

Dispositional and maturational development through a competency-based training intervention: getting to the heart of the matter

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Abstract

Presents a formative perspective on vocational learning that proposes that vocational competence is dependent upon dispositional development, which in turn results in moves towards maturation. Further, that dispositional and maturational outcomes occur as a result of a lifetime goal-setting intervention employed prior to training. Reports qualitative and quantitative research with unemployed adults engaging in vocational education that resulted in four findings. Firstly, that while Training Packages describe assessable outcomes in competency-referenced terms, trainees describe learning outcomes in non-competency referenced terms. Secondly, that vocational trainees describe their learning in terms of dispositional outcomes, that is, in terms of values, interests and attitudes. Thirdly, that dispositions can be categorised in terms of maturational concepts. Fourthly, in support of incremental theory, that trainees made moves towards maturation as a result of a lifetime goal-setting intervention employed prior to training.

Introduction

In Australia, the delivery mechanism used to deliver vocational training is labelled competency-based training (CBT). Despite extensive use of CBT little empirical research has been undertaken on its consequences for many of the stakeholders involved (James 2001) and few evaluative studies have investigated the degree to which CBT achieves its stated aims and objectives (Harris 1996). In particular, there is little published research on the outcomes and benefits for individuals; and, a paucity of research which uses the views of the participants involved in vocational training. As well, although Billet (2001) published strategies for effective workplace-based vocational learning, less research has been published on classroom-delivered vocational education using CBT. The present research addresses those needs, and in the face of much criticism of CBT, considers the effectiveness of classroom-delivered CBT as a delivery methodology for vocational training.

The underlying theme of the research is intra-individual change (Bandura 1991) and the malleability of human attributes. The question addressed is: are human attributes static and unchangeable as suggested by entity theory, or dynamic and malleable as argued by incremental theory (Dweck 1996). The research follows on from Mulcahy (2000) who notes that CBT used to deliver vocational training in Australia has become a platform for a number of different models of training in which the success of CBT 'appears to rely heavily upon the expertise and professional judgement of practitioners, in reinterpreting and supplementing the standard training programme where necessary' (James 2001, p. 320). Similarly, Salas and Cannon-Bowers (2001) note that considerable research has been conducted into the factors which assist trainees to optimise the benefits of training with the finding that these factors are usually interventions employed before training. The training supplement reported in this paper is a pre-training intervention labelled lifetime goal-setting. In the present research, quantitative results for the treatment group who received the lifetime goal-setting intervention prior to training showed significant moves towards maturation while the group not exposed to the pre-training intervention made lesser and non-significant moves towards maturation.

As a result of both the quantitative and qualitative findings, the researcher presents a formative perspective on vocational learning which proposes that vocational competence is dependent upon dispositional development, which in turn, results in moves towards maturation. Further, that moves towards dispositional and maturational development are increased as a result of the goal-setting intervention prior to training. Due to publishing constraints, the paper opens with an extremely brief and selective overview of the relevant literature followed by the research methods, findings and discussion.

Relevant literature

Workplace knowledge and vocational competence

An important feature of a successful enterprise is to have employees who can effectively perform relevant vocational tasks. For this reason, employers are interested in identifying the source of individual high levels of competent performance (Billett 2001). Cognitive theorists propose that individual knowledge, the basis for

competence, resides in memory. In addition, that vocational knowledge exists in different forms described as cognitive structures. Billett (2001) identifies three forms of cognitive structures. First, conceptual forms of knowledge comprised of facts, information, propositions, assertions and concepts (Billett 2001). Conceptual knowledge is also referred to as propositional knowledge (Billett 2001), declarative knowledge (Anderson 1982), and ‘knowledge that’ (Billett 2001, p. 51). Second, procedural forms of knowledge. This is the knowledge individuals use to act and is referred to as ‘know how’ (Anderson 1982). ‘Know how’ comprises the techniques, skills and abilities needed to secure goals (Stevenson 1994).

