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What UK graduate employers think they want and what university business schools think they provide

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Abstract: This paper evaluates the increasing focus on the development of students' competencies and skills for management, in university business schools. The debate suggests that deeper understandings, concerning the role of managers are being sacrificed at the hands of an instrumentalist/technicist agenda focusing on competencies and skills. The paper adds to the discussion by scrutinising and applying theory from the literatures of occupational practice, knowledge and learning. Data is presented from sixty four job advertisements stipulating the competencies and skills required of applicants and which illustrate the premium put upon personal practice knowledge. By taking a critical management perspective students can begin to understand the social context and power-based nature of management practice in the workplace. While universities may try to further fulfil the 'narrow', industry-led, competency focus, early indications suggest that universities may possess a good deal of freedom in designing pedagogies supportive of a critical agenda.

Keywords: business schools; skills; competences; knowledge; learning; management practice; employers.

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1 Introduction

This paper evaluates the debate surrounding the increasing focus on the development of students' competencies and skills for management, in university business schools. The debate so far suggests that deeper understandings, concerning both the role of managers and their impact upon the world, are being sacrificed at the hands of an instrumentalist/technicist agenda in which competencies and skills are of prime importance. The paper adds a further contribution to the discussion by scrutinising and applying theory from the literatures of occupational practice, knowledge and learning. The distinction is made between the delivery of prepositional knowledge and students' acquisition of personal practice knowledge. Data is presented from sixty four job advertisements stipulating the competencies and skills required of applicants and which illustrate the premium put upon personal practice knowledge.

We argue that only by taking a critical management perspective can students begin to understand the social context and power-based nature of management practice in the workplace. While universities may extend the design of their management curricula so as to further fulfil the 'narrow', industry-led, competency focus, early indications suggest that universities may possess a good deal of freedom in designing pedagogies supportive of a critical agenda.

2 Background

The increased importance placed upon the teaching and learning of management competencies within the management education curriculum has led some academics to question the validity of this trend. The term 'competences' in this context, is derived from the establishment of shared, explicit standards denoting the generic attributes or properties that might be expected of any Business and Management graduate (MacDonald Ross, 1996). More specifically, the term 'competency' is now generally defined as: "The behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance" (CIPD, 2005). This latter definition, explicitly linking the term 'competency' with the notion of the 'high performance worker', indicates its colonisation as a control mechanism in the workplace.

At their inception during the late-1980s, applications of competency 'frameworks' originally focused mainly on performance management and development, particularly of more senior staff (Boyatsis, 1982). These 'frameworks' have since been widely applied in the UK, for example, by 'Sector Skills Councils' who were prompted to devise wide ranging competence frameworks in their respective occupational areas at up to five levels and to offer 'National Vocational Qualifications' based on these frameworks. Frameworks provide the control mechanism linking individual employees with the organisational imperative to standardise and measure all processes across organisational and geographical boundaries. The further claim that HR-embedded competencies 'reinforce the values of the organisation' is heavily laden with instrumentalist tones. However, despite the promotional message, the 'Factsheet' on competencies of the CIPD (Chartered Institute of Personnel and Development), the lead body for the development human resource management professionals in the UK, presents a list of the criticisms of competency frameworks that far outweighs their benefits.

It is perhaps unsurprising, given the characteristics of competency frameworks outlined above, that Reed and Anthony (1992) presented the spectre of a progressively standardised curriculum in which qualification and accreditation was made possible through the step-by-step acquisition of well-defined types of knowledge and skills, identified as standard 'competencies'. This process has, in the case of the UK, been furthered by the assertion of 'benchmark standards' for business and management education from the UK QAA and this approach has been influential worldwide. Reed and Anthony's study presented an array of competencies and skills including: interpersonal communication, gaining and using power and influence, negotiation, conflict management, goal setting, problem solving and decision making, managing meetings, oral and written presentations, motivating others, coaching and counselling, disciplining employees, team building, time management, stress management and career management. It is worth emphasising the problematic nature of such lists not least because most of these competences are by no means within the remit of the individual to develop - they are virtually all social constructs and whereas motivating others, for example, will be unproblematic in one work situation in another this will be deeply problematic. The call has gone out from within the critical tradition for a reversal, away from the 'narrow vocationalism' which skills training appears to encapsulate, towards ways of developing alternative curricula, organisational cultures, and modes of delivery that stimulate and facilitate a process of active and continuous learning (Salaman and Butler, 1990).

