
From learning styles to learning skills: the executive skills profile

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Abstract

Contents that a typology of skills based on a framework of learning styles and experiential learning theory, rather than a framework of job performance or some other personality construct, provides a language and guidance for assessment methods to describe knowledge at the performance level of adaptation. It requires development of the concept of learning skills which are: domain-specific and knowledge-rich; descriptive of an integrated transaction between the person and the environment; and developed by practice. Reviews and reports data from numerous studies to establish the ESP's reliability, relational validity, criterion validity and construct validity. The ESP can be used as a vehicle for providing personal and organizational feedback on skills, and expectations and intent regarding skills in jobs and development programmes.

Forty years ago Kluckholm and Murray[1, p. 1] described psychology as a search for three different kinds of order in human behaviour:

Every person is like every other person in some ways. Every person is like some other person in some ways. Every person is like no other person in some ways.

The concept of style has been a major vehicle for creating typologies of individuality; that is, for understanding the ways in which every person is like some other person. Holistic concepts of style allow deeper study of human uniqueness by providing a normative description of a personal style across individuals and an idiographic profiling in an individual of the style in relation to the other styles in the holistic model. Examples of this approach are the Myers-Briggs type indicator which assesses Jungian personality types[2], Shutz's FIRO-B assessing interpersonal relationship orientations[3] and the Allport-Vernon[4] and Rokeach[5] value typologies.

Learning styles and the structure of knowledge

In experiential learning theory[6], the model of style is based on a theory of learning. The theory defines four phases in the process of learning from experience:

- concrete experience;
- reflective observation;
- abstract conceptualization; and
- active experimentation.

Individual learning styles are defined by a person's reliance on these four learning modes. Thus, learning styles are similar to what cognitive psychologists call learning strategies[7], executive control processes, strategic knowledge or cognitive strategies. Gagne[8, p. 38] says these strategies "enable learners to choose at appropriate times the intellectual skills and declarative knowledge they will bring to bear on learning, remembering, and problem solving". Unlike these cognitive approaches, the experiential learning style framework is holistic, including affective, perceptual and behavioural as well as cognitive strategies.

This typology of learning styles has also proved useful as a typology of knowledge. In this perspective, learning styles are higher-order heuristics for "learning how to learn"

and represent the deep structure of the knowledge that is imparted in knowledge specialties and professions.

Experiential learning theory describes a three-dimensional model of human knowledge. The base of the model maps knowledge specialties by their relative emphasis on the two dimensions of concreteness versus abstractness and action versus reflection. This map has been validated in several professions by numerous studies showing relationships between individual learning style and educational specialization, career choice and job role [9]. When knowledge specialties are defined by the learning style heuristics used by specialists in these fields, the pattern arrayed on the two dimensions of concrete/abstract and active/reflective is isomorphic with independent investigations of the structure of academic fields [10], Ann Roe's [11] model of career structure, Holland's [12] typology of vocational interests and Quinn's [13] model of organizational value and role differentiation. Results are also consistent with Fine's [14] functional job analysis system on which the *Dictionary of Occupational Titles* [15] is based.

The third dimension of the model is integrative complexity comprising the degree of specialization and integration of knowledge. It defines three levels of adaptation: performance, learning and development. At the performance level, knowledge is discrete, content-focused and of limited time duration. At the level of learning, the application of knowledge is extended in time and space to include generically similar situations. Knowledge at the developmental level is organized in the longest time perspective and is concerned with the strategic control of adaptation.

Our goal in this research is to develop a language and assessment methodology for describing knowledge at the performance level that is consistent with experiential learning theory and the knowledge structure models described above. In earlier work, the organization of a person's knowledge at the level of learning was assessed via the learning style inventory. The organization of knowledge at the developmental level was assessed in the adaptive style inventory by computing the adaptive flexibility of an individual's responses to different learning situations. This article reports the development and initial validation of an instrument designed to assess learning

skills at the performance level of knowledge, called the "executive skills profile".