Billett (2001) argues that conceptual and procedural knowledge determines competence; but, Billett also suggests that these structures do not fully explain vocational behaviours. For example, it can be asked how the caring and attentive behaviours of a pharmacist towards clients can be explained above the expected conceptual and procedural knowledge needed to fill prescriptions. Hence, the third form of cognitive structure is argued to be dispositional knowledge which underpins conceptual and procedural knowledge (Billett 2001). Dispositions are comprised of vocationally related attitudes, values, affect, interests and identity (Prawat 1989) and in motivational theory, dispositions account for the disparity between what individuals are capable of doing and what they actually do (Dweck & Elliott 1983). Further, Perkins, Jay and Tishman (1993) regard dispositions as individual tendencies to put capabilities into action. Dispositions also fall into the category of vocational attributes which include a variety of generic, key and employability skills as well as other qualities and attitudes (OVAL Research Working Paper 03-12 2003, p. 3).

Dimensions of maturation

Knowles (1990) argues that as individuals mature, their need and capacity to be self-directing and their need to organise their learning around life problems steadily increases in the period from infancy to pre-adolescence; and, rapidly increases during adolescence: ‘the need to be increasingly self-directing continues to develop organically’ (Knowles 1990, p. 55). In fact, researchers studying healthy adult development now assume maturation continues throughout the life span (Levinson 1986). Following leads from psychological literature on adult maturation Knowles nominates a list of critical dimensions considered to be associated with the processes of individual maturation:

FROM	TOWARD
Dependence	Autonomy
Passivity	Activity
Subjectivity	Objectivity
Ignorance	Enlightenment
Small abilities	Large abilities
Few responsibilities	Many responsibilities
Narrow interests	Broad interests
Selfishness	Altruism
Self-rejection	Self-acceptance
Amorphous self-identity	Integrated self-identity
Focus on particulars	Focus on principles
Superficial concerns	Deep concerns
Imitation	Originality
Need for certainty	Tolerance for ambiguity
Impulsiveness	Rationality

Figure 1: Dimensions of maturation (Knowles 1996, p. 29).

Knowles argues that for young children, the dimensions on the left-hand side of the scale are appropriately descriptive; and, that as maturity develops there is a move towards the dimensions on the right-hand side of the scale. Further, that the dimensions describe directions of growth, not absolute states to be achieved. An implication of Knowles' multidimensional theory of maturation is that every educational activity can provide maturation opportunities for each individual in several dimensions since dimensions of maturation are interdependent (Knowles 1996). In the movement from childhood dependence towards adult autonomy Knowles (1996) claims that every experience that moves an individual away from dependence is educational. Thus to be effective in learning, one of the roles of adult educators is to remove student dependence on teachers. Heath (1977, p. 41) argues that 'to further a person's competence, one should find ways to enhance his (sic) maturity.'

Goal-setting theory

A common view disseminated by contemporary personality theorists is that human behaviour is organised around the pursuit of goals (Bandura 2001; Elliott & Dweck 1988; Pervin 1989). Also, a growing body of research in cognitive science, psychology and education supports the view that learning is largely a goal-directed process. As well, the operation of goals continues to be a central concern in motivation theory (Appelbaum and Hare 1996).

Goal setting is defined as a 'desirable state of future affairs one intends to attain through action' (Kruglanski 1996, p. 599). Similarly, goal constructs are defined as representations of future states accompanied by desire or affect (Pervin 1989). Other theorists use terms that undoubtedly refer to goals, for example: personal strivings (Emmons 1986), personal projects (Little 1983), current concerns (Klinger 1975), possible selves (Markus & Nurius 1986), self guides (Higgins 1996), visualised futurities (Bandura 1991), life mission (Kroth & Boverie 2000), personal strivings (Emmons 1986), life tasks (Cantor & Kihlstrom 1987), and goal orientation: 'the mental framework used by individuals to interpret and behave in learning- or achievement-oriented activities' (Salas & Cannon-Bowers 2001: 479). Regardless of the term used, all goal terms are built on the foundational idea that goals direct and energise behavioural and attitudinal activities through the provision of meaning for actions and lives. Hewitt (1995, p. 165) noted: 'Goal setting is very important when instructing adults. Adult learners are better able to state how they learn and are more aware of what their learning needs are.'

