

**MEASURING AND CERTIFYING SKILL AND
COMPETENCE IN THE CARIBBEAN:
Some Conceptual and Practical Issues**

Theodore Lewis

This article tries to look deeply at skill and competence, hoping to unearth pitfalls that might obstruct the way of those who are striving towards the development of a Caribbean Vocational Qualification (CVQ) system of skills classification in the region. Aspects of the skills debate that attend the discourse on the global economy are highlighted. The problematic nature of competence is examined, especially where there is contention regarding whether or not competence can be measured. Differences between expert and novice conceptions of tasks are explored, as are differences between *techné* and phronesis. Whether the ideal of phronesis is attainable across traditional crafts is considered.

Background

Like many other countries around the globe, Caribbean countries have bought into the idea of vocational qualification ladders, where each rung supposedly represents a degree of skill attainment and, by extension, a level of competence (see a sample framework in Figure 1). The Caribbean Vocational Qualification (CVQ) schema has been adopted by the Caribbean Examinations Council (CXC), and significant numbers of secondary school students who have pursued TVET courses have been granted certificates based on CVQs. Individual countries have their own frameworks and are gradually coming around to meeting the requirements of the Caribbean-wide one. The regional aim is to operationalize the idea of a CARICOM Single Market and Economy (CSME), by creating a common skills framework to facilitate the mobility of labour across borders. CVQs are intended to standardize skill and competence such that, say, a carpenter certified in Jamaica via CVQs could find work in Trinidad and Tobago or Guyana; her CVQ communicating her ability to the employer. CVQs are intended to ensure that there is parity of skill levels, occupation by occupation, from one country to the next. This could also mean that the training systems across countries are synchronized around the same set of skill standards. That at least is the theory. The future will determine whether the CVQ approach

Theodore Lewis

will take hold, and if indeed it would be the ready way to assess the scope and depth of the stock of skills in the region. Moreover, it remains to be seen whether the CVQ approach can be the basis of a rise in skill levels in the region, in keeping with regional needs and global standards.

Whether the CVQ approach would enjoy wide acceptance among employers and trade unions across the region is a matter of conjecture. A concept paper on TVET pointed out numerous implementation hurdles, including lack of industry participation in the approval of skill standards, and absence of an accreditation body to support assessment activities (Boodhai, n.d.).

Level 1 - Apprentice/supervised worker - for example, a stitcher.
Level 2 - Skilled worker - for example a skilled drapery professional in a drapery company.
Level 3 - Skilled technical/supervisory worker - for example a drapery teacher, a supervisor or a sole proprietor.
Level 4 - Professional/managerial/ master craftsman - for example a manager of a drapery company.
Level 5 - Chartered professional/ managerial for example the CEO of a drapery company.

Figure 1. The Caribbean Vocational Qualification (CVQ) Scheme for Home Furnishings (A Class Draperies & Interiors Ltd., n.d.).

What countries and regions are after is improved competitiveness in the global economy, and they hope to get there by raising skill levels in the workforce. But in the discourse on competitiveness, skill has become an elusive concept, with strong social and cultural determinants, and with a decided tendency away from the technical. For example, Carnevale, Gainer, and Meltzer (1990) set forth a very influential taxonomy of skills that employers want for global competitiveness, in a framework that left out technical skill. Clarke and Winch (2006) have shown that *skill* has a different meaning in Germany than it does in the United Kingdom. In the UK, skill qualifications signal technical competence, while in Germany skill goes beyond the technical to confer social status and recognition on those who are certified (see also Brockmann, Clarke, & Winch, 2008).

What work requires of labour market entrants has almost universally settled on a set of social and intellectual attributes, such as learning how to learn, problem solving, and ability to work in teams. But these transversal abilities (Winch, 2013) alone could not yield, say, the construction boom that China has witnessed in recent decades. A reason

Measuring and Certifying Skill and Competence

for the unsettled nature of the discourse on skill and competence is that not all skills are public, and some are socially constructed. For example, flight attendants and bank tellers must display the emotions that go with the professional image required for these jobs. Skill for them includes a sizeable component of aesthetics. Nonaka (1991) has asserted that while some skills are explicit, and observable; others are tacit, and not easily documentable. Unions and management rarely agree on how much skill or competence inheres within particular jobs and, accordingly, on how much workers who possess demonstrable amounts of each should be compensated.

A commonplace cliché about global competitiveness is that it is premised on *high skill*. But sometimes what is meant by this is simply higher levels of education and training, or greater numbers of people in the workforce who are capable of functioning in STEM (Science, Technology, Engineering, and Mathematics) environments. In recent decades, the conversation on skill and competitiveness across countries has included comparisons of the performance of children at particular grade levels on standardized mathematics and science tests, such as the TIMSS (Trends in International Mathematics and Science Study).