The demands from business organisations for graduates deemed as 'competent', skilled, practitioners points, according to Caproni and Arias (1997, p.295), to a general lack of awareness among managers as to "why they do what they do and the impact that their actions have on others". These authors stress the importance of understanding that managers are not just corporate functionaries - they have other, wider responsibilities as citizens and members of the wider community, adding that doing more of the same, only faster and better, will not help managers address the contextual challenges that they face. They go on to state that skills' training is presented as if the skills were acultural, ahistorical and unrelated to the power relations embedded within organisations and society. The trend towards a standardised curriculum carries further and more wide reaching consequences. Zald (2002), points out that business school education, by focussing its attention on management and organizations, ignores the larger system in which they are embedded. According to Willmott (1994), putting the emphasis upon competencies tends to marginalise more fundamental questions about management as an institution, together with the critical and discursive elements of education that would bring such fundamental questions to the surface.

In this paper, however, we question the view that the increased emphasis upon teaching skills and competences necessarily represents an overly 'narrow' viewpoint. We argue that people need to know different things at different times during their working their lives: some bodies of knowledge are conduits for developing high level vocational cognitive skills, whilst others provide young graduates the means of demonstrating their worth at the early stages of their careers. Furthermore, and in agreement with Willmott, we contend that the problem rests with 'the rise of new or repackaged management thinking [which]

has led to management education being taught within "fiefdoms" - narrowly defined bands related to functions such as HRM, TQM, Marketing and so on (105), and that such fiefdoms serve to conceal pervasive underlying themes such as power and status in society'. We present literatures dealing with the nature of knowledge and knowledge transfer, to support our stance. In addition, we present data showing a wide range of attributes demanded by companies of their graduate recruits.

3 Knowledge acquisition and use

To better understand employers' perceptions that new graduates in business and management subjects fall short of their requirements, it is necessary to scrutinise the nature of occupational practice, knowledge and learning. The past decade has seen continued growth in formal business education for labour market entrants in the UK through the expansion and further proliferation of bachelors and foundation degrees. The direct utility of these business degrees and vocational degrees in general is, however, as this paper will show, predicated on certain questionable assumptions.

All vocational educational provision is based on an assumption of 'transfer' (Greeno et al., 1996). Transfer is a process whereby knowledge or skill learnt in one context can be used in another context. The extensive literatures distinguish between 'near' and 'far' transfer, on the basis of the similarity or dissimilarity of the contexts of acquisition and of application. Thus 'near' transfer occurs when, for example, a pilot applies her flight simulator training in her actual flying. By contrast, for a student to apply, say, the '4 Ps' of the marketing curriculum learnt in the business school to the running of an actual business, requires a process of 'far' transfer. Needless to say, in this latter case transfer is attenuated, at best partial, and considerably more challenging to accomplish.

In terms of the influential typology of levels of knowledge use identified by Broudy et al. in the 1960s (see Eraut, 1994), far transfer involves complex higher-level processes of interpretive or associative knowledge use. Business educators appear nonetheless to assume, that transfer is straightforward and thus that the lowest, replicative level of knowledge use will be effected by learners. Transfer has, however, to be regarded as 'very problematic' (Evans, 2002) whilst far transfer in particular is 'extremely difficult to produce' (Hendricks, 2001, p.308). An extensive body of research demonstrates that the knowledge associated with formal education settings fails to transfer to settings of knowledge use beyond the academy. A number of empirical studies have found that barely more than ten percent, of even highly job-specific formal training, involving near transfer, is applied by learners in their practice (see Detterman, 1992; Billett, 1994). Sternberg and French's (1992, p.25) review of the transfer literature prompted their conclusion that transfer from vocational education to practice was the 'exception rather than the rule'.

