

Mind Dependency on Vocational Skills

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***Abstract:** In this paper attention is drawn to the political, moral and social importance attached to the concept of skills. It is argued that the concept of skills is not univocal, but that they are mind-dependent in ways crucial for teaching practice. It is suggested that Tanzania Vocational Education and Training (VET) policy requires emendation in the light of obscurities in the concept of skills. A number of theories of learning also are examined to suggest that skills acquisition is complex and cyclic, rather than linear and modular as in behaviourist orientated competency-based training approaches. Some ethical implications of certain approaches to Vocational Education and Training (VET) are identified. The paper primarily is concerned with the acquisition of vocational skills- such as in the industrial trade, and professional skills - such as in teaching, but has implications for education and training in many fields.*

Key Words: mind-dependency, vocational training and univocal

INTRODUCTION

In Tanzania, following the establishment Vocational Education and Training Authority - VETA (1994), the concept of skills what are sometimes referred to as 'competencies', sometimes as 'abilities', 'capabilities', and 'attributes' and sometimes characterized as 'higher order', 'core', 'generic' or 'key' have conceptually underpinned Vocational Education and Training (VET) policy development with massive implications for the curriculum content and instructional methods adopted by VET providers.

The concept of skills is pertinent to many disciplines or sub-disciplines. The most obvious of these are economics, sociology, history, psychology and philosophy. These fields, some of them overlap and it is sometimes difficult to say what field it is in which one is working when one is thinking about skills. But in any case, for example, in philosophy, the concept of skills has a significant sub-directory. In metaphysics this problematic concept has received attention since Aristotle, and is given a modern rendering (Ryle, 1999; Polanyi, 2000) among others. But the concept of skills also raises questions of ontology (what kind of things are they?) and of ethics (how should they be acquired?) and epistemology (what sort of knowledge does skilful behaviour require?). There is also a sociopolitical aspect (are skills socially constructed hegemonic ideologies?)

At the political level, there can be little doubt that the concept of skills and their acquisition lies at the heart of national concerns for a competitive Tanzanians

workforce and for an effective education and training system. The concern for training reform in general and with training outcomes rather than learning processes in particular, underpins the VET sector's response to the policy initiatives of the stakeholders. The public, too, have voiced support for schooling based on the aim of providing young people with job related skills (Kosaki, 2000). The concern with skills, the effective acquisition of skills, the ability to secure skills transfer, the concepts of deskilling, multi-skilling and skills attrition or wastage, then, are very much to the forefront of contemporary educational debate. The development of industrial workplace skills in Tanzania is largely undertaken through public and private Vocational Training Centres. Vocational Education and Training Authority (VETA) have responsibility of developing a Competence- Based Training Curriculum (CBT).

Given this political, educational, economic and social scenario it would be reasonable to believe that the concept of skills is unproblematic, that we have a good idea of what skills are and how they are acquired.

THE CONCEPT OF SKILLS

The notion of a skill is problematic (Griffiths, 2001; Vallas, 2001; Ainley, 2006; Evans, 1939). Griffiths, (2001) following Vallas' suggestion (2001) that researchers have used widely varying conceptions of skills which result in inconsistent and contradictory findings, is concerned to show that the confusion which surrounds talk about skills arises from the different kinds of skills which are placed under the general description. Griffiths (2001) also raises questions of ontology. Thus, critical thinking cannot be described as a skill because it both requires a set of skills and because it requires application in a context.

In a different vein Missimer (1990) is concerned with drawing a contrast between the capacity to think critically - conceived as an outcome of skill, rather than as an outcome of character traits. It is not necessary to rebut this view here as doing so would require a good deal of discussion about the concept of character (Alston, 1970; Brandt, 2003). Nevertheless, that critical thinking is connected in some way with certain features of mind (however we might construe this) and perhaps even constituted by certain attributes of mind, is cogently persuasive.

