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice.* San Francisco : Addison-Wesley.

Benner, P., Tanner, C. A., & Chesla, C. A. (1996). *Expertise in nursing practice: Caring, clinical judgment and ethics.* New York: Springer.

Berliner, D. (1994). Expertise: The wonder of exemplary performance. In J. Mangieri, & C. Block, *Creating powerful thinking in teachers and students: Diverse perspectives* (pp. 161-186). Fort Worth, TX: Harcourt Brace College.

Billet, S. (1993). Authencity and a Culture of Practice. *Australian and New Zealand Journal of Vocational Education and Research , 2* (1), 1-29.

Billet, S. (1996). Situated Learning: Bridging sociocultural and cognitive theorising. *Learning and instruction , 6* (3), 263-280.

Billett, S. (2001). Knowing in practice: Reconceptualising vocational expertise. *Learning and Instruction , 11*, 431-452.

Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berliner, & R. C. Calfee, *Handbook of educational psychology* (pp. 673-908). New York: Simon & Shuster Macmillan.

Bound, H., Rushbrook, P., & Sivalingam, M. (2013). *What is curriculum?* Singapore: Institute for Adult Learning.

Brown, J. S., Collings, A., & Duguid, P. (1989). Situated Cognition and the Culture of Learning. *Educational Researcher , 18* (1), 32-34.

Campbell, R. L., Brown, N. R., & DiBello, L. A. (1992). The programmer's burden: Developing expertise in programming. In R. R. Hoffman, *The psychology of expertise: Cognitive research and empirical AI* (pp. 269-294). New York: Springer-Verlag.

Carraccio, C. L., Benson, B. J., Nixon, L. J., & Derstine, P. L. (2008). From the educational bench to the clinical bedside: translating the Dreyfus developmental model to the learning of clinical skills. *Academy Medical , 83*, 761-767.

Chase, S. (2005). Narrative inquiry: multiples lenses, approaches, voices. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (Third ed.). London: Sage.

Chi, M. T., Glaser, R. E., & Farr, M. J. (1988). *The nature of expertise.* Lawrence Erlbaum Associates Inc.

Chmiel, R., & Loui, M. C. (2004). Debugging: From novice to expert. *35th Symposium on Computer Science Education.* Norfolk, Virginia.

Clayton, J. (2009). Desert schools: An investigation of English language and literacy amoung young aboriginal people in seven communities. *Queensland Journal of Educational Research , 15* (1), 101-112.

Coffee, A., & Atkinson, P. (1996). *Making sense of qualitative data analysis: complementary strategies.* Thousand Oaks: Sage.

Collins, A., Brown, J. S., & Newman, S. E. Cognitive Apprenticeship: Teaching the Crafts of Reading, Writing and Mathematics. In L. B. Resnick, *Knowing, Learning and Instruction, Essayss in honour of Robert Glaser* (pp. 453-494). Hillsdale, NJ: Erlbaum & Associates.

Daalaman, T. P. (2008). The medical home: locus of physician formation. *The Journal of the American Board of Family Medicine , 21*, 451-457.

Dall'Alba, G. (2009). *Learning to be professionals.* Brisbane, Australia: Springer.

Dall'Alba, G. (2002). Understanding medical practice: Different outcomes of a pre-medical program. *Advances in Health Sciences and Education , 7*, 163-177.

Dall'Alba, G. (2004). Understanding professional practice: Investigations before and after an educational program. *Studies in Higher Education , 29*, 679-692.

Dall'Alba, G., & Banacle, R. (2005). Embodied knowing in online environments. *Educational Philosophy and Theory , 37*, 719-744.

Dall'Alba, G., & Sandberg, J. (1996). Educating for competence in professional practice. *Instuctional Science , 24*, 411-437.

Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: a critical review of stage models. *Review of Educational Research , 76* (3), 383-412.

Dewey, J. (1934). *Art as Experience.*

Dewey, J. (1938). *Experience and Education.* Canada: Collier-MacMillan.