Business educators working with full-time students have attempted to promote transfer through the use of pedagogies such as case studies and corporate research projects. While such pedagogies provide a degree of authenticity to the educational experience (Stevenson, 1994, p.65), they are criticised for their

artificiality. Walkerdine (1997, p.68), for example, notes that very partial or even fictitious views of the 'real world' are typically presented. However, as Grey and Mitev (1995) observe, students have learned to demand management education that is 'useful', 'practical' and 'relevant' to the 'real world'. This attitude places a premium on learning techniques. The term 'real world' is used to refer to the world of work and denotes a mythical separation from that embodied by academic knowledge and reasoning. It assumes that work functionaries all inhabit the one world with a uniform worldview whilst promoting the view that management education stands in a functional relationship to management itself (Grey and Mitev, 1995, p.74).

The failure of knowledge acquired through formal education to transfer to practice, regardless of the pedagogies of simulation and application, can be understood firstly, in terms of flawed assumptions about the nature of practice. A 'technical-rationalist' assumption of practice dominates educators' thinking. Practice in graduate jobs is thus assumed to involve the more or less direct application of the explicit theories and principles, which are centred in undergraduate education. It is assumed that graduates' work will involve 'high ground' tasks such as research and policy formulation. There is evidence that such 'high ground' tasks do draw directly upon propositional knowledge. The reality of work for most newly appointed business graduates in the contemporary context of mass graduation from higher education is, however, perhaps better characterised as practice in the 'swampy lowlands' of organisations (Schön, 1984, p.6). Such practice involves not the knowledge of business theories and principles but knowledge and, particularly skills, for problem solving and judgement and, most importantly, an orientation to learning from experience. Transfer failure can thus, secondly, be understood through an appreciation of the knowledge forms of formal education and of organisational practice. While recognising the artificiality of classification, it is analytically useful to distinguish forms of knowledge and Blackler's (1995) typology of five forms of occupational knowledge is widely cited. An understanding of the degree of alignment between graduates' capabilities and employers' requirements, however, requires that just two distinct forms of knowledge be differentiated.

The form of knowledge 'delivered' through university education is labelled public or propositional knowledge or 'know that' (Eraut, 1994, p.17). Such knowledge meets the everyday criteria of academic knowledge being scientifically produced, accumulated and validated by a professional research community. The knowledge is de-contextualised, and is thereby assumed to be generalisable. From the perspective of practice, however, propositional knowledge is criticised as knowledge *of* practice rather than knowledge *for* practice. Lave and Wenger (1991, p.108) thus assert that while such knowledge has come to have considerable 'exchange value', its 'use value' is questionable.

Newcomers are found to practice in 'rule bound' ways, conceptualising business problems, for example, in terms of 'correct' solutions (Schön, 1984, p.345). Certain routine business activities are based on this particular knowledge form and, by contrast, an understanding of theory and principles might inform the higher-level activities graduates will engage in later in their careers (Claxton, 1997). We are led to conclude therefore, that propositional knowledge provides

only marginal impact upon practice itself, and little or nothing for understanding the context of practice.

Propositional knowledge is, therefore, useful only as a vehicle for developing the generic cognitive skills such as data search, problem solving and intra and inter personal skills such as communicating (including empathetic listening to facilitate appreciation of context), working with others, judgement, analysis, synthesis, critical evaluation etc. - all prima facie important in UK business education but usually subservient to propositional knowledge transfer and reproduction. Thus, an individual's knowledge of a subject like corporate strategy is likely to contribute only marginally to their workplace effectiveness. However, the processes of acquiring and working with that knowledge as a part of formal business education may well enable the individual to develop cognitive and inter-personal skills, such as those of problem solving and team working that are of direct utility in the workplace context. Furthermore, from a critical perspective, the student of business might be served most effectively in their practice through developing the skills of critique and an understanding of the power imbalances in society.