Brandt (2003) has suggested that philosophers have 'special skills' which include the stating and assessing of the worth of arguments. But these special skills do not entail that the objective of philosophy is to do these things. They are *ó* rather, the special means by which philosophy attempts to achieve further objectives. Vallas (2001) argues that this is also critical of bundling a whole lot of things which characterize human activity under the general heading of skills. The major types of skills include physical skills, motor skills, intellectual skills, interpersonal skills, perceptual skills and creative skills. In the light of these, the development of creative skills is different from the development of motor skills, though it is probable that creative skills vary from domain to domain, that one could be creative in some motor skill applications.

This, too, is an important pedagogic point. The way something is taught is dependent on how teachers 'read' the needs of their students and what they have to do to shape the subject content in ways which make it accessible to a range of learners with different learning needs and different levels and kinds of knowledge.

Stevenson and McKavanagh (2008) also argue for cognitive structures underlying skills. They refer to this as 'procedural knowledge'. There are many important differences between skills of an apparent intellectual kind - such as critical thinking - and those of a practical, 'embodied' or motor kind - such as laying down a weld. For one thing, they tend to be learnt differently. *'Doing' type skills* tend to be taught (and learnt) not by formal study - such as reading a book, though this may be part of it - but in a real-life application or a real-life simulation, that is, in a practical way.

But whatever the differences between theoretical type skills and practical type skills they are not as significant as the differences between the different ways of thinking which characterize different forms of activity. Even in paradigmatic theoretical domains the different kinds of thinking involved are likely to be missed under such general appellations as 'prepositional knowledge' (Ryle, 1999).

Ways of thinking - which characterize different disciplines and sub-disciplines, importantly are influential in the kinds of values which individuals are likely to have. It is nevertheless quite often apparent that people view the world from the framework and standpoint of the way basic disciplines shape their thought. Disciplines have different goals to which their characteristic thinking patterns are directed. It is these goals which determine modalities of thought.

Disciplined thought may be descriptive and classificatory, analytic or hermeneutic, quantitative or functional, causal or linguistic, temporal and historical, evidential, speculative or empathetic and so on. Moreover, Stocker (2005) suggested that thought also may be characterized by particularly apposite emotional characteristics. Indeed, it might be suggested that a distinctive kind of thinking is just what goes as a defining condition of a discipline and if this distinctiveness is absent, or corrupted by an amalgam of disciplines such as in teacher education, for example then the activity fails to constitute a discipline.

Sometimes these characteristic means of disciplined thought, determined by the goals at which such thought - or conduct, more generally - is aimed, are transposed, so to speak, into a different realm where they become inefficacious and ineffective. Of course, various disciplines may overlap, or otherwise be related in ways which deliver similarities in patterns of thought. These similarities may be very broad such as in disciplines which depend on rationality (which must be defined in certain, rational ways. However, finer distinctions can be made than that which rests on rationality, or on putative broad cultural differences between the humanities and the sciences to which Stevenson (2008) drew attention.

It is this difference in characteristic modes of thought which is the important contrast between so-called *theoretical skills* and *practical skills*. It is a difference which is essentially a different way of thinking and the commonly understood distinction between know-that and know-how. The know-how suggests a kind of knowledge which is tacit, implicit, embodied and unable to be stated. Moreover, to separate knowledge from language, in the way it is possible to do when appeals are made to tacitness is to open a Pandora's Box. Such a view of knowledge could lead to educational practice which essentially disenfranchised learners, hence the above suggestion of ethical dubiety. Tacitness may be related to a further dimension of *skill* which has been referred to as 'automaticity' (Sloboda, 1991) 'embodied' (Attewell, 1990), 'reflection in practice' (Schon, 2007), 'hidden' (Kusterer, 2007).

However, it is suggested that the knowledge possessed by practical people - whether they be in occupations, vocations or professions, essentially is marked by differences in modalities of thought and by the way in which skills are learnt and not by some qualitatively epistemically mystical different conception of knowledge. Practical skills are not only taught in a practical way, but they are taught within a cultural matrix in which the cast of mind required is shaped by the norms which characterize a discipline.