Definition of learning skills

A skill is a combination of ability, knowledge and experience that enables a person to do something well. A learning skill defines a generic heuristic that enables mastery of a specific domain. It has two components: a domain of application and a knowledge transformation process. Three aspects of this definition are important:

- (1) *Skills are domain-specific and knowledge-rich.* Glaser [16] criticized general process approaches in education because they ignore the interactions between structures of knowledge and cognitive processes. One example he cited was research on expert problem solving that showed high levels of competence as characterized by rich structures of domain specific knowledge rather than superior execution of a general problem-solving process. Similarly, Minsky and Papert [17, p. 98] described developments in the field of artificial intelligence suggesting that: "A very intelligent person might be that way because of specific local features of his knowledge, organizing knowledge rather than because of global qualities of his thinking". The skill assessment challenge is to develop a skill taxonomy that is sufficiently refined to describe person and job variations accurately, yet not so complex as to defy generalization across persons and tasks. That is a problem with the four learning-style modes or Fine's data-people-things typology. As Fleishman [18, p. 828] reported: "Reviews of earlier work led to the conclusion that neither highly specific, nor highly generalized, categories were likely to be most useful in generalizing principles across tasks".
- (2) *A skill describes an integrated transaction between the person and the environment.* Skills are integrated routines combining knowledge and ability of the person with a perceived environmental domain of application. This integration between personal skill and environmental domain allows for commensurate measurement of person-environment fit [19]. Fleishman [18] called this an abilities requirement approach through which

specific environments are characterized by their skill demands. Skilled performance is the result of a "fit" or synergy between personal skill and environmental demand. This congruence has been described as an optimal experience of flow[20]. Flow can be said to occur when people are able to meet the challenges of their environment with appropriate skills and, accordingly, feel a sense of well-being, mastery and a heightened self-esteem. However, learning a skill may require some separation from the environment to allow reflection and generalization. In the developmental mode, Perlmutter[21] and Kolb[6] suggested a counter-balancing response regarding the person-environment transaction which brings to the situation the missing perspective that allows learning to occur.

- (3) *Skills are developed by practice.* While learning styles vary over short periods of time in test-retest reliability studies[22], data on the relationship between the learning styles of adult respondents and their undergraduate majors suggest a longer term, more stable component(cf.[23]). Learning skills, however, are developed by learning from experience and as a result are more variable and subject to intentional personal development. For example, Anderson[24] described the acquisition of cognitive skill as a "learning by doing" system that translates declarative knowledge into procedural knowledge. He described the ubiquity of the log-linear law of practice in skill acquisition research. The integrated transaction between a personal skill routine and its domain of application is thus developed iteratively by learning from experience. Fitts[25] described three phases in this process that apply to a wide range of skills: the *cognitive stage* of initial encoding which permits the learner to generate a crude approximation of the skilled behaviour; the *associative stage* of smoothing out errors in performance; and the *autonomous stage* of gradual continued improvement in performance.

Assessment of learning skills: the "executive skills profile"

The executive skills profile (ESP) is a 72-item, modified Q-sort[26] assessment instrument

designed for management populations in business, education and health care. Respondents are asked to sort 72 learning skill cards twice, once into seven categories describing their personal skill level and a second time describing their job demands. The learning skills' typology is composed of 12 six-item scales. Each scale defines a vector in the two-dimensional abstract/concrete and active/reflective knowledge space of experiential learning theory. Using the familiar metaphor of a clock face, vector directions are specified by hourly clock positions, as shown in Figure 1. Eleven, twelve and one o'clock scales assess interpersonal learning skills most associated with the concrete experience learning mode. Two, three and four o'clock assess information skills associated with reflective observation. Five, six and seven o'clock assess analytic skills associated with abstract conceptualization. Eight, nine and ten o'clock assess behavioural skills associated with active experimentation.