However, in contrast to certain professions, the roles occupied by new business graduates are likely, as noted, to be neither totally routine nor higher level and will thus require, in part at least, a different form of knowledge. This contrasting and distinct knowledge form is typically labelled personal, practice or procedural knowledge. Such knowledge is non-linear, holistic, integrated, only partly organised and 'imbued with personal meaning' (Elbaz, 1983, p. 19). Propositional knowledge and practice knowledge are to some extent interrelated, the former enabling generation of the latter and the latter facilitating the application of the former. Even in the case of occupations with substantial codified prepositional knowledge bases such as medicine, however, accomplished occupational practice is found to be largely grounded in personal knowledge (Patel and Rocha, 1999, pp.75-76).

The tacit nature of practice knowledge implies that it is not amenable to formal or informal instruction but is, rather, developed largely through personal work experience (Darrah, 1996; Sternberg, 1999). Education for practicing managers, such as MBA provision, has increasingly acknowledged the significance of practice knowledge, albeit from a low base. This provision has thus typically adopted pedagogies such as reflective practice and action learning to enable learners to develop this knowledge in more systematic ways.

Pedagogies to develop personal knowledge from practice have limited applicability, however, to undergraduate business education where students typically have only limited work experience upon which to draw. Nonetheless, undergraduate business education has migrated to some extent from emphasising knowledge delivery to emphasising the development of generic cognitive abilities such as logical thinking and problem solving. This migration acknowledges, in part, graduate employers' views that graduates of non-vocational degrees such as, for example, languages and pure sciences, have developed exactly the thinking skills needed for success in business roles. These ways of thinking, or 'knowing', appear to have considerably more transference from the academy to work contexts than knowledge of specific business theories

and principles. It is suggested that such knowing skills are particularly effective in practice as they equip the learner for continuous learning from experience (Resnick, 1988).

There is, however, a final, consideration as to why universities may be unable to prepare graduates adequately for business practice. A considerable body of situated cognition theorising has emerged over the past decade and this theorising finds that knowing also has limited transference. Knowing, it is suggested, is 'interwoven' with 'systems of relations' and, is thus 'mutually constructed' (Lave, 1997; Corley and Eades, 2002). These writers argue that generic knowing skills do not transfer out of the seminar-room because such skills are embedded within the seminar-room and its social systems (see Pea, 1993) or, as Wenger (1988, p.267) asserts, "school learning is just learning school". Stevenson (2002) thus suggests that 'situated cognition' theorising has "displaced" debate regarding transfer (4). The knowing of practice is therefore conceptualised as socially and physically distributed among the participants enacting the practice and within the artefacts of their practice.

The demands from business organisations for graduates deemed as 'competent' skills-practitioners, perhaps highlights the 'tension' within business schools "...between the ideals of a classical pedagogy, in which knowledge and learning are ideals in themselves and the demands of government and business for utilitarian relevance (Cunliffe et al., 2002, p.489). This tension may stem from the 'morally suspect view' (Zald, 2002, p.367) that one of the prime goals of business schools is to promote the profit-making capacity of the firm. This view, also held by many mainstream business academics, leads to business school education focussing its attention on management and organizations and not the larger system in which they are embedded. Grey and Mitev (1995) argue that this mainstream conception of management education is to improve the managerial competence of students for instrumental reasons of control; an argument that may be considered as validated by the CIPD definition of 'competency' provided at the start of this paper.

4 Data collection

Advertisements for graduate level jobs were scrutinized for the competencies, personal qualities and skills which applicants were required to possess. A total of 64 advertisements were chosen, representing a range of public and private sector organisations from small to medium sized enterprises to large national and international companies. The *Times* newspaper (20th April 2006) was chosen due to its standing as a leading UK medium for graduate recruitment. Job advertisements on Internet recruitment sites as well as on individual company's websites were also chosen. Convenience sampling was used in the choice of media, although roughly approximate proportions of advertisements were examined according to the type of organisation (above). This sampling method is considered to be appropriate for preliminary research of this type where the researcher is interested in gathering inexpensive data.