The concept of skills is even more knotty than the discussion so far seems to suggest. Some researchers suggest that skills are not paradigmatically the property of persons, but are a part of the job which people are required to do. Going even further, some see skills as embedded in an entire workplace culture. That skills are environmentally linked or context dependent has also been argued by Fischer, though Fischer is mostly concerned with a skill theoretic approach to cognitive development (Fischer, 2006; Anderson, 2000). The concept of skills as attaching to disembodied jobs or tasks perhaps presses in the direction of behaviourist models of skills development since human action, on this externalized conception of skills, might be understood as a response to environmental stimuli.

In any case, the concept of skills as the property of individuals (human capital theory) gives rise to the emphasis on training individuals, rather than on workplace reforms more generally. In relation to the political concern for international competitiveness, there is an ideology which suggests that skilled workers get jobs. This line of reasoning has been criticized. For example Paige *et al.* (1992) has pointed out that it is false to link unemployment to an absence of skills possessed by the individual, rather than to structural aspects of the workplace. There is some truth in this.

It seems, at least in one sense, fruitless to provide individuals with specific vocational skills if there are no jobs available. It is difficult to see how jobs materialize simply from a more educated workforce. Skills shortages may be caused by a number of factors, some concerning the individual and others relating to organizational structures and management practices or social conditions. The point is that the number of students involved in training for specific jobs ought roughly to

be correlated with the number required (perhaps slightly more than required to allow for a competitive edge). This is sometimes hard to achieve when VET courses and apprenticeships may last several years. The teaching profession is a good example where there is an undesirable cycle which swings between excessive numbers (and, hence, many unemployed teachers) and shortages.

Certainly there is equity issues involved in the distribution of work and, if the skills possessed by individuals have anything to do with obtaining employment, then what education and training programmes delivered to individuals is very important ethically. Social inequalities - as an outcome of skills disparity, have been recognized by Vallas (2001) and Gleeson (1995) has drawn attention to the stratification within classes arguing that skilled (Tanzanian) trades people, due to the possession of their skills and tools of trade, take pride in their identity, culture and the benefits which skilled status confers. Gleeson argues that the skilled status of trades people is under threat in post-Fordist workplace reconstruction and that this will lead to a sense of alienation and a significant sense of loss for many workers. Yet questions of equity cannot be easily resolved by looking at what an individual can (or cannot) do at the exit point of this or that training course. This precisely is because of the contextual factors to which Paige *et al.* (1992) draw attention.

Given the varying conceptions, it seems to make some sense to view skills as a relation between certain aspects of the worker and certain aspects of the job which he or she undertakes. Thus, some jobs require a certain level of physical strength, manual dexterity, or the ability to read, or certain kinds of knowledge whether it is viewed as procedural or propositional or of different orders or mixtures of these putative divisions. The educational implications which arise from the different conceptions are important. Teaching the content of jobs seems to be qualitatively different from developing properties of the person in such a way as they can undertake job tasks successfully. As Darrah (2007) points out if skills are conceptualized as depersonalized if not de-contextualized then the education and training of workers is seen as separable from their values, motivations and personality.

Darrah (2007) suggests that the concept of skills as a property of jobs leads irrevocably to the notion that the same set of tasks must be dealt with in identical ways. This kind of view seems to underpin CBT approaches to preparing people for work. Darrah (2007) also points out that this workplace embedded conception of skills leads to the view that changing job requirements can be dealt with simply by training workers in the new skills required. Of course, anyone familiar with workplaces will recognize that change is not so easily achieved.

Skilled workers may attempt to preserve their knowledge and the privileges which arise there from, but, more simply, or more complicatedly, workers may resist change because they do not possess the abilities or rational capacities to cope with such change, particularly when the change required is a shift in direction from one

domain to another. Thus, workers may be unwilling to change because of the emotional factors, but also because of the modes of thought which changed circumstances may require, or because of change to the culture of practice the norms of which have been deeply internalized by individuals. But workers also may be able to change, but have quite industrially legitimate and morally justifiable reasons for resisting change, or refusing to change.

The argument deployed in this paper is that even if this simplistic view of improving workplaces, that is, by reifying and de-contextualising the concept of skills and viewing them as things which can be attached to persons, much as one would put on a shoe, were correct, it still would not be a simple matter to impart new skills. This is because the concept of skills conceptualized as properties of the person generally is still an inadequate explication of the psychological configurations required for successful skill acquisition.