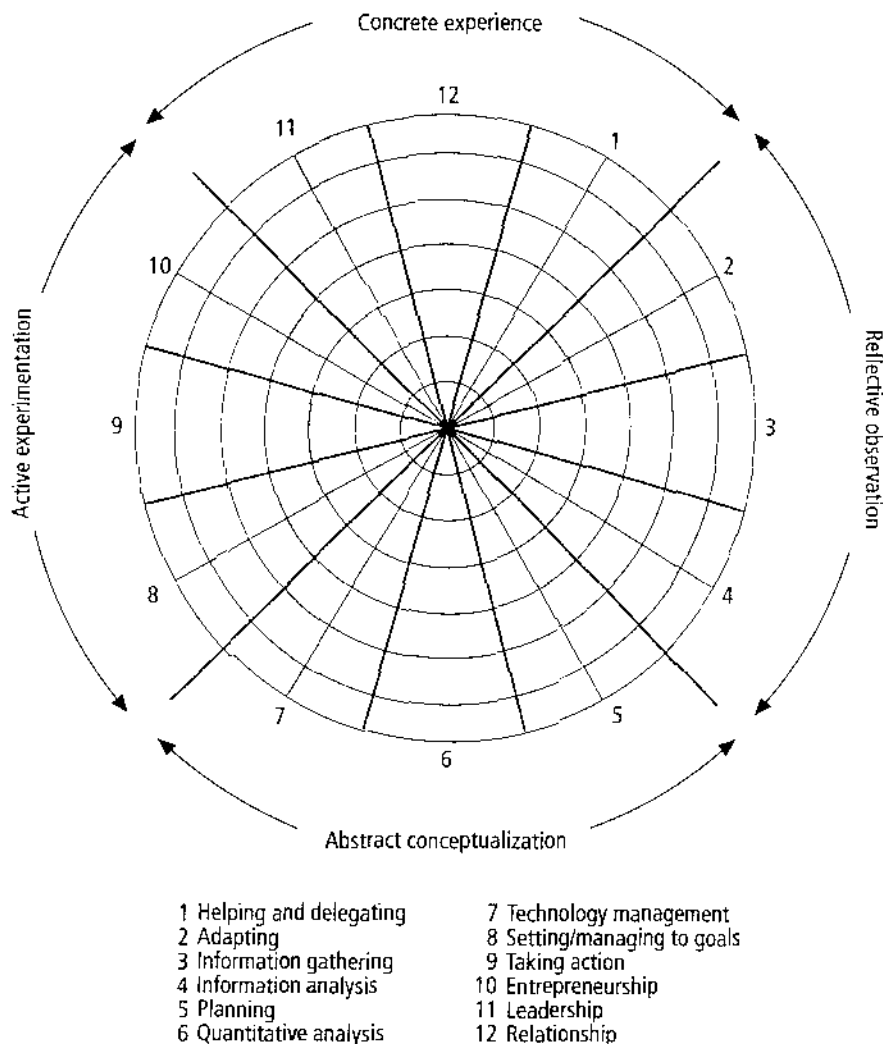
The item wording and vector direction of each learning skill scale were determined by building scales around anchoring items from earlier research on the relationship between learning style and acting, valuing, thinking and deciding skills[6, pp. 94-5]. For example, the learning skills of dealing with people and sensitivity to feelings fell on the 12:00 vector with items such as "working as a member of a team", and "being sensitive to others". The 5:00 vector included items such as "seeing how things fit into the big picture". This abstract definition of learning skills as vectors in the two-dimensional knowledge space of experiential learning theory allows comparison across the language barriers of different fields and jobs, while defining specific learning skills in the context and language of the field of study. In its current version, the executive skills profile is focused on management skills. Future versions can be adapted to assess learning skills in other fields. The comparability of future versions can be assessed by the vector congruence in the two-dimensional experiential learning knowledge space.

Empirical evidence

Reliability and intercorrelation

The ESP has been used in a number of studies, resulting in a sample of 463 adults from the following occupational groups:

Figure 1 The executive skills profile



- 192 MBA students, average age of 27, one-third of whom were females[27,28];
- 58 female supervisory and middle-level managers from a telecommunications company[29];
- 71 male middle-level managers and executives from two divisions of a manufacturing company[30];
- 35 male managers of scientists in a research laboratory[31];
- 33 male physician executives[32];
- 17 supervisory and middle-level managers from a variety of businesses currently serving on a university advisory board; and
- 57 educators and educational administrators.

Initial reliability of the scales was computed with Cronbach's alpha; values are shown in Table I with other descriptive statistics. The skew (ranging from -0.20 to 0.40 with a mean of 0.03) and the kurtosis (ranging from -0.46 to 0.19 with a mean of -0.23) of each scale, in addition to the reported statistics suggest normal distributions. The internal scale reliabilities ranged from 0.676 to 0.827, with an average of 0.754. Two scales were adjusted by the removal of one particular item from each scale. For comparability to other scales, the resulting score on each of these scales was multiplied by 1.20.

Relational validity

The scales were theoretically conceived to be related to those close to the same part of the

Table I Scale reliability and description

Clock position	Scale	Mean	SD	Median	Alpha
11:00	Leadership	27.3	6.10	27.0	0.814
12:00	Relationship building	30.0	5.12	30.0	0.766
1:00	Helping and delegating	28.6	5.68	29.0	0.794
2:00	Adapting	28.5	5.12	28.0	0.762
3:00	Information gathering	27.6	5.14	27.6	0.678
4:00	Information analysis	24.8	5.39	25.0	0.704
5:00	Planning	22.9	5.60	23.0	0.676
6:00	Quantitative analysis	20.0	7.32	19.2	0.827
7:00	Technology management	19.8	6.03	19.0	0.687
8:00	Setting/managing to goals	26.3	5.60	26.0	0.785
9:00	Taking action	27.8	5.01	28.0	0.734
10:00	Entrepreneurship	30.4	5.55	30.0	0.825

Note: n = 463

underlying learning framework. Scores were expected to be highly intercorrelated with scales close to their positions on the clock. For example, the 12:00 scale, called "relationship building" skill, was expected to be highly correlated with the 11:00 scale, called "leadership", and the 1:00 scale, called "helping and delegating". In contrast to some other forms of assessment instruments and common practices in scale construction, independence of the scales in related positions of the clock was not desired.