All advertisements asked applicants to submit *curriculum vitae* outlining

qualifications and demonstrating the competencies required as stated in the advertisement. Where no competencies were highlighted or competencies were in some way unclear an email was sent to the company for clarification. For example, the terms 'knowledge', 'initiative' and 'commitment' in particular, needed clarification as companies clearly applied wide ranging definitions to each. We therefore present the terms as described to us by the companies involved. Nineteen discrete competencies emerged (see right hand column of Table 1). Where a term was considered to be sufficiently ambiguous or broad, an email was sent to the advertiser asking for further explanation for the term's meaning. Clearly, different competencies are required for different jobs. But it is also the case that companies in different industrial sectors, such as a bank and a manufacturing concern, will require a different array of competencies. In order to provide structure for analysis, and to make sense of the diverse terms and meanings used to describe competencies, a framework, compiled by the US Departments of Labor and Education, was adopted for its clear and concise exposition of these complex notions. The 'Secretary's Commission on Achieving Necessary Skills' (SCANS) (2000), framework categorises the kinds of competencies and skills "that workers must have to succeed in today's workplace" (see Appendix). The study compiled three main categories: competencies, personal qualities and skills to cover the range of human behaviours, attributes and capabilities. Several sub-categories provide specific descriptors of each of the main categories: also presented in the first column of Table 1.

Table 1   Analysis of competencies sought in sample

Cluster	% No. of mentions	Competence cited in advertisement (its meaning [where not obvious] according to the advertiser in notes below)
Competency 1: Resources	26	Organisation
Competency 2: Inter-personal	49	Teamwork
	44	Communication
	8	Diversity, Inclusion
	41	Leadership
Competency 3: Information	0	
Competency 4: Technology	28	Knowledge(1)
Competency 5: Understands complex relationships	25	Work experience
	28	Commercially aware
	4	Business development skills
Personal Qualities	66	Commitment(2)
	6	Honesty/integrity
	23	Personal development
Skills 1: Thinking skills	64	Initiative(3)
	48	Creativity
	45	Problem solving
	10	Language skills
	6	Intellectual ability
	5	Common sense
Skills 2: Basic skills	5	Numeracy

Notes:
(1) "Unspecified technical/specialist skills, IT, specified degree subject, understands the business, financial awareness, strong technical skills in their own discipline, supply chain planning principles, understanding of environment in which consumer policy is developed, understanding of regulatory and consumer policy."
(2)"Willingness to work hard, resilient, passion, motivated, energy, drive."
(3)"Decision making, confidence, exceeding performance goals, enjoy challenge, ambitious, ability to work alone, self sufficient, enthusiastic, dynamic, flexible."

5 Findings and discussion

The survey data in the right hand column of Table 1, illustrates the wide array of competencies required from applicants, ranging from low to high-order cognitive skills, personal attributes, behaviours and abilities. The sheer range of terms found in the data to describe 'competencies' leads us to conclude that employers have high expectations, both of their new entrants and of business schools in preparing people for the workplace. However, the list is so extensive and the terms so open to interpretation that, rather than leading business schools towards a 'narrowly vocational' curriculum, we contend that there is much scope for business schools to engage in alternative pedagogies.

From the data in Table 1, we observe immediately that none of the companies surveyed included a requirement under the heading 'Information' as used by SCANS possibly because SCANS conceive of 'information' as an object, as knowledge, rather than a process. Rather than discard this point as an anomaly, we consider it to be an important indicator of the confusion surrounding the whole 'competency' initiative, for how can performance be measured (rewarded or punished), if the measure is not adequately defined? Similar confusion abounds around the use of the term 'knowledge', which pertains to three of the competencies defined by SCANS - 'Interpersonal', 'Systems' and 'Technology'.