The conception of skills as external (or partly external) to the individual worker does not necessarily lead to educational approaches which reinforce Taylorist approaches to education and training. For example, Ainley (2006) has argued, in line with Gleeson (1995) that skills are not measurable by appeal to individual performance, but must somehow be developed as a part of a culture of skilful practice. Any skill or knowledge is part of a person's *'lived world'*, it gains its meaning partly from the context in which it is learned. It is an error to regard the competence as an isolated mental capacity; divorced from the lived environment itemized competencies demonstrated in the performance of a skill become dissolved in the larger whole of which they are a part.

SKILL ACQUISITION

Dreyfus and Dreyfus (1986) identify five stages of skill development: novice, advanced beginner, competent performer, proficient performer and, finally, expert. This view has drawn criticism. Tomlinson (2008) who argues that rule following an initial procedure in learning skills (which is taken as a characteristic of Dreyfusian theory) is not a necessary (and possibly an undesirable) step, (even rule-following might be a complicated business).

The idea that novices learn skills by following rules has been suggested in different ways in a number of different contexts and has guided teachers and trainers in their approach to the teaching of skills. Reference standard is made, for example, to different styles of supervision, ranging from autocratic to democratic, to a supervisory focus on tasks rather than relations, and to an approach which is highly directive to one which is low in direction. The author's experience in training students suggests that at the novice stage a highly directive approach is generally, though not universally, sought by novice teachers. They need, for example, clear instruction about what to do (how do veterans do it and what policy recommendations would you give?).

As competence increases, however, greater latitude is sought and training, supervisory or mentoring approaches which are characterized by recognition of the learner's autonomy seem more compatible with the development of skilful practice. There is an ethical tension here, of course. Thus, in one sense it is ethically appropriate to adopt different strategies for teaching if they can be justified by their successful outcomes. In a different sense- a non-consequentiality sense - it is always morally dubious to permit an ends-justifying-means argument to hold sway. Yet, it is apparent that at some usually early stages in skills acquisition processes learners are dependent and do seek substantial direction.

Tomlinson (2008) suggests that skill acquisition theory in the 1950s and 1960s was characterized by a three tier approach beginning with a cognitive phase, moving to an associative (or 'motor') phase and concluding with an autonomous phase (Schmidt, 1991) which is also referred to as an 'aromatizing' phase.

According to Schmidt (*ibid*), there are three stages of skill learning and these include verbal-cognitive, motor and autonomous. These stages are categorized in stages. In this case, stage one involves learning what to do, when to do it and what to attend to in doing this or that. It is suggested that verbal and cognitive abilities are dominant at this stage. For stage two, most cognitive problems have been solved and focus shifts toward developing more effective patterns of movement. This stage is characterized by consistent performance, control, increases in confidence, and a concern for task details.

At stage three, the autonomous stage action is automatic. This involves skilled performance, even under trying conditions. In this stage, sensory environmental pattern analysis is automatic with early and accurate identification of response-initiation cues and higher level cognitive skills. In the preparation of teachers and trainers, it is not uncommon to require novices to undertake observations of more experienced individuals with the aim that learning particular skills may begin with noticing what effective practitioners do and, perhaps, attempting to mimic them. This, then, commonly, is followed by practice which in turn is followed by 'feedback', a concept related to, but not the same thing as behaviorist notions of reinforcement. The process is cyclic or spiraling rather than linear. Thus, there is recognition that learners do progress from very little understanding and skill to performances which incorporate increasing complexity of understanding, but it is not a 'lock-step' process.

Focusing on the concerns of learners Fuller (2007), Hall (2001), Blunden and De La Rue (2011) identify three stages of development which render for the learner - curriculum content relevant or irrelevant. These stages are concerns with self; concerns with task; and concerns with the impact of what one is doing. Fuller (2007) traces a more or less sequential path through these stages. However, James (2007) argues that a concerns-based model such as advanced by Fuller (2007) needs reinforcement within frameworks of reflective practice and she emphasizes the

community-based or social aspects of learning (group-work as a means to enhance reflection).