Mindful of the unsettled nature of the concepts *skill* and *competence*, as suggested above, this article offers a caution for us in the Caribbean as the region proceeds in its quest to consolidate the CVQ approach. The aim is not to cast doubt upon the efficacy of this approach, but rather to suggest the need for a critical posture in assessing the capabilities of people in the region, in devising skill hierarchies, and in the administration of training programmes.

The Skill Debate

We may separate the skill debate into two reasonably distinct phases: 1) that which focused on whether skill in the workplace was being overtaken by technology, the centrepiece of which was Braverman's (1974) deskilling theory; and 2) the more recent extension of this question, which asks what skills are needed for global competitiveness. Braverman contended that the purpose of the introduction of technology in the workplace was to deny workers the autonomy and discretion that skill granted them. Technical skill was power. Spenner (1983) had defined skill not just in terms of *substantive complexity* of work performed, but the degree of autonomy and discretion that the worker is allowed to exercise on the job. Deskilling theory was suggesting that the purpose of managers when they introduced technology into the workplace was to denude the power of workers.

Theodore Lewis

There is evidence now that in both blue- and white-collar occupations, technology indeed deskilled many jobs by shifting the locus of discretion away from workers to machines and to management. Many craft skills are now embedded in software. Kalleberg, Wallace, Loscocco, Leicht, & Hans-Helmut (1987) proclaimed the “eclipse of craft” in reporting a case study of technology takeover of the printing industry. This industry now has been transformed globally, with software having replaced the traditional skills of the industry, especially in the pre-press phase of the printing process. Drafting has been transformed by Computer Assisted Drawing (CAD). Machine shop crafts have now similarly been transformed with Computer Assisted Manufacturing. Sayce, Ackers, and Greene (2007) reported a case of the destruction of craft and craft identity in the carpet weaving industry with the introduction of technology. Technology has impacted not just on blue-collar work but white-collar as well. The US insurance industry is shown to have been deskilled, and hollowed out, because of the impact of the computer (Hecht, 2001).

An opposing view was that technology empowered workers, giving them more capability to accomplish their jobs. In support of this “upskilling” effect of technology, Militello and Hutton (1998) contend that in many industries technology increases the cognitive demands of jobs by performing the more routine or procedural aspects of the work, so that people could concentrate on more cognitively demanding work that requires inference, diagnoses, judgement, decision making, and problem solving. They are supported in this view by Gazarian (2013), who provides a perspective from the field of nursing. In perhaps the most compelling case offered in support of the positive effects of technology on skill, Zuboff (1984) proclaimed that up-skilling of craft in a pulp-making factory, where she documented the demise of tacit knowledge as new sensory instruments meant that workers no longer had to squeeze handfuls of pulp to determine the state of the process. The body no longer had a place in skills she proclaimed. Needed now were “intellective” skills that could be in tune with the “informating capacity” of the new technology. She illustrated the challenge for workers as they encountered this new data-driven environment where before they would rely on their own intuitive senses:

In plants like Piney Wood and Tiger Creek, where operators have relied upon action-centered skill, management must convince the operator to leave behind a world in which things were immediately known, comprehensively sensed, and able to be acted upon directly, in order to embrace a world that is

Measuring and Certifying Skill and Competence

dominated by objective data, is moved from the action context, and requires a qualitatively different kind of response. In this new world, personal interpretations of how to make things happen count for little. The worker who has relied on intimate knowledge of a piece of equipment—the operators talk about having “pet knobs” or knowing just where to kick a machine to make it hum—feels adrift. To be effective, he must now trade immediate knowledge for more explicit understanding of the science that undergirds the operation. (p. 72)

Zuboff reports one manager in the new refurbished plant as saying:

Once we put things under automatic control and ask them to relate to the process using the computer, their general judgments about how to relate to equipment goes by the wayside. We are saying your intuition is no longer valuable. Now you must understand the whole process and the theory behind it. (p. 72)

But Zuboff’s reading of the worth of tacit knowledge has proven to be well off the mark, as tacit skills associated with the information technology industry are now widely perceived to be the skills of highest value in workplaces, and constitute a new source of labour process tension in the workplace (see Lewis, 2013).