However, the 'SCANS' list of competencies, personal qualities and skills in Table 1, has a clear resonance with companies surveyed in this study. Furthermore, they emphasise an orientation towards *action* on the part of the graduate applicant. This orientation stresses the 'near' transfer from education to practice, such that more, rather than less emphasis is needed on the cognitive, intra-personal and inter-personal skills, which certain approaches to business education do emphasise. The data in Table 1 indicates in particular, that competencies such as commitment, initiative, communication, teamwork, problem solving and creativity rank very highly with employers. Discussion with different university careers officers suggests that *graduate employers typically seek the generic skills/competences that are incidental to the explicit curriculum of any particular subject*. There is, however, a clear preference for graduates of subjects that are perceived to be intellectually demanding such as sciences, languages and law which, it is believed, require students to develop these generic skills/competences, and, not least, an orientation to hard work and commitment. We do not consider, either from a pedagogic or philosophical viewpoint, that the teaching of such 'near' knowledge to be problematic; indeed most of the skills/competencies listed can be learned by 'critical' examination. For example, a contextual examination of distorted communication can be accomplished through practicing multi-nodal communications, thus combining prepositional and practice knowledge. Similarly, the restrictive nature of organisational decision-making can be opened to analysis by simulating creativity within a rule bound environment. Personal qualities such as commitment, integrity and honesty can be 'taught' with reference to neo-classical texts or for example, A.C. Grayling's "*What is Good?*" (2003) or Steven Covey's "*The 8 Habits of Highly Effective People*" (2004).

We contend that the problem of 'narrow vocationalism' lies, not with the teaching of competencies, but within the 'silos' of prepositional knowledge. Beyond the argument that business subjects perhaps provide novices' with some degree of confidence and a basic understanding of what appears to be 'going on' and of the language that practitioners use, there is little of the direct transfer that is typically assumed by the unquestioning academic.

The literature discussed above on knowing and acquisition, suggests that only by participation in practice, will newcomers appropriate the knowing and knowledge situated within a workplace. Ways of knowing and working are unique to each workplace being strongly situated and sustained through various participatory learning processes (Warhurst, 2007). In this perspective the workplace power structures in which ways of knowing and doing are embedded, are brought into focus (Gherardi, 2000). The constraints on graduates' actions, informed by their studies, are clearly apparent when such networks are examined. The limits to the agency of newcomers in a workplace, thus highlights a final, flawed assumption predicating the edifice of current business education. Indeed it appears from the rhetoric extolling the virtues of competency frameworks that this limitation will apply across organisations, as the pursuit of the yet vaguely defined term 'performance' increases.

Given the limitations of undergraduate business education in preparing graduates for practice, the question arises as to how such education might become more effective in meeting employers' needs. Firstly, developing in students the ability to learn *in situ*, to quickly appropriate established ways of thinking and working, should become a key target for business educators. A second target for educators should be the development of students' 'knowledge implementation skills', to enable the transformation and 're-situation' of knowledge and knowing between contexts (Eraut, 2003). In these ways, tomorrow's graduates will be sensitised to established, socially situated, workplace practices and enabled to extend such practices in contextually appropriate and acceptable ways.

The practical question still remains as how this knowledge transformation can be facilitated within the educational setting when the bulk of business school curricula remain concerned with delivering prepositional knowledge in the form of the 'usual suspects': subjects such as HRM, Organisational Behaviour and Operational Management. The role of competencies, personal qualities and skills discussed here are important for individuals as well as for organisations, but not as disembodied and objectified entities presented in the form of a menu.

6   Conclusion

In their eagerness to adopt competency frameworks, organisations have omitted an important stage in the adoption process. Most do not know what the term 'competency' means. Rather than acknowledge its philosophical, psychological and sociological complexities, managers and commentators, (HR practitioners and consultants in particular), have launched into a reductionist process, thus denuding the concept of meaning or value. The aim of objectifying performance through measurable competencies is dubious within a post-industrial landscape.

However, we should clearly differentiate the development of embedded personal competencies from the delivery of basic skills training and their associated instrumentalist measurement processes.