The importance of goal setting to life outcomes is illustrated by the finding that apart from simple ability, and sometimes luck, the most important determinant for success in life is self-management (Baumeister 1996, p. 37). Baumeister, Heatherton and Tice (1993) found that two people may have similar intelligence and abilities but one may achieve far greater success in life by setting goals effectively and ensuring that they are achieved. As well, goal-setting is similar to opportunity centred learning (Rae 2003, p. 542) in which 'people recognise their world as an opportunity-rich environment, in which they face the constant challenge of investigating, making sense

of, selecting and acting on opportunities.’ A view on why goal-setting works comes from the German action-theory oriented approach to human motivation of Gollwitzer (1996) who argues that planning helps to alleviate crucial volitional problems of goal-achievement, such as being easily distracted or giving up in the face of difficulties.

Lifetime goal-setting

A qualitative exploratory study by Kroth and Boverie (2000) suggests that adult educators can improve learning processes by providing means for learners to understand their life mission and how it relates to their own learning. Also that life mission explication can support a change in learning experience from being teacher-directed towards being student-directed. Importantly, Kroth and Boverie argue that the stronger and more focussed a person's life mission, the stronger and more focussed the learner's self direction. Further, that life directions provide the focus for learning and the motivation to pursue it (Kroth & Boverie 2000, p. 143).

Research reveals that individuals can derive additional volitional benefits from planning as a result of the '*implemental mind-set*' (Gollwitzer 1996, p. 307). In Gollwitzer's (1996) view, mind-sets are general cognitive orientations towards problem solving that enable individuals to plan executable behaviours that are stable and generalise across situations. In Gollwitzer's view, mind-sets lead to efficient goal achievement. Meichenbaum and Biemiller (1998, p. 148) argue that when students are goal-oriented they are 'much more likely to engage in deliberate practice, to intentionally plan and self-monitor their performance, and to persist in the face of failure and frustration.'

Qualitative research method and findings

One-to-one interviews and two semi-structured focus groups were conducted over the research period. The focus of investigation was to identify participants' perceptions of their competency learning outcomes. The one-to-one interviews were tape-recorded and later transcribed for analysis. During focus groups, as individual trainees vocalised perceptions of their competency learning outcomes the researcher wrote key words or sentences describing outcomes onto butcher-paper. Then, the group was asked how many of them in the group felt that they had achieved similar outcomes. In this way, trainee competency outcomes, expressed in their own terms, were able to be totalled for analysis.

Analysis of the transcribed recordings and researcher' notes from the focus group discussions revealed that trainee competency outcomes could be classified under the three general dispositional headings suggested by Billett (1997) based on work by Nunnally (1967): values, interests and attitudes. Nunnally defined values as life goals and ways of life; interests as preferences for particular activities; and, attitudes as positive or negative feelings about things.

While classroom delivered vocational training typically delivers technical skills, knowledge and concepts, with an emphasis on the development of cognitive skills (DfEE 1996) and provides the basic building blocks of competence for intending workers (Dymock & Gerber 2002), trainees in this research described the outcomes of their training in quite different terms. Trainees described the outcomes of their

vocational training in non-competency referenced terms that were dispositional in nature. The importance of dispositional skills to the actual performance of vocational skills should not be underestimated since Billett (1997, p. 5) argues that ‘both the conscious and unconscious deployment of concepts and procedures have dispositional underpinnings.’

Further analysis of the qualitative results revealed that the dispositional outcomes described by trainees could also be categorised in relation to Knowles (1970) dimensions of maturation. In the figure below, trainee non-competency referenced dispositional responses appear in regular font with an appropriate maturational dimension underneath in ***Bold Italics***. The figures in parenthesis represent the number of times a non-competency referenced outcome was reported by participants.