The scales showed a high degree of inter-correlation with those scales in related clock positions, as shown in Table II. Seven of the scales show their highest correlations with an immediate neighbour in the clock positions.

These were:

- "leadership";
- "relationship building";
- "helping and delegating";
- "planning";
- "setting and managing to goals";
- "taking action"; and
- "entrepreneurship" skills.

Three scales show the highest correlation with a scale that is one scale position away (i.e. adjacent to a scale that is next to the scale in question). These were: "information gathering", "information analysis" and "quantitative analysis" skills.

The two scales that do not conform to this pattern are "adapting" and "technology management" skills. The adapting skill is the most highly correlated with the entrepreneurship skill: and it is highly correlated with the leadership and planning skills. This suggests that adapting skills may be viewed or experi-

enced as more "active" than reflective. Technology management is highly correlated with information analysis. It is also highly correlated with quantitative analysis, which is an immediate neighbour in the clock configuration. This relationship may have more to do with the nature of the items in both scales concerning computers and using computers for analysis than it does with any anomalies in the scale relationships.

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 mean for these average correlations
 was computed and squared...'

To estimate the strength of these associations, the average correlation of each scale was computed with those scales that were located in the next clock positions (i.e. for the 12:00 scale, its correlation with the 11:00 and 1:00 scales was averaged), and for those scales, two, three, four, five and six positions on the clock away from each scale. To get an estimate of variance – although not unique variance – the mean for these average correlations was computed and squared. The result is that scales one position away from a given scale appear to account for 31 per cent of the variance on the average. Those two positions away appear to account for 22 per cent of the variance. Those three, four, five and six positions away appear to account for 17, 9, 8 and 6 per cent of the variance, respectively. This supports the notion that the scales are the most associated with those scales appearing closest to them on the clock configuration.

Table 11 Intercorrelation of scales

	Relation- ship building	Helping and delegating	Adapting	Information gathering	Information analysis	Planning	Quantitative analysis	Technology management	Setting/ managing to goals	Taking action	Entre- preneur- ship
Leadership	0.546	0.656	0.610	0.570	0.155	0.351	-0.070	0.127	0.590	0.442	0.723
Relationship building		0.736	0.482	0.604	0.098	0.195	-0.159	-0.005	0.460	0.428	0.456
Helping and delegating			0.575	0.612	0.127	0.298	-0.102	0.100	0.565	0.445	0.534
Adapting				0.588	0.400	0.600	0.145	0.261	0.570	0.431	0.708
Information gathering					0.245	0.363	0.017	0.153	0.526	0.402	0.553
Information analysis						0.606	0.636	0.629	0.242	0.316	0.321
Planning							0.534	0.563	0.398	0.347	0.492
Quantitative analysis								0.614	0.073	0.159	0.080
Technology management									0.275	0.314	0.253
Setting/ managing to goals										0.667	0.602
Taking action											0.545

Notes: $n = 463$

Correlations above 0.092 are statistically significant beyond the $p = 0.05$ level, and correlations above 0.155 are significant beyond the $p = 0.001$ level

Another test of the ESP's relational validity is an assessment of its relationship to the underlying learning framework presented in the learning style inventory (LSI). Boyatzis and Renio[27] studied relationships between the ESP and LSI of 148 MBA students. They used the original nine-item form of the LSI. Marsick[30], Dreyfus[31], Sharp[33], and a sample of 44 middle-level and executive managers from a manufacturing company completed the ESP and the revised 12-item form of the LSI. The leadership, relationship building, and helping and delegating skills, from the 11:00, 12:00 and 1:00 positions, correlated significantly with a disposition towards concrete experience over abstract conceptualization ($r = 0.164$, $r = 0.164$, and $r = 0.189$, respectively; $n = 148$, $p < 0.02$, one-tailed) in the MBA sample. Relationship building skill positively correlated with this same disposition in the combined sample

($r = 0.200$, $n = 124$, $p < 0.01$, one-tailed). Entrepreneurship skill, the 10:00 position, correlated significantly with a disposition towards concrete experience ($r = 0.133$, $n = 148$, $p < 0.05$, one-tailed). Therefore, five of the six scales expected to correlate with this learning orientation, did so; only the adapting skill, the 2:00 position, did not.