Following Capra (2003), we would propose a pedagogy based upon systems rather than disintegrated subjects. Capra urges attempts to understand organisations in terms of living systems: of nonlinear networks, which help students to deal with the complexity of rapid change. This approach will, in turn, imbue a concept of sustainability "since the principles of organisation of eco-systems ...are identical to ...all living systems..."(p.88).

We anticipate a curriculum that embraces what the artist Robert Irwin (Boland and Collopy, 2004, p.41) called "compounded abstraction", to describe the progression that is involved when people try to make sense of the world. Such a curriculum would facilitate the learning of many of the competencies presented in Table 1, whilst breaking down subject silos. The concept of the business organisation, represented as a formalised and reified mechanism for efficiency and effectiveness, would be replaced with a perception of a living system in which the organisation exists. This proposal may, at first glance, be considered as a softer option than, for instance, Giddens' (1991) call for 'radical engagement'. However, we wish to remove the burden of challenging the dominant business school orthodoxy (Willmott, 1994) from individual academics' shoulders, by positioning an inherently critical curriculum at the core of the curriculum. In so doing we provide a response to Caproni and Arias (1997, p.294) in their call for a systems approach to 'broaden the students' worldview' and, in so doing, entice the two elements of critical, emancipatory education (Giroux, 1992) into general existence - the 'language of critique' together with the 'language of possibility' (in Reynolds, 1998, p.188). Thus, students would enter the workplace as both competent and critical practitioners and as powerful agents-for-change.

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Appendix

Table 1   SCANS' Five Competencies

Resources: Identifies, organizes, plans, and allocates resources
- *Time* - selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules
- *Money* - uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- *Material and facilities* - acquires, stores, allocates, and uses materials or space efficiently
- *Human resources* - assesses skills and distributes work accordingly, evaluates performance and provides feedback

Interpersonal: Works with others
- *Participates as member of a team* - contributes to group effort
- *Teaches others new skills*
- *Services clients/customers* - works to satisfy customers expectations
- *Exercises leadership* - communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies
- *Negotiates* - works toward agreements involving exchange of resources, resolves divergent interests
- *Works with diversity* - works well with men and women from diverse backgrounds

Information: Acquires and evaluates information
- *Acquires and evaluates information*
- *Organizes and maintains information*
- *Interprets and communicates information*
- *Uses computers to process information*

Systems: Understands complex interrelationships
- *Understands systems* - knows how social, organizational, and technological systems work and operates effectively with them
- *Monitors and corrects performance* - distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems performance and corrects malfunctions
- *Improves or designs systems* - suggests modifications to existing systems and develops new or alternative systems to improve performance

Technology: Works with a variety of technologies
- *Selects technology* - chooses procedures, tools, or equipment including computers and related technologies
- *Applies technology to task* - understands intent and proper procedures for setup and operation of equipment
- *Maintains and troubleshoots equipment* - prevents, identifies, or solves problems with equipment, including computers and other technologies

Appendix (continued)

Table 2   A Three-Part Foundation of SCANS Skills and Personal Qualities

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks
- *Reading* - locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules
- *Writing* - communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts
- *Arithmetic/mathematics* - performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques
- *Listening* — receives, attends to, interprets, and responds to verbal messages and other cues
- *Speaking* - organizes ideas and communicates orally

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons
- *Creative thinking* - generates new ideas
- *Decision making* - specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternatives
- *Problem solving* - recognizes problems and devises and implements plan of action
- *Visualizing* - organizes and processes symbols
- *Knowing how to learn* - uses efficient learning techniques to acquire and apply new knowledge and skills
- *Reasoning* - discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

Personal Qualities: Responsibility, self-esteem, sociability, self-management, integrity, and honesty
- *Responsibility* - exerts a high level of effort and perseveres towards goal attainment
- *Self-esteem* - believes in own self-worth and maintains a positive view of self
- *Sociability* - demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings
- *Self-management* - assesses self accurately, sets personal goals, monitors progress, and exhibits self-control
- *Integrity/honesty* - chooses ethical courses of action