VALUES	INTERESTS	ATTITUDES
increased capacity for planning and goal-setting (35) <i>Dependence towards Autonomy</i>	an increased interest in customer-service orientations (27) <i>Selfishness towards Altruism</i>	increased confidence (37) <i>Self-rejection towards Self-acceptance</i>
a more determined stance (23) <i>Superficial concerns towards Deep concerns</i>	increased interest in health and education (24) <i>Narrow interests towards Broad interests</i>	feeling more positive (32) <i>Self-rejection towards Self-acceptance</i>
a increased focus towards ethics and the environment (17) <i>Narrow interests towards Broad interests</i>	more interest in state and federal government issues and initiatives (19) <i>Narrow interests towards Broad interests narrow</i>	more considered approach to decisions and actions (32) <i>Impulsiveness towards Rationality</i>
fairness in dealing with others (11) <i>Selfishness towards Altruism</i>	less interest in watching television and more interest in reading about business (13) <i>Narrow interests towards Broad interests</i>	improved concept of self (28) <i>Self-rejection towards Self-acceptance</i>
more willing to take on additional responsibilities and accept personal responsibility for actions (11) <i>Few responsibilities towards Many responsibilities</i>	a more balanced view towards family, business and further education (11) <i>Narrow interests towards Broad interests</i>	feeling more enthusiastic (23) <i>Self-rejection towards Self-acceptance</i>
honesty in dealing with others (9) <i>Selfishness towards Altruism</i>	more interest in stockmarket activities (8) <i>Narrow interests towards Broad interests</i>	increased independence (21) <i>Dependence towards Autonomy</i>
a willingness to more positively consider empirical evidence rather than anecdotal data (5) <i>Subjectivity towards Objectivity</i> <i>Focus on particulars towards Focus on principles</i>		increased activity (18) <i>Passivity towards Activity</i>
		being a better listener (17)
		developing more reliability (16) <i>Dependence towards Autonomy</i>
		more disciplined (16) <i>Dependence towards Autonomy</i>
		being less critical of others (13)
		capable of being organised (11) <i>Dependence towards Autonomy</i>
		better idea of who I am and my place in the world (9) <i>Amorphous self-identity towards Integrated self-identity</i>
		more tolerance of situations that are not clear cut (7) <i>Need for certainty towards Tolerance of ambiguity</i>
		being more considerate (6) <i>Selfishness towards Altruism</i>

Figure 2: Classification and frequency of trainee’ dispositional responses categorised in relation to Knowles dimensions of maturation.

The qualitative research resulted in three findings. First, that while Training Packages describe assessable outcomes in competency-referenced terms, trainees describe learning outcomes in non-competency referenced terms. Second, qualitative data

revealed that vocational trainees describe their learning in terms of dispositional outcomes; that is, in terms of values, interests and attitudes. Third, that for analytical purposes, dispositions can be categorised in terms of maturational concepts.

Quantitative research method and findings

To explore the extent of moves towards maturation as a non-competency referenced outcome of CBT methodology and the lifetime goal-setting intervention prior to training, the researcher adapted Knowles' (1970) dimensions of maturation (DOMS) in three ways so that trainees could self-assess each dimension. Firstly, each dimension of maturation was worded in first-person to enable it to be understood by a broad range of trainees. Secondly, the dimension 'amorphous to integrated self-identity' in Knowles original scale was omitted since it was considered to be too difficult a concept for trainees to self-evaluate. Thirdly, dimensions 4, 5, 8, 9, 10, 12 and 14 were reverse ordered to reduce respondent cheating. The adapted (DOMS) which was presented to trainees for self-completion prior to, and following course completion appears below in Figure 3:

1.	I tend to be dependent; that is, I rely on others for income and/or making decisions and/or taking action.										I tend not to be dependent on others for income and/or making decisions and/or taking action.
2.	I tend to be passive. I do little physical and/or mental exercise.										I tend to be active physically and/or mentally.
3.	I tend to hold on to my own views.										I tend to take into account the views of others.
4.	I tend to be informed about many issues which affect me and the society to which I belong.										I tend to be uninformed about many issues which affect me and the society to which I belong.
5.	I have extensive abilities.										I have few abilities.
6.	I have few responsibilities in relation to my own welfare and/or the welfare of others.										I have many responsibilities in relation to my own welfare, and/or the welfare of others.
7.	I have a narrow range of interests.										I have a wide range of interests.
8.	I tend to contribute towards the wider good.										I tend to be selfish.
9.	I tend towards self-acceptance.										I tend towards self-rejection
10.	I tend to focus on principles.										I tend to focus on particulars.
11.	I tend to have superficial concern for issues and events unless they directly involve me.										I tend to have deep concern for issues and events even when they don't directly involve me.
12.	I tend to think and/or behave in original ways.										I tend to imitate others in the ways I think and/or behave.
13.	I tend to have a need for certainty.										I can tolerate uncertainty
14.	I tend to think and/or behave rationally.										I tend to think and/or behave impulsively

Figure 3: Dimensions of Maturation Scale (DOMS) (adapted from Knowles 1970).

Trainee' results were converted into quantitative data by numbering each dimension from 1 on the left-hand side of the Likert scale to 5 on the right-hand side of the scale. This procedure converted respondent' ticks into a minimum point score of 14 points and a maximum total of 70 points. Scores were statistically analysed using repeated-measures ANOVA. Repeated-measures ANOVA compares actual differences in scores against differences expected by chance and is considered to be powerful since it eliminates individual differences (Gravetter & Wallnau 1996).

Female respondent' aggregate point scores indicated an average increase of 6.1 points between Pre-course and Post-course measurement. Repeated-measures analysis of variance revealed a significant move towards maturation in female trainees over the

six to eight week period of the course, $F(1, 30) = 10.4, p < .01$. Aggregate point scores for 5 male respondents showed an average increase of 11 points between Pre-course and Post-course measurement. Repeated-measures analysis of variance revealed that there was a significant move towards maturation in male trainees over the six to eight week period of the course, $F(1, 4) = 20.8, p < .01$.

The combined results for females and males indicated that the 36 respondents recorded an average increase in maturation of 6.8 points on the DOMS, $F(1, 35) = 16.2, p < .01$. As a result of the findings, it is concluded that trainees in this study made moves towards maturation as a result of the lifetime goal-setting intervention utilised prior to training commencement. This finding has important ramifications for all future VET/CBT trainees since it is the researcher's formative theory – based on Billett's (1997) argument that the effective performance of vocational concepts and procedures has dispositional underpinnings - that maturation is a subset of competence in every skill domain.

Discussion

The research with unemployed adults engaging in vocational education resulted in four findings. Firstly, that while Training Packages describe assessable outcomes in competency-referenced terms, trainees describe learning outcomes in non-competency referenced terms. Secondly, vocational trainees describe their learning in terms of dispositional outcomes, that is, in terms of values, interests and attitudes. Thirdly, dispositions can be categorised in terms of maturational concepts. Fourthly, in support of incremental theory (Dweck 1996), trainees made moves towards maturation as a result of a lifetime goal-setting intervention employed prior to training.

As a result of these findings the researcher concludes that vocational competence is dependent upon dispositional development, which in turn, results in moves towards maturation. Further, that dispositional and maturational outcomes occur as a result of a lifetime goal-setting intervention employed prior to training. These findings have important ramifications for all future VET/CBT trainees since it is the researcher's formative theory – based on Billett's (1997) argument that the effective performance of vocational concepts and procedures has dispositional underpinnings - that maturation is a subset of competence in every skill domain.

Due to the difficulty involved with separating the effects of interacting variables there remains a lingering doubt that the positive findings of the research did not eventuate as a result of lifetime goal-setting as such, but rather, as a result of latent functions of participating in the vocational education since Jahoda (1981) argues that there are five latent functions of employment that are psychologically beneficial. In the present reported research all five latent functions of employment may have been experienced by each trainee as a result of their course participation. For example, class-based course attendance imposed time structure on the days and weeks, increased social contact and participation, engendered goals and purposes to be pursued, provided each unemployed adult trainee with a new status, that of vocational trainee; and, involved each individual with the enforced activities associated with successful course completion.