Bereiter and Scardamalia (2007) suggest that skill learning occurs through two main stages: first is 'textbook information', formal knowledge or goals. This is divided into sub-goals which appear attainable. In training motor skills it is quite common to begin with relatively simple skills advancing, at appropriate moments, to more complex skills. Thus some approaches to skills development do seem to break down complex tasks into bits which are then built, bit on bit, into complex performances. This is sometimes referred to as 'bounded rationality' (Bereiter and Scardamalia, 2007). At the level of expertise, complex skills, such as teaching, do seem to subsume 'lower' level bits of cognizance and certain aspects of action seem to become, more or less, sub-conscious through habituation.

Anderson (2009) suggests that skill learning starts out with problem solving; where there are multiple problems (as in novice learning) the mental demand is great, and learners have to draw on existing knowledge as well as acquiring new informal knowledge. Simple procedures become integrated into '*chunks*'. To some extent, then, what is happening in skills acquisition is the shaping of cognitive patterns in ways appropriate for the sort of work which a learner is attempting to do. As has been canvassed above, this usually is done within a culture of work-practice which also functions to press (or repress) cognition in certain ways.

However, hierarchical and pyramidal conceptions of skills as levels ranging from simple to complex, from sensory-motor to abstract conceptualization with each higher level dependent on the sequentially preceding level fails to capture the interwoven, interlaced, interdependent relations which have been suggested in this paper, a position which is closer to a monotonic view than to a tiered view (Fischer, 1980). It should also be noted that skill development at adult levels may be quite different from the accounts which some developmental psychologists provide to explain growth from childhood to maturity. The notion of standards and levels of competence, linked to developmental theories, reinforces a hierarchical concept very much related to the power and remuneration of workers, so, as a structural model normatively applied such standards and levels require strong justification.

Evans (1993) draws attention to the processes of becoming competent stressing the dependency of developing competence on contextual factors and on at least two aspects of the person viz. their values, enthusiasm, understanding of the situation, anticipation of obstacles having appropriate automatic skills and the learning process which they use. Thus, learning processes can differ from one individual to another, at least in the early stages of mastering different modalities of conduct. Indeed, if workplaces, or educational settings in the capacity of workplaces, fail to respond to these preferences then a hegemonic culture already is in place and one which has important implications for the skilling, or the failure to skill Tanzanians workers.

What these brief sketches of learning theory demonstrate is the complex cyclic nature of skills learning and the social interactions which are necessary for effective skills acquisition. Thus, teachers need to give attention to internal aspects of the person, to processes as well as outcomes.

The different theories presented are not discussed in Tanzanian or any other context to show their relevance to practice. Tanzania VET policy is also not given. Here, importance is attached to your claim in the abstract that the paper intends to recommend amending Tanzania VET policy (although the discussion sounds more of curriculum) which is entirely not discussed; at least for comparison of what is and what ought to be purposes!

CONCLUSION

It has not been the purpose of this paper to resolve the many different conceptions of skill, or the theories of their acquisition, though a general tendency toward the psychology of schema theory will be evident (Reason, 2004). However, the complexity of the concept of skill has been stressed along with the complicating theories of skill acquisition. It has been suggested that successful skills acquisition depends not only on certain kinds of mental attributes which infuse meaning into bits of learning but also that seemingly quite unrelated aspects may be crucial in learning technical or professional skills. Personality dimensions, preferred learning styles, self concerns and the nature of character more generally, seem, for example, to be pedagogically important.

This, then, raises the question of whether it is wise for the Tanzania government to so wholeheartedly adopt as indeed it has attempted to do through the various statutory authorities a reductionist, outcomes-orientated, performance based, criterion referenced CBET approach, for a whole system such as the VET sector. Perhaps, after all, there is an unstated political agenda a hidden curriculum driven by economic rationalism. It is tempting to see the shift to 'skills' as part of an attempt to remove a large portion of the teaching and training of young people, from traditional educational institutions and put into the hands of other agencies, which happen to come under a greater degree of control from the government.