Quantitative analysis, the 6:00 position, correlated positively with a disposition towards abstract conceptualization over concrete experience ($r = 0.192$, $n = 124$, $p < 0.01$, one-tailed, in the combined sample; $r = 0.136$, $n = 148$, $p < 0.05$, one-tailed, in the MBA sample). Planning, the 5:00 position, correlated positively with the same learning disposition ($r = 0.165$, $n = 124$, $p < 0.03$, one-tailed) in the combined sample. Two of the five scales expected to correlate with this learning orientation, did so; information

analysis, technology management, and setting and managing to goals did not.

Taking action and entrepreneurship skills, from the 9:00 and 10:00 positions, correlated positively with a disposition towards active experimentation over reflective observation ($r = 0.154, n = 124, p < 0.04; r = 0.219, n = 124, p < 0.01$) from the combined sample. Two of the five scales expected to correlate with this learning orientation, did so; leadership, technology management, and setting and managing to goals did not.

Of the five scales expected to correlate with the reflective observation learning disposition over the active experimentation, none did. The adapting skill, the 2:00 position, correlated positively with the opposite direction ($r = 0.146, n = 124, p < 0.05$, one-tailed) in the combined sample. The information gathering skill, the 3:00 position, correlated positively with a concrete experience disposition towards learning ($r = 0.163, n = 148, p < 0.05$, two-tailed) in the MBA sample, which was unexpected. No other unexpected correlations appeared. Seven scales of the ESP correlated with the LSI in predicted directions.

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'...skills located in the lower sector of the clock were positively related to the GMAT measure of scholastic aptitude...'
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Data on several other characteristics were available to assess further the relationship between the ESP and the underlying learning orientations. In two samples of MBA students[27,28], a measure of scholastic aptitude, the graduate management admissions test (GMAT) score, was compared to ESP scores. Skills located in the upper sector of the clock were negatively related to GMAT scores. They were:

- entrepreneurship ($r = -0.267, n = 144, p < 0.05$);
- leadership ($r = -0.233, n = 141, p < 0.05; Pr = -0.201, n = 144, p < 0.05$);
- relationship building ($r = -0.247, n = 144, p < 0.05, r = -0.287, n = 141, p < 0.05$);
- helping and delegating ($r = -0.245, n = 144, p < 0.05; r = -0.277, n = 141, p < 0.05$); and
- information gathering skills ($r = -0.305, n = 141, p < 0.05$).

Meanwhile, those skills located in the lower sector of the clock were positively related to the GMAT measure of scholastic aptitude.

They were:

- information analysis ($r = 0.235, n = 144, p < 0.05$);
- quantitative analysis ($r = 0.258, n = 144, p < 0.05$); and
- technology management ($r = 0.267, n = 144, p < 0.05$).

Since the lower sector of the clock was theoretically determined to relate to an abstract learning orientation and the upper sector of the clock was theoretically determined to relate to the opposite (i.e. a concrete learning orientation), the relationship to this measure of scholastic aptitude supports the underlying theoretical framework.

In two samples[29,31], possessing advanced degrees was positively related to information analysis, planning and quantitative analysis skills, and negatively related to the setting and managing to goals skill. This reveals a link between the skills associated with an assimilative learning orientation in terms of the underlying learning framework. This observation is consistent with studies showing a link between attending graduate professional schools and building those skills[6,27,28].

Criterion validation: the boss's view

A group of 44 male upper- and middle-level managers in a division of a manufacturing company used the ESP to describe themselves. Their bosses, who were divisional executives, used the ESP to describe their subordinates. The scores on the 12 scales, when added together, form a total score that can be interpreted as a person's overall view of the given individual's level of capability on that skills assessed in the ESP, or that individual's view of his/her own overall capability on these skills. The boss's view of the manager's total score was significantly positively correlated with the manager's own view ($r = 0.328, n = 44, p = 0.03$).

A significant positive correlation was found between the boss's view of the manager's skills and the manager's own views of his skills on eight of the 12 scales in the ESP. They were:

- leadership;
- helping and delegating;
- information analysis;

- planning;
- quantitative analysis;
- technology management;
- setting and managing to goals; and
- entrepreneurship.

The correlations are shown in Table III.