In future research projects, the latent effects of course participation noted above will be explored. Also, the researcher plans to investigate the links between moves towards maturation for trainees and firstly, individual paradigm shift (Hill & McGowan 1999), secondly, double-loop learning (Argyris 1994), and thirdly, Engestrom's (1999) activity theory. In particular, the researcher is interested to explore the link between lifetime goal-setting and Engestrom's view that activity systems undergo expansive transformations when the object and motive of the activity 'are reconceptualized to embrace a wider horizon of possibilities than in the previous mode of the activity (Engestrom 1999, p. 5). Additionally, the agentic perspective of social cognitive theory (Bandura 2001) will be used to illustrate how vocational training and self-efficacy are linked to lifetime goal-setting as well as dispositional and maturational development outcomes.

References

- Anderson JR. 1982. Acquisition of cognitive skill. *Psychological Review* 89: 369-406
- Appelbaum SH, & Hare A. 1996. Self-efficacy as a mediator of goal setting and performance. *Journal of Managerial Psychology* 11: 33-47
- Argyris C. 1994. Good communication that blocks learning. *Harvard Business Review*: 77-85
- Bandura A. 1991. *Self-regulation of motivation through anticipatory and self-regulatory mechanisms*. Presented at Nebraska symposium on motivation: Vol. 38. Perspectives on motivation, pp. 69-164, Lincoln, NE
- Bandura A. 2001. Social cognitive theory: An agentic perspective. *Annual Review of Psychology* 52.
- Baumeister RF. 1996. Self-regulation and ego threat: Motivated cognition, self-deception, and destructive goal-setting. In *The psychology of action: Linking cognition and motivation to behaviour*, ed. PM Gollwitzer & JA Bargh, pp. 27-47. New York: The Guilford Press
- Baumeister RF, Heatherton TF, & Tice DM 1993. When ego threats lead to self-regulation failure: Negative consequences of high self-esteem. *Journal of Personality and Social Psychology* 64: 141-56
- Billett S. 1997. Dispositions, vocational knowledge and development: sources and consequences. *Australian and New Zealand Journal of Vocational Education Research* 5: 1-26
- Billett S. 2001. *Learning in the workplace: Strategies for effective practice*. Crows Nest, Australia: Allen & Unwin
- Cantor N, & Kihlstrom JF. 1987. *Personality and social intelligence*. Englewood Cliffs, NJ: Prentice Hall
- DfEE. 1996. *Work-based learning*, The Stationery Office, Norwich
- Dweck CS. 1996. Implicit theories as organisers of goals and behaviour. In *The psychology of action: linking cognition and motivation to behaviour*, ed. PM Gollwitzer & PM Bargh, pp. 287-312. New York: The Guilford Press
- Dweck CS, & Elliott ES. 1983. Achievement motivation. In *Handbook of child psychology*, ed. EM Hetherington, pp. 643-91. New York: Wiley
- Dymock D, & Gerber R. 2002. Unintegrated training: Exploring links between off-and on-the-job learning. *Education and Training* 44: 23-30
- Elliott ES, & Dweck CS. 1988. Goals: an approach to motivation and achievement. *Journal of Personality and Social Psychology* 53: 5-12