The overwhelming support for CBT when its likelihood of '*delivering the goods*' is so uncertain might be seen in an even more fundamentally discouraging political light as class oppression. It is difficult to conceive of a different rationale which might explain the deliberate adoption of a system-wide process of VET which, failing to acknowledge the many complex notions of *skill* and *theories* of skill acquisition has a greater probability of deskilling rather than ensiling, of disempowering rather than empowering Tanzania workers. Yet it seems too facile to appeal to a conspiracy theory of class oppression. The real world is just much more complex and puzzling than such simple reductive ideological explanations allow. And, yet, there is a lingering and insistent moral worry concerned with the justice of a system which sets out to fragment persons and attempts to train just those fragments which obviously can be related to job tasks or industry needs more generally.

It should not be forgotten, however, that the fundamental responsibility of teachers is toward their students. A responsibility which involves not only a concern for what this or that student can do, but also a concern for what they know, with whom they are and the kind of person they aspire to be, or might aspire to be if they knew enough. In any case, enriching courses which have shaved off all but the observable skills of particular tasks and jobs is likely to lay the basis for learners to obtain deeper lying skills and thus lay the foundations for future skills acquisition. This seems an important goal in the context of continual changes in workplace requirements, but what is required in order to achieve it is a kind of Vygotsian shift of perception among VET providers (Vygotsky, 1978; Soden, 2007).

This article began by drawing attention to the substantial commitment to CBT approaches to education and training in Tanzania VET. It has been suggested that the CET approach is pedagogically unsound, whatever it may have contributed to reinvigorating the VET sector in this country and whatever its efficacy might be as a part of the national training reform agenda. As Gonzi (1995) has noticed, the CBET juggernaut is not confined to Tanzania, but is an international movement. Thus, the arguments in this paper, though based on the Tanzania experience, may be generalized. When the philosophical and sociological aspects of training raised in this paper are coupled with the fact that VET providers in general and VET teachers in particular are required to have vocational teacher training qualifications. The fact that about 67% (VETA, 2011) do not have vocational qualifications very worrying scenario emerges.

More likely is a bifurcation where students follow a general education pathway into university or a vocational education pathway into VET. This can hardly be viewed as convergence, though some writers do see the goals of general and vocational education as very similar (Stevenson, 2008). It should be noted that whilst CBT has been the target of criticism in this paper there is no implication that the general educationalists have, by way of contrast, got it right. Indeed, many of the criticisms leveled at the CBT movement could, the necessary changes having been made, be leveled at general education as well. It is important to realize that both general education and VET can be narrowly technical and instrumental with the capacity to vitiate the emancipator potential, what one might call the '*eudaemonic enterprise*', of good education.

Generalist approaches, say at the secondary level, are also susceptible to 'basic skills' curriculum pressure - often justified in terms of 'real world' demands. Some vocational experts also suggest that workplaces are being transformed by the gradual disappearance of 'middle managers' (Parnell, 2007). This scenario has implications for the sort of workers required in a competitive Tanzania workplace and the sort of education and training which is provided for them. There are serious doubts as to whether CBT models of VET alone can adequately prepare future workers for these circumstances. It is partly in recognition of these political and

social changes that the competency debate in Tanzania has shifted from talk about '*competencies*' to talk about '*key competencies*', the latter being generic abilities.

As is noted in several places above, a common response by the defenders of CBT is to argue that what is important is what people can do, rather than what they know. In teaching, this line of defense is often couched in terms of 'relevance'. It has been the concern of this paper to argue against this absurd dichotomy and to suggest that what people can do, and what they are prepared to do, not only as members of a civil society with its liberties and its duties (workplaces are also communities) but also as workers who require specific job-related skills, is crucially dependent on what they know and the way in which what they know is ordered by ethical values (Steadman *et al.*, 1994). There is much about the mind dependence of practical skills which needs to be discovered in order to improve pedagogic practice and increase vocational effectiveness, but it seems, at least to this writer, that the dependency relation mind and skills perhaps also a symmetric relation is fundamental.

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