It is the case that, globally, we are fully in an information age in which there are more service jobs than manufacturing ones. This, arguably, might be an effect of deskilling. Technology in its various forms is central to performance everywhere—in hospitals, schools, banks, and offices; or on farms, factory floors, and construction sites. Robert Reich (1991), former US Secretary of Labor, wrote in *The Work of Nations* that in the global economy the highest premium has to be placed upon symbolic-*analytic* skills that only 20% of the American workforce possesses.

There is consensus among nations that the global economy demands high skills to deal with innovation and change. This type of skill is needed where knowledge work abounds. In their book *High Skills: Globalization, Competitiveness, and Skill Formation*, Brown, Green, and Lauder (2001) take the view that the new focus on knowledge work has caused the developed economies to increase the numbers of highly trained people for roles in technical, professional, and managerial employment. Green and Sakamoto (2001) identified four types of high skill strategies to be seen across developed countries. They point out that in the US and UK skill polarization can be observed. While many citizens get the skills needed for the global economy, many others do not.

Theodore Lewis

Lloyd and Payne (2006) point out that in the UK, despite talk of high skills, the economy continues to produce low-skills—low value-added products, leading to a low skill equilibrium condition.

Ashton and Sung (2005) have found that high skills in the new economy are more likely to be found in High Performance Work Organizations, places where one would find high employee involvement practices (such as self-directed teams); human resource practices such as work re-design and mentoring; and reward and commitment practices such as family-friendly policies.

But the jury is still out on whether these types of workplaces abound, and whether they indeed require high skills. This aspect of the high skills debate raises for us in the Caribbean questions about what kinds of workplaces are needed in the region if globally competitive products and services are to be produced here. This is the demand side of the question of skill. A further question, on the supply side, is whether the current institutional infrastructure we have for delivering skill is at the level of quality required to develop world-class graduates.

Tacit skills

As indicated above, Zuboff (1984), in her book *In the Age of the Smart Machine*, provided a forecast of the impending demise of tacit knowledge at work. The era of knowledge derivation through sensory cues was at an end. Where workers would rely on the inexactness of visual, aural, or tactile cues, essentially on art, they now had to abandon these folkways to give way to the exactness of computerized instruments. But this heralding of the end of tacit knowledge has proven to be premature. Indeed, in the new knowledge economy that defines globalization, driven as it is by computers, tacit knowledge is now viewed as the kind of knowledge most prized and most associated with high value-added enterprise and innovation. On this, Nonaka (1991) has written that Japanese managers are more successful than Western ones, because they are able to tap “the tacit and often highly subjective insights, intuitions, and hunches of individual employees and making those insights available for testing and use by the company as a whole” (p. 97).

Tacit knowledge is not dead. It is as critical to industry here in the information age as it was in the craft age. It is a part of white-collar work just as it is a part of blue-collar work. Berner (2008) provides an account of skill that is premised on tacit knowledge, where the competent performer reacts and makes decisions based on bodily cues, vibrations he/she feels or hears, sluggishness observed in the movement of a

Measuring and Certifying Skill and Competence

machine arm, or a change in the cadence of the noise made by the machine as it flows. He writes that the skilful worker is often ahead of technological indicators. This worker can draw on a repertoire of sensory indicators, based on local history of problems, and fixes employed as correctives. The skilled worker would have created “webs of constraints and affordances that the newcomer has to understand” (p. 326). Berner goes on that:

It is evident that understanding machines is a complex cognitive, bodily, and emotional achievement. It is also – contrary to the Taylorist notion of a ‘one best way’ to do a job – a variable performance, involving many individual styles and repertoires. (p. 331)

Doubtless there are classes of skilled work in the Caribbean in which tacit knowledge is the dominant mode of operating. In the currently defunct sugar industry of Trinidad and Tobago, the class of workers who were sugar boilers functioned entirely in the tacit realm. These workers objected to electronic probes being used to check the viscosity of sugar syrup, and instead relied on their senses of observation and feel to make decisions about the maturity of sugar crystals. Sugar remains vibrant in Guyana, Jamaica, and Barbados. The certification of the skills of sugar boilers could present interesting challenges. Likewise, other classes of workers across the Caribbean who have acquired competence by rote methods will present challenges at the point of assessment. Such workers will be found not just in the sugar industry, but also across typical industries such as automotive, construction, garment, and computing, among others. Deciphering tacit knowledge would be one of the key challenges for those involved in certifying mature workers and others who have not learned their skills in formal environments. Prior Learning Assessment and Recognition (PLAR) could be one of the more demanding aspects of the CVQ approach, because most of this kind of learning is in the tacit realm, where the skills are largely implicit.