The boss's view of the manager's leadership skill was also positively correlated with the manager's view of his helping and delegating skill and his setting and managing to goals skill. To the boss, the manager's actions in helping his subordinates, delegating work to

them, setting performance goals with them, and managing performance through review and commentary on their goals appear as behaviours associated with a leader. In part, this relationship is supported by the positive relationship between the boss's view of a manager's helping and delegating behaviour and the manager's own view of his setting goals with subordinates and managing their performance towards them. The negative relationship between the boss's view of the manager's relationship building skill and adapting and entrepreneurship skills may

Table III Comparison of a manager's view ($n = 44$) of his skills with his boss's views ($n = 44$) of his skills (*)

Boss's view of manager's skills	Correlation	Manager's view of own skills
Leadership 11:00	0.344 ^{a*}	Leadership
	0.333 ^a	Helping/delegating
	0.316 ^a	Setting/managing to goals
Relationship building 12:00	-0.299 ^a	Adapting
	0.078 [*]	Relationship building
	-0.308 ^a	Entrepreneurship
Helping/delegating 1:00	0.431 ^{b*}	Helping/delegating
	0.355 ^a	Setting/managing to goals
Adapting 2:00	0.243 [*]	Adapting
	0.344 ^a	Setting/managing to goals
Information gathering 3:00	0.346 ^a	Helping/delegating
	0.173 [*]	Information gathering
Information analysis 4:00	0.492 ^{c*}	Information analysis
	0.339 ^a	Planning
	0.453 ^b	Quantitative analysis
	0.383 ^b	Technology management
Planning 5:00	0.367 ^b	Information analysis
	0.499 ^{c*}	Planning
	0.404 ^a	Quantitative analysis
Quantitative analysis 6:00	0.367 ^a	Technology management
	0.548 ^c	Information analysis
	0.354 ^a	Planning
Technology management 7:00	0.641 ^{c*}	Quantitative analysis
	0.306 ^a	Technology management
	0.362 ^a	Information analysis
Setting/managing to goals 8:00	0.375 ^b	Quantitative analysis
	0.500 ^{c*}	Technology management
	0.359 ^{a*}	Setting/managing to goals
Taking action 9:00	0.214 [*]	Taking action
Entrepreneurship 10:00	0.333 ^{a*}	Entrepreneurship
	0.352 ^a	Leadership

Notes: ^a = $p < 0.05$

^b = $p < 0.01$

^c = $p < 0.001$

* Correlations of the same scale are asterisked for convenience

result from this particular organization's culture which, like many older manufacturing companies, views attempts at adapting to the market conditions as threatening the stability and smooth operations of the plant and relationships with customers, suppliers and employees that have been built over the years.

The boss's view of the manager's adapting skill was positively related with the manager's view of his own skill in setting and managing to goals. The boss's view of the manager's information gathering skill was related to the manager's view of his own helping and delegating skill. The boss's view of the manager's information analysis skill was positively related to the manager's view of his own planning, quantitative analysis and technology management skills. These relationships appear to be a function of their close proximity with regard to the underlying framework of the learning styles (i.e. the assimilative quadrant of the learning style framework).

The same reasoning provides an interpretation for the positive relationships between:

- (1) the boss's view of the manager's planning skill and the manager's view of his information analysis, quantitative analysis and technology management skills;
- (2) the boss's view of the manager's quantitative analysis skill and the manager's view of his information analysis, planning and technology management skills;
- (3) the boss's view of the manager's technology management skill and the manager's view of his information analysis and quantitative analysis skills; and
- (4) the boss's view of the manager's entrepreneurship skill and the manager's own view of his leadership skill.

Criterion validation: promotability

Two studies compared the ESP scores of managers who were promoted versus their counterparts who were not promoted. Friedman[29] studied 55 female supervisory and middle-level managers in a telecommunications company. The managers had been employed by the company for approximately the same number of years, were about the same age and had similarly high performance appraisal ratings on the company's system. Marsick[30] studied 32 male middle-level managers from a manufacturing company over an 18-month period, and compared those who were promoted to those who stayed

at the same job level and those who were demoted.

Regarding the manager's skills, Friedman[29] reported that promoted managers had significantly higher information analysis and planning skills. Marsick[30] reported that promoted managers had significantly higher technology management, taking action and entrepreneurial skills than did those who stayed at the same job level. Entrepreneurial skills of those who stayed the same were also significantly higher than the skills of those who were demoted.

Regarding the ESP completed concerning the job demands of the managers, Marsick[29] found that those managers who stayed at the same levels had significantly higher scores (i.e. expectations of job demands) on leadership, helping and delegating, setting and managing to goals, and taking action skills than did those who were demoted.