Dreyfus, H. L. (2002). *A phenomenology of skill acquisition as the basis for a Merleau-Pontian non-representational cognitive science.* Berkeley: University of California, Department of Philosophy.

Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine: The power of human intuition and expertise in the era of the computer.* New York: Free Press.

Dreyfus, S. .., & Dreyfus, H. (1980). *A five stage model of the mental activities involved in directed skill acquisition.* Operations Research Centre. California: University of Berkeley.

Dweck, C. S., & Elliot, E. S. (1983). Achievement in Motivation. In E. M. Hetherington, *Handbook of Child Psychology* (4 ed., pp. 643-691).

Engestrom, Y., Miettinen, R., & Punamaki, R. L. (1999). *Perspectives on Activity Theory.* Cambridge University Press.

Eraut, M. (1994). *Developing professional knowledge and competence.* London: Falmer Press.

Ericsson, K. A., & Simon, H. A. (1984). *Protocal Analysis: verbal reports as data.* Cambridge: MIT Press.

Fielding, N. G. (1988a). Competence and culture in the police. *Sociology , 22*, 45-64.

Fontana, A., & Frey, J. H. (2005). The interview: from neutral stance to political involvement. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualititative research.* London: Sage.

Greeno, J. G. (1989). A Perspective of Thinking. *American Psychologist , 44* (2), 134-141.

Grusec, J. E., & Goodnow, J. J. (1994). Impact of parental discipline methods on the child's internalisation of values: A reconceptualisation of current points of view. *Developmental Psychology , 30* (2), 4-19.

Hargreaves, A., & Fullan, M. G. (1992). Introduction. In A. Hargreaves, & M. G. Fullan, *Understanding teacher development* (pp. 1-19). New York: Teachers College Press.

Holmboe, E. S., & Hawkins, R. E. (2008). *Practical guide to the evaluation of clinical competence.* PA, Philadelphia: Mosby Elsevier.

Huberman, M. (1989). The Professional Life Cycle of Teachers. *The Teachers College Record , 91* (1), 31-57.

Hunt, D. (1987). *Beginning with ourselves.* Toronto: OISE Press.

Kinchin, I. M., & Lyndon, B. C. (2010). Reconsidering the dimensions of expertise: from linear stages towards dual processing. *London Review of Education , 8* (2), 153-166.

Kinchin, I., & Cabot, L. B. (2010). Reconsidering the dimensions of expertise: from linear stages towards dual processing. *London Review of Education , 8* (2), 153-166.

Lankshear, C., & Knobel, M. (2004). *Teacher research: from design to implementation.* England: Open University Press.

Lave, J. (1993). The practice of learning. In S. Chaiklin, & J. Lave, *Understanding practice: Perspectives on activity and context* (pp. 3-32). Cambridge, UK: Cambridge University Press.

Lave, J., Murtaugh, M., & de la Roche, O. (1984). The dialectic of arithmetic in grocery shopping . In B. Rogoff, & J. Lave, *Everyday cognition* (pp. 9-40). Cambridge: Harvard University Press.

Lester, S. (2005). *Novice to Expert: the Dreyfus model of skill acquisition.* Retrieved January 01, 2012, from http://www.sld.demon.co.uk/dreyfus.pdf

Little, J. W. (1993). Teachers' professional development in a climate of educational reform. *Educational Evaluation and Policy Analysis* (15), 129-151.

McDermott, R. P. (1993). The acquisition of a child by a learning disablity. In S. Chaiklin, & J. Lave, *Understanding practice: Perspectives on activity and context* (pp. 269-305). Cambridge, UK: Cambridge University Press.

Pea, R. D. (1987). Socialising the knowledge transfer problem. *International Journal of Educational Research , 11* (6), 639-663.