The Competence Question

Competence is the other side of the coin of skill. In its plainest meaning, it is what a person is capable of accomplishing in a particular domain—the latent potential to perform. A person may be competent in cricket or football, pan tuning, fishing, playing the piano, plumbing, or medicine. Competence may be acquired formally or informally. That is, some people may acquire competence via technical school or university training. Others may do so in structured apprenticeships or by unstructured pick-up methods. In the Caribbean, some people acquire

Theodore Lewis

construction-related skills such as carpentry and brick laying by working among communities of practitioners on construction sites. Some gain auto-mechanic skills in automotive garages in similar fashion. Depending on the manner in which one acquires competence, its formal knowledge component may vary. Fishermen who learn their jobs by informal apprenticeships may not know navigation rules. Some pianos do not understand formal music. Many people who are competent in the craft realm, such as basket weaving, do not have formal theory on which they rely. In Trinidad and Tobago at an earlier time, people practised dentistry and midwifery without having formal medical training. Thus competence is made problematic by the fact that performance alone is not the full story.

Accompanying the now rampant Vocational Qualifications movement globally has been a debate about the nature and components of competence. This can be seen particularly in Australia and the UK, where a healthy exchange has ensued for the last two decades around the use of competency-based assessment in vocational education. In this debate, philosophers at the universities challenge vocational policy makers on whether competence is measurable, and whether it is educationally sound policy to conflate technical competence with educational outcomes. At the centre of the debate has been Paul Hager, the acknowledged leader of the philosophical discourse that surrounds Australian vocationalism (see, for example, Hager, 1995). Hager and his colleague David Beckett have been trying to influence vocational education in Australia away from a technicist conception of competence towards a more humanistic and holistic one (see Hager & Beckett, 1995). They have been influenced by the integrated approach taken by the professions in Australia in the assessment of competence.

Hager and Beckett (1995) contend that competence cannot be measured and must be inferred from behaviour. Assessment of competence has to be made based on a specially chosen sample of tasks. In the integrated approach it is important that one displays technical capability, but added to this are the practitioner's attributes and the character of the context of the job. In a discussion of what constitutes competence in the Australian model, Hager and Gonzi (1996) wrote that the attributes central to job performance include cognitive (e.g., critical thinking and problem solving); interpersonal; and technical skills. They contend that when these attributes are taken together with major job tasks, competency standards can be attained. There is a sense in which this so-called "integrated" view of job performance offered from Australia seems familiar, and not at all far away from the typical *affective*, *psychomotor*, and *cognitive* approach that has been the

Measuring and Certifying Skill and Competence

mainstay of skill conception within American vocationalism. Thus there might be some stability internationally that competence is a composite concept. But whether the component parts could be dissected is a matter of contention.

With National Vocational Qualifications in the UK as the backdrop, Gerald Lum has been a part of the competence debate, not so much opposing as offering refinements to arguments. Lum takes issue with the idea of competence as outcomes of vocational education, especially where it is to be determined on performance on a set of technical tasks. Lum (1999, 2004, 2013) contends that the technical and humanistic aspects of competence are too dissimilar to be held to constitute a single construct. One idea which unites those in the debate is that competence should not be approached from the basis of dissecting jobs into their composite elements, as is done in job and task analysis. They view this approach as “reductionist” and yielding little about the competence that is embodied in the person. They believe that much more can be yielded about job competence by looking at the performer holistically, by considering the integration of generic skills. Competence is embodied in the performer.

The philosophers who have engaged in the critique of the competency-based approach to vocational assessment betray partiality to a mind-body dualistic ontology. They see competence in terms of the immaterial and the material, mind and matter. There are the technical tasks with their exactness, and given to reductionism; then there are the cognitive attributes that are not public, but which are central to competence. In the writings of Lum we see clearly what bothers the philosophers on this count. He writes:

Of all the various manifestations of human capability the least tangible and the least disposed to precise explication are those *centred in the person* (my emphasis): the understandings, the capacities for judgement, imagination, problem-solving and the host of other propensities and proficiencies that are so vital for competent action. There is thus an important sense in which the inclusion of these attributes is fundamentally *incompatible* (my emphasis) with the demand for a specification which is precise and unambiguous. (Lum, 2004, p. 489)

But on the question of what constitutes competence, the philosophers cannot reject the historical evidence of myriad pilots, dentists, surgeons, machinists, and nurses, among others, who have been trained on competency principles that take into account the elements of what they must do, what they must know, and the dispositions they must possess to

Theodore Lewis

be successful practitioners. The vocational educator cannot afford to hold the fear of concreteness that we see in the advocacy of the philosophers. Eventually, the crane operator must lift and safely place the container on the ship. And whether she can do this in actuality must be certified. However, the philosophers make an important point about which the vocational assessor must take heed, and it is that we have to be somewhat circumspect about how we arrive at the decision that person X is now competent enough to be hired as, say, a crane operator.