Marsick[30] computed a gap score by subtracting the skill score from the job demand score on each scale. The resulting gap was thought to reflect the lack of "fit" between the manager's skills and the job demands or expectations. The gap was significantly higher for those who stayed at the same level than it was for those who were promoted on adapting, information analysis, planning, technology management and entrepreneurship skills. Those managers who were demoted had significantly greater gaps on the entrepreneurship skill than did those who stayed at the same level.

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Although information analysis and planning skills appear to be important determinants of promotability in both studies, other scales were equally important in the manufacturing company. The observation can be made that corporate culture (i.e. shared beliefs, values and norms in the organization) will affect which skills are valued and rewarded through promotion. In the manufacturing company, Marsick[30] reported that it was an action-oriented culture that had been striving to become entrepreneurial. The company had been restructured into small strategic business

units and so had provided the general managers with a great deal of autonomy. The skill scales in the "active" sector of the ESP model were important determinants of promotability (i.e. leadership, entrepreneurship, taking action, setting and managing to goals and technology management skills).

It also appeared that managers who did not see "people management" as an important aspect of their jobs were less likely to be allowed to stay at their current job levels. That is, those demoted saw significantly less job demands on leadership and helping and delegating than did their peers who stayed at the same level [30]. These factors could be viewed as threshold characteristics. In this company, it would appear that if you did not see the job as involving action skills and people management, you were likely to be viewed as "not qualified" to be promoted, or certainly not viewed as someone who "fitted into" the corporate culture. Other organizations will probably have an emphasis on those skills most valued in their own cultures.

Criterion validation: managerial performance

In a study of 35 male managers of scientists and engineers at a government research facility, Dreyfus [31] identified a cadre of managers who were repeatedly nominated by subordinates, peers and their bosses as highly effective managers. She also identified a random sample from a cadre of managers who were not repeatedly nominated by any of these groups, as typical managers. She reported that the highly effective managers showed significantly higher scores in leadership skills, and near-significant higher scores (on two-tailed tests) on helping and delegating, adapting and setting and managing to goals skills than did the typical managers. Since they were all in the same managerial role with the same job title, the differences were particularly impressive in that these groups showed no differences in their views of the demands of the job in terms of the ESP scales. Although the jobs were seen as the same, the more effective managers had more people management and adapting skills than did their less effective counterparts.

Criterion validation: faculty intent and student outcome

Boyatzis [34] reported a study that was conducted by a senior faculty committee at a

major research university to determine the content and skill objectives of faculty in an MBA programme. The ESP was used as a way for the faculty to describe the level of importance of various skills in the design and delivery of their courses. Two faculty members were interviewed regarding each of the 13 required courses and one faculty member was interviewed regarding 29 out of the 58 electives offered to MBAs. A profile was computed as to the skills emphasized by the faculty.

Studies on students were conducted at the same time to determine the impact of this MBA programme in terms of various abilities related to managerial performance over two years with two separate samples representing each year of the study [27,28]. A cross-sectional design was used on census or random samples of entering and graduating students to determine the impact of the programme. Foreign students, whose native language was not English, were excluded from the analysis reported here to enable comparison without complications due to language. In addition to the 122 students involved in the first-year sample and the 106 students involved in the second-year sample, a very small longitudinal sample of nine students was identified from these random samples. The ESP was one of the instruments used in both of these studies.

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 '...A cross-sectional design was used on census or random samples of entering and graduating students to determine the impact of the programme...'

A median split was conducted on the faculty's intent. Of the six scales with the faculty's highest scores, students showed statistically significant increases on three of the scales for both yearly samples and for the small longitudinal sample. They were:

- information analysis;
- planning; and
- quantitative analysis skills.

The adapting skill was high in terms of faculty intent and showed a near-significant (on a two-tailed test) increase of students in the first-year sample only.

Of the six scales reflecting lower faculty intent, four of the scales showed no significant effects on any of the samples. The first-year

sample showed a near significant increase on taking action skill, and the small longitudinal sample showed a significant increase on technology management skill, both of which were relatively low on the faculty intent split.

Faculty intent concerning abilities appeared strongly linked to student changes in skills in this graduate management programme. Boyatzis[34] noted that skills on which faculty intent and student increases were most closely aligned are also skills reportedly increased in studies of other graduate professional education programmes, namely social work and engineering[35].