Pena, A. (2010, June 14). *Medical Education Online.* Retrieved January 01, 2012, from The Dreyfus model of clinical problem-solving skills acquisition: a critical perspective: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2887319/

Perkins, D., Jay, E., & Tishman, S. (1993a). Beyond Abilities: A dispositional theory of thinking. *Merrill-Palmer Quarterly , 39* (1), 1-21.

Perkins, D., Jay, E., & Tishman, S. (1993b). New conceptions of thinking: From ontology to education. *Educational Psychologist , 28* (1), 67-85.

Polanyi, M. (1969). *Knowing and being.* Chicago: The University of Chicago Press.

Prawat, R. S. (1989). Promoting Access to Knowledge, Strategy and Dispositions in Students: A Research Synthesis. *Review of Education Research , 59* (1), 1-41.

Putnam, R., & Borko, H. (1997). Teacher learning: Implications of new views of cognition. In B. J. Biddle, T. L. Good, & I. F. Goodson, *The international handbook of teachers and teaching* (pp. 1223-1296). Dordrecht, Netherlands: Kluver.

Putnam, R., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher* , 4-15.

Roberts, G. (1996). 'Narrative history as a way of life'. *Journal of contemporary history* (31), 221-225.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context.*

Rubin, J. (1996). Impediments to the development of clinical knowledge and ethical judgment in critical care nursing. In P. Benner, C. A. Tanner, & C. A. Chesla, *Expertise in Nursing Practice: Caring, clinical judgement and ethics* (pp. 170-192). New York: Springer.

Rushbrook, P., Choy, M., & Tan, R. (2013). *Reflective Curriculum Development Approach.* Singapore: Institute for Adult Learning .

Ryan, M., Fook, J., & Hawkins, L. (1995). From beginner to graduate social worker: Preliminary findings of an Australian longitudinal study. *British Journal of Social Work , 25*, 17-35.

Sandberg, J. (1994). *Human competence at work: An interpretive approach.* Goteborg, Sweden: Bas.

Sandberg, J. (2000). Understanding human competence at work: An interpretive approach. *Academy of Management Journal , 43*, 9-25.

Sandberg, J. (2001). Understanding the basis for competence development. In C. Velde, *International perspectives on competence in the workplace* (pp. 9-26). Dordrecht, The Netherlands: Kluwer.

Sandberg, J., & Pinnington, A. (2009). Professional Competence as Ways of Being: An Existential Ontological Perspective. *Journal of Management Studies , 46* (7), 1138–1170.

Sarantakos, S. (1992). *Social research.* Melbourne: Macmillan.

Savickas, M. L. (2001). The Theory and Practice of Career Construction: Putting theory and research to work. In S. D. Brown, & R. W. Lent, *Career Development and Counseling* (3 ed., pp. 42-70).

Schmidt, F. L., & Hunter, J. E. (1993). *Tacit knowledge, practical intelligence, general mental ability and job knowledge.*

Schon, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions.* san Franciso: Jossey-Bass.

Schon, D. A. (1983). *The reflective practitioner: How professionals think in action.* New York: Basic Books.

Simons, M., Harris, R., & Smith, E. (2006). *The Certificate IV in Assessment and Workplace Training: understanding learners and learning.* Retrieved 2012, from NCVER.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research; grounded theory procedures and techniques.* California: Sage.

Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionistic approach. *Strategic Management Journal , 17*, 11-25.

Tsoukas, H., & Vladimirou, E. (2001). What is organisational knowledge? *Journal of Management Studies , 38*, 973-993.

Willmott, G., & Karmel, A. (2011). *The WSQ: a retrospective. Reflections on the development, implementation and future of Singapore's national CET system.* Singapore: Institute for Adult Learning.

Winograd, T., & Flores, F. (1986). *Understanding computers and cognition: A new foundation for design.* Norwood, NJ: Ablex.

Worthy, C. (1996). Clinical ladders: Can we afford them? *Nursing Management , 27*, 33-34.

WSQ. (2009). *Training Roadmap.* Singapore: Workforce Development Agency.