Recently, a crane destroyed a building in a famous American city, due to the error of an operator who was found to be under the influence of an illegal substance while working. The recent sinking of a cruise ship in the Mediterranean, in which several lives were lost, was due to a captain who deviated from the specified sailing procedure set in place by his employers and consistent with maritime law. These two examples highlight a side of competence not sufficiently discussed in vocational education, that is, the question of ethics. It speaks not so much about what a person can do, but about what kind of person he/she is. Can this person be trusted to act in an honest manner on a job located in a private home? Unlike the professions, the vocational occupations typically do not have codes of ethics to which initiates must subscribe. This is the case although malpractice on the part of people in craft and technician occupations could lead to the loss of life of affected people, or the destruction of property. A careless mechanic could cause a vehicle to malfunction on a hill, or on a busy highway. A careless nurse could cause a patient to overdose. This issue will surface later in the paper in the discussion of *phronesis* and *techné*.

Competence as lived experience

One school of thought about competence is that it must be viewed not just from observing people as they perform, but from eliciting from them the mindset they bring as they do so. Competence becomes lived experience. Benner (2000) contends that nursing competence derives from immersion in the practice. It is learned as it is enacted. An iconic study on this question is that reported by Sandberg (2000), conducted among engineers at an automotive plant. Sandberg contended that current attempts to understand competence among workers tended to be rationalistic in nature, and that multiple conceptions of competence are conceivable, including (a) that it resides in the worker, and (b) that it resides in the work itself. But Sandberg notes that rationalistic methods separate the worker from the work, and attempts are made to pre-define what competence is. But an interpretive approach rejects such a stance,

Measuring and Certifying Skill and Competence

reuniting the worker and work, and taking the view that competence is *the meaning that work takes on for the worker*. He notes that interpretive studies of work consistently find that the attributes brought by workers to the work depend on the work context. Using this approach, his study demonstrated that competence may indeed have to do with mindset.

All of the engineers in the study were involved in the design of cars, and were referred to as engine optimizers. The basic question had to do with how they viewed the competence required by an engine optimizer. Three groupings of engineers became possible because of their answers. The first group saw the job as optimizing each attribute of the engine, one at a time. The second group saw the job in terms of interaction of the parts. They examined the effect that optimizing a single attribute of the engine would have on others with which it was integrated. The third group approached optimizing by thinking in terms of how customers experienced the car. Sandberg followed up this phase of the study by asking participants to describe the competence of individual peers. From these results, Sandberg was able to construct a hierarchy of competence based on the level of comprehensiveness members of each group brought to their conception, with the group expressing the customer approach rated the highest, followed in order by the integrated group and the serial group. It can also be seen that by using an interpretive approach Sandberg was able to arrive at a view of competence that was in line with a core idea relating to expert knowledge, which is that experts and novices hold different *mental models* of jobs.

Expertise

Expertise is the capability of performing tasks at the highest levels of competence within a domain. The research on expertise draws distinctions between experts and novices, and the stark differences have helped to shed light on ways in which experts are distinctive. Experts are different from the novices on a number of counts. A critical one is in the relative sophistication of the mental models they hold. A mental model is the cognitive structure of the problem or task held by the performer. In the Sandberg study discussed earlier, the expert engine optimizers viewed their task from the point of view of a customer. The less accomplished ones focused upon singular engine components. Hmelo-Silver and Pfeffer (2004) found that there were differences in how experts and novices represented knowledge of a complex, interconnected system. Using a Structure–Behavior–Function (SBF) approach they found that, for the experts, the behaviour and functional realms served to represent phenomena and their relationships. For the novices, structure

Theodore Lewis

was more valuable. Rottman, Gentner, and Goldwater (2012) studied categorization differences between experts and novices, and found that experts sorted by causal category, while novices sorted by domain. Novices sorted fish by appearance, experts by ecological factors.

In an article in which the focus was on teaching students in science to understand complexity and to hold mental models that led to better understanding, Jacobson (2001) found that expert students, by virtue of their degree of exposure to scientific coursework, brought different epistemological and ontological insight to bear on their solution of a given environmental problem. The experts solved the problem in a non-reductive way. For them, order was the result of decentralized action. For the novices, order came from centralized control. Haerem and Rau (2007) found that experts and novices pay attention to different aspects of a task, and that this affects both their perceptions of task complexity (i.e., task analyzability and variability) and their performance on the task. Experts and novices performed the same on surface feature tasks. When the task had deep features, experts performed better.