- Emmons RA. 1986. Personal strivings: an approach to personality and subjective well-being. *Journal of Personality and Social Psychology* 51: 1058-68
- Engestrom Y. 1999. *Expansive learning at work: toward an activity-theoretical reconceptualisation*. Presented at 7th Annual International Conference on Post-Compulsory Education and Training, Gold Coast, Centre for Learning and Work Research
- Gollwitzer PM. 1996. The volitional benefits of planning. In *The psychology of action: linking cognition and motivation to behaviour*, ed. PM Gollwitzer & JA Bargh, pp. 287-312. New York: The Guilford Press
- Gravetter FJ, & Wallnau LB. 1996. *Statistics for the behavioural sciences*. New York: West Publishing Company.
- Harris R. 1996. Reflections on the role of an evaluator. In *Qualitative research practice in adult education*, ed. PWB Neville. Ringwood: David Lovell Publishing
- Heath DH. 1977. *Maturity and competence: A transcultural view*. New York: Gardner Press
- Hewitt RL. 1995. The nature of adult learning and effective training guidelines. In *The importance of learning styles: understanding the implications for learning, course design, and education*, ed. RR Sims & SJ Sims. London: Greenwood Press
- Higgins ET. 1996. Knowledge activation: accessibility, applicability, and salience. In *Social psychology: handbook of basic principles*, ed. ET Higgins & AW Kruglanski, pp. 133-68. New York: Guilford
- Hill J, & McGowan P. 1999. Small business and enterprise development. *International Journal of Entrepreneurial Behaviour and Research* 5: 5-18
- Jahoda M. 1981. Work, employment and unemployment: Values, theories and approaches in social research. *American Psychologist* 36: 184-91
- James P. 2001. The double edge of competency training: contradictory discourses and lived experience. *Journal of Vocational Education and Training* 53: 301-23
- Klinger E. 1975. Consequences of commitment to and disengagement from incentives. *Psychological Review* 82: 223-31
- Knowles MS. 1970. *The modern practice of adult education: Andragogy versus pedagogy*. New York: Association Press
- Knowles MS. 1990. *The adult learner: A neglected species*. London: Gulf Publishing Company
- Knowles MS. 1996. *The modern practice of adult education: From pedagogy to andragogy*. Englewood Cliffs, New Jersey: Prentice Hall Regents
- Kroth M, & Boverie P. 2000. Life mission and adult learning. *Adult Education Quarterly* 50: 134-49
- Kruglanski AW. 1996. Goals as knowledge structures. In *The psychology of action: linking cognition and motivation to behaviour*, ed. PM Gollwitzer & JA Bargh, pp. 287-312. New York: The Guilford Press
- Levinson DJ. 1986. A conception of adult development. *American Psychologist* 41: 3-13
- Little BR. 1983. Personal projects: a rationale and method for investigation. *Environment and Behaviour* 15: 273-309
- Markus H, & Nurius P. 1986. Possible selves. *American Psychologist* 41: 954-69
- Medin DL. 1989. Concepts and conceptual structure. *American Psychologist* 44: 1469-81
- Meichenbaum. D., & Biemiller A. 1998. *Nurturing independent learners: helping students take charge of their learning*. Ontario: University of Toronto: Brookline Books

- Mulcahy D. 2000. Turning the contradictions of competence: competency-based training and beyond. *Journal of Vocational Education and Training* 52: 259-80
- Murphy GL, & Medin DL. 1985. The role of theories in conceptual coherence. *Psychological Review* 92: 289-316
- Nunnally J. 1967. *Psychometric Theory*. New York: McGraw-Hill
- OVAL Research 2003. Changing Pedagogy: Contemporary vocational learning, *OVAL Research Working Paper 03-12*, The Australian Centre for Organisational, Vocational and Adult Learning: <http://www.oval.uts.edu.au>
- Perkins D, Jay E, & Tishman S. 1993. Beyond abilities: A dispositional theory of thinking. *Merrill-Palmer Quarterly* 39: 1-21
- Pervin LA, ed. 1989. *Goal concepts in personality and social psychology*. Hillsdale, NJ: Erlbaum
- Prawat RS. 1989. Promoting access to knowledge, strategy, and dispositions in students: A research synthesis. *Review of Educational Research* 59: 1-41
- Rae D. 2003. Opportunity centred learning: an innovation in enterprise education? *Education and Training* 45 (8): 542-549.
- Salas E, & Cannon-Bowers JA. 2001. The science of training: a decade of progress. *Annual Review of Psychology* 52: 471-99
- Stevenson JC. 1994. Vocational expertise. In *Cognition at work: The development of vocational expertise*, ed. J Stevenson, pp. 7-35. Adelaide, Australia: National Centre for Vocational Education Research