Evidence suggests that as the degree of expertise increases with deliberate practice, repetitive and routine behaviour gives way to innovative action. Persons with greater expertise have a better cognitive picture of the task at hand, and are able to marshal more cognitive resources as they take action. In one of the pioneering studies of expertise, Chase and Simon (1973) found that expert chess players had superior memory of the game situation. They could reconstruct aspects of a game more quickly than could novices. Experts see the problem in “chunks.” They see structures and relationships not seen by novices. According to Chase and Simon, experts become so because of accumulated practice. They wrote that behind the actions of the expert lay “an extensive cognitive apparatus amassed through years of constant practice. What was once accomplished by slow, conscious deductive reasoning is now arrived at by fast, unconscious perceptual processing” (p. 56). It was their view that about 10 years of practice was needed to become expert in a particular field.

Because they feature in expert behaviour, mental models have become important as an instructional tool, and aid in student learning. It has been found that the use of a mental model in teaching how a device works improved learning of the device (Kieras & Boviar, 1984). Day, Arthur, and Gettman (2001) examined knowledge structures as a proxy for skill learning and retention, and found that the similarity of trainees' knowledge structures to an expert structure correlated with skill acquisition, and prediction of skill retention and skill transfer.

Measuring and Certifying Skill and Competence

Experts have a vast storehouse of schema that are experiences encountered in the past. When they confront a situation, a quick scan reveals whether or not this lies in memory. Expertise here becomes searching for and finding solutions. This schema of past experiences can be of great help, say, in the trauma centre of a hospital, when the life of a patient is on the line. It can be the basis of quick decision making, and indeed of intuition as to the nature of the problem on hand (e.g., Kahneman, 2002).

The case of nursing

Beyond the traditional distinction between the registered and the practical nurse, there has transpired in the professional literature of nursing a discourse on the nature of nursing expertise. In North America, and probably elsewhere in the developed world, nursing has expanded its professional range considerably. One can become credentialed in two-year technical and community colleges, but also can enter a nursing education track that culminates with the doctorate. There is high demand for nurses worldwide, which has resulted in massive migrations of them from the developing to the developed world. It is not surprising then that with so much cross-border movement, the profession internationally has been preoccupied with the question of assessing nursing competence, since certification standards would vary from country to country, and the context in which nurses work would vary greatly. One major variable here is that the level of technology with which the nurse must interact routinely in developed settings is higher than in developing ones like in the Caribbean, and the margin for error is lower because developed societies are more litigious.

What makes the discussion of expertise in nursing quite interesting is the fact that, more than being a technical pursuit, nursing subscribes to an ethic of care. It is difficult to see how a nurse could become competent or expert, if he/she does not bring some order of compassion to the work. Nursing is also very much a cognitive pursuit requiring wide-ranging content and communicative knowledge. The nurse must work in a team that includes doctors of varying specialties. The dominant voice on the question of nursing expertise internationally has been that of Patricia Benner, for whom *intuition* is the primary way to distinguish the expert nurse from other nurses.

Benner (1982) drew on the work of Dreyfus and Dreyfus, who had proposed a model of skill acquisition to the US Air Force. The model was comprised of five levels: Novice, Competent, Proficient, Expert, and Mastery. The last two levels required intuitive decision making. Dreyfus

Theodore Lewis

and Dreyfus (1986) found that as people undergo training they pass through stages of skill acquisition, and their level of expertise increases. People also develop situational memory, which expands greatly over time. Ultimately, the performer could draw on this memory almost instinctively. This is the content of intuition. A machinist could remember a particular situation from past jobs. Thus people do not leap suddenly from declarative knowledge, *knowing that*, to procedural knowledge, *knowing how*. They come over time to the point of unconsciously recognizing new situations as being similar to remembered ones. Benner adapted the Dreyfus model of skill in proposing a skill schema for nursing that reflected the progression from novice to expert. Her model was as follows:

Level I	Novice
Level II	Advanced beginner
Level III	Competent
Level IV	Proficient
Level V	Expert

The last two levels are characterized by intuition. She described episodes where the intuition of nurses was such that they could challenge the decision making of doctors in particular situations.

Benner and Tanner (1987) delved into the role of intuition in nursing expertise, contending that it separated the novice from the expert. Intuition was “knowledge without a rationale.” They distinguished between illness and disease, and the differences in human response that each required. Illness required human care—the compassion of the nurse. The skill required is in the tacit realm. Disease is in the realm of physiology, and requires scientific intervention—medicine.

This ontological stance—of disease versus illness—situated nursing at its essence in the realm of lived experience. Nursing belonged more to phenomenology than to science. The expert nurse spends more time with the patient than do doctors, and can make observations about patients by relying on cues developed over time. Their sharing of observations and hunches about patients can lead to doctors making critical pre-emptive interventions in the care of patients. Benner (1982) contended that because intuition was not an easily observable attribute, the expertise of a nurse, at higher levels, should be done on the basis of *peer review*.

Agreeing with Benner, and in line with Sandberg, Hampton (1994) conceived of expertise in nursing more in artistic than empiric terms. She argued that expert nurses do not always use conscious reasoning—that indeed they often rely on intuition, learned over time. While Benner has

Measuring and Certifying Skill and Competence

been the most dominant voice on the question of nursing expertise, her advocacy of intuition, and her view of nursing as belonging more in the realm of phenomenology, has not gone unchallenged. For example, Ericsson, Whyte, and Ward (2007) contend that a new approach to expertise is needed, which focuses not on nurses in most typical situations but in less frequent challenging ones, to identify superior performers. Rather than intuition, they speak of the expertise of nurses who are capable of *reproducibly superior performance*. But, like expertise, this type of performance has been attributable to extensive training and feedback. Further, nurses who produced consistently superior performance were found to have come to their expertise not by just by passive accumulation of experience, but “by active engagement in deliberate practice, where aspiring experts acquire mental representations to monitor, control, and refine their performance” (p. 11). Ericsson et al.’s view was that superior performers in nursing would be better identified by choosing not most typical situations but less frequently used ones requiring flexibility and speed. This is in line with what is known about expert behaviour (as compared to novices) as discussed earlier in this article. These types of situations are shown to reveal individual differences.

Gazarian (2013) has examined studies focused on nurses’ use of the Critical Decision Method (a form of cognitive task analysis) in practice. Critical Decision Making takes into account the stressful work context in which nurses have to perform. The aim was to understand better how nurses dealt with cognitive challenges. The researcher tries to identify cues that experienced practitioners rely upon as they solve problems in the heat of action. What was the nurse seeing, hearing, smelling in the particular situation? The method accepts intuition as part of what the nurse does, and looks inside of intuition to see patterns. One finding is that nurses rely on an array of strategies when they are confronted with challenging situations. Simmons (2010) writes that nurses employ clinical reasoning methods as they make decisions under conditions of uncertainty, risk, and complexity. Nurses employ both formal and informal thinking strategies to gather patient information, evaluate its significance, and determine alternative actions. Heuristics (informal thinking strategies that are cognitive shortcuts) enable the nurse to review extensive patient information quickly by using various mental techniques.

Theodore Lewis

Phronesis versus Techné

As indicated earlier in this article, the technical and vocational fields suffer on account of dualistic mind/body conceptions, such that the technical is often kept separate from the emotional. Concern for the client might not be viewed by the technician as a part of his/her skill set. But if a computer problem is not diagnosed and solved in reasonable time, the client's business could suffer loss. That kind of awareness on the part of the technician must be a critical aspect of his/her expertise. When the home economist offers dietary advice to clients, his/her work is thereby impacting on their health and nutrition, and quality of life. The mechanic who does not make final checks could cause a vehicle to malfunction in a manner that imperils the customer.

In *Nichomachean Ethics* (trans. 1909), Aristotle provided a way to distinguish between skill that is nakedly technical and concerned primarily with science-like exactness, which he referred to as *techné*, and skill where the bearer had a reflexive, subjective response to fellow human beings, which he referred to as *phronesis* or practical wisdom. There is now a growing literature, not just in TVET but also in teacher education and medicine, among other fields, that technical competence alone (*techné*) is an insufficient determinant of expertise, and that *phronesis* is the more desirable goal if the aim is thoughtful practitioners. Winch (2006) has suggested that the journey from novice to expert may be framed by the idea that the vocational learner makes the progression from *techné* to *phronesis*. Part of his reasoning is that *phronesis* has a social dimension, and that it is acquired in the context of communities of practitioners, not just by solitary toil. Breier (2009) has argued that *phronesis* abounds among people who have acquired expertise in non-traditional ways and who might be seeking recognition for their prior learning.

Nursing is one area of TVET that has embraced *phronesis*, perhaps because by its very nature it demands that practitioners embody an ethic of care. Benner (2000) addresses this dimension of nursing in a work in which she characterizes nursing expertise in moral/ethical terms, adopting Aristotle's notion of embodied competence. Benner's stance is that nursing is about thinking, but also about emotion. It is an embodied practice, she contends—a lived rather than a mastered experience. The warmth of the nurse and the compassion for the patient are not adjunct attributes; they are in fact fundamental dimensions of the nurse's expertise. She identifies seven kinds of attributes that are constitutive of the expertise of the nurse, paraphrased as follows:

Measuring and Certifying Skill and Competence

1. relational skills in dealing with people in terms of their particularity
2. ability to recognize when a moral principle is at stake
3. knowledge that allows ethical comportment
4. moral deliberation and communicative skills
5. understanding of the goals and ends of good nursing practice
6. character development in the context of a community of practice
7. capacity for love and compassion

To what extent can we transfer the attributes that Benner believes to be requisite dimensions of the expertise of the nurse to other technical occupations, such as carpentry, welding, fashion designing, or home economics? TVET instruction historically has included affective aspects of jobs. But the affective domain is often the most neglected one when we observe performance on actual jobs, perhaps because technical results can often be achieved while ignoring affective concerns. Routinely one sees violations of safety regulations at construction sites, for example, people without safety glasses or hard hats, when they really should be wearing these. The phronesis approach says that the affective is not just an adornment to the craft or technician discipline, rather it has to be integral to it.

Some Reflections and Implications

The purpose of this article was to try to superimpose upon the current discourse of CVQs in the region a discourse dealing with the challenges attending the conceptualization and measuring of skill and competence. The primary hurdle of any attempt to add an agenda item to the already fully developed conversation on skill and competence in the region is that normative conceptions of these already exist. For example, if we look at the five levels of CVQ competence in Figure 1, it can be seen that the underlying logic of the CVQ is occupational hierarchy. Fundamentally, this logic, as understood in the wider society, runs roughly as follows: labourer, craftsperson, technician, Engineer, Manager. Accordingly, if, say, an electrician seeks CVQ validation of her competence, she may find that there is no room for her beyond Level II without her pursuing further training to the technician level. Further, within Level II she will find that there are no gradations of skill. Most trained electricians will find themselves locked at this level upon certification, along with others from all of the traditional craft areas, such

Theodore Lewis

as plumbing, welding, or masonry. There could be a bottleneck at the level.

The conversation that has unfolded in this article offers insight into what certification could look like if CVQs take on the challenge of certifying *within domains*. Thus an electrician who is already at Level II, when evaluated on the gross level may wish to find out “what level of electrician am I?” The answer to that question could reveal the person’s level of skill and competence, based on an assessment on her capability on a scale from novice to expert. In some firms and industries in Trinidad and Tobago, there is a tradition for this in terms of A-Class, B-Class, and so on. Thus there are A-Class and B-Class welders, based on performance on skill tests on the job. The message of this paper is that the real work in assessment of skill in the region may have to take place within skill domains, in distinguishing where certified people lie, as they progress in their area of skill.

Another tension uncovered by the conversation in which the article engaged has to do with what is known about the difference between novices and experts in *any* domain. It is shown here that the expert thinks differently about the job at hand than does the novice, and that this difference is revealed in the nature of the mental models they employ as they think about a job at hand. This suggests a new focus in assessment, where people seeking to be tested in a skill area could be challenged with job scenarios for which they must offer graphic or verbal mental models, which would reveal the level of sophistication and creativity they would bring to the task.

Since the aim of CVQs is to certify people on the basis of evidence, and not so much on paper qualifications, it may be the case that many people seeking certification may have accumulated their competence through prior learning on the job. These people may come with tacit understandings but not necessarily formal knowledge. The challenge here, across all of the domains of assessment, would be to arrive at assessment strategies that can test tacit knowledge. Performance is obviously one approach. But, as the concerns of the philosophers who have engaged with this problem show, there is need to unearth the cognitive bases of competence that skilled people can demonstrate. Useful work done in this area through the technique of think-aloud problem solving can be seen in Johnson and Chung (1999). People possessing tacit knowledge also work from mental models that testing can uncover.

Testing and standardizing skill and competence alone will not yield a workforce that is functioning at world-class levels. Along with this there is need for industry in which skills of the new economy are required, and

Measuring and Certifying Skill and Competence

technical and vocational institutions that are offering training in state-of-the-art facilities, taught by instructors who are up to date. The CVQ focuses on testing, and on evidence is far superior to old methods of TVET certification in the region, which ignored practical competence and placed full credence on paper and pencil tests of knowledge. But there are pitfalls in taking this approach, pertinent ones of which have been highlighted here.

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Theodore Lewis

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Theodore Lewis

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