Relationship to competences

Boyatzis[35], identified a set of competences which significantly differentiated superior and effective managers from their less effective counterparts in 12 organizations. These studies were conducted on managers using performance criteria. The skill levels of the competences were coded from transcripts of critical incident interviews. Two studies were conducted in which managers completed the ESP and a one-hour critical incident interview, both of which were coded for these competences.

“Concern with impact” is a concern with one’s reputation and wanting impact on others. It appeared to be related to:

- leadership ($r = 0.336, n = 35, p < 0.05$)[31];
- helping and delegating ($r = 0.342, n = 35, p < 0.05$)[31]; and
- information gathering skills ($r = 0.270, n = 55, p < 0.05$)[29].

“Positive regard” is a belief in others and was related to:

- entrepreneurship ($r = 0.384, n = 35, p < 0.05$);
- leadership ($r = 0.492, n = 35, p < 0.05$);
- relationship building ($r = 0.368, n = 35, p < 0.05$); and
- helping and delegating skills ($r = 0.394, n = 35, p < 0.05$)[31].

“Developing others” is the ability to give feedback to another for the purpose of helping to improve their performance. It was related to:

- relationship building ($r = 0.250, n = 55, p < 0.05$)[29];
- helping and delegating ($r = 0.270, n = 55, p < 0.05$)[29]; and

- technology management skills ($r = 0.379, n = 35, p < 0.05$)[31].

Except for technology management, the ESP skills related to these three competences are primarily those in the upper half of the clock representation. Since concern with impact, positive regard and developing others are all involved with people, it appears that the upper scales relate to other concepts of people management, as the theory claims.

“Managing group process” is the ability to build co-operation and spirit in a work group. It was positively related to planning ($r = 0.350, n = 35, p < 0.05$)[31] and negatively related to setting and managing to goals skills ($r = -0.370, n = 55, p < 0.05$)[29]. In these organizations, planning is oriented to projects, which are group efforts. Setting and managing to goals, in which the items are primarily individually-oriented, may be counter-productive to working in groups.

“Stamina and adaptability” was related to:

- information analysis ($r = 0.290, n = 55, p < 0.05$);
- quantitative analysis ($r = 0.440, n = 55, p < 0.05$); and
- technology management skills ($r = 0.260, n = 55, p < 0.05$)[29].

“Perceptual objectivity” is an ability to see both sides of an argument, even if you are holding one of those positions. This was negatively related to quantitative analysis ($r = -0.396, n = 35, p < 0.05$) and technology management skills ($r = -0.338, n = 35, p < 0.05$)[31]. Since both of these skills are highly abstract in their orientation, it suggests that the sensitivity to people needed to understand their views may be in conflict with creating abstract ideas about the world.

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 ‘...’Efficiency orientation’ is an ability reflected in the concern for doing things better than previously and attending to maximizing output per input...’

“Conceptualization” is a cognitive ability to see patterns or themes in seemingly random information or events. It was negatively related to the taking action skill ($r = -0.439, n = 35, p < 0.05$)[31]. It can be said that it is difficult to take the time to notice and concep-

tualize patterns in events if your orientation is towards taking action.

"Efficiency orientation" is an ability reflected in the concern for doing things better than previously and attending to maximizing output per input. "Use of oral presentations" is an ability to make clear, concise and impactful presentations to others. Both of these competences were positively related to the entrepreneurship skill ($r = 0.270$ and $r = 0.250$, respectively; $n = 55$, $p < 0.05$) [29]. This is a skill with which a person innovates in his/her environment (e.g. maximizes the use of his/her efforts and time) and tries to make things happen.

Relationship to motives

Three studies were conducted in which people completed the ESP and the thematic apperception test assessing unconscious motives. All correlations with an $n = 22$ are from Marsick [30]. All correlations with an $n = 35$ are from Dreyfus [31]. All correlations with an $n = 148$ are from Boyatzis and Renio [27]. The unconscious motive of wanting to be a part of warm, close relationships is called the "need for affiliation" [36]. It was negatively related to information gathering ($r = -0.164$, $n = 148$, $p < 0.05$), technology management ($r = -0.340$, $n = 35$, $p < 0.05$), entrepreneurship skills ($r = -0.212$, $n = 148$, $p < 0.05$) in one study and positively related to entrepreneurial skills in another study ($r = 0.398$, $n = 22$, $p < 0.05$). This suggests that a focus on information and technology may preclude a willingness to focus on people.

The unconscious motive of wanting to do something better is called the "need for achievement" [36]. It was positively related to the quantitative analysis ($r = 0.168$, $n = 148$, $p < 0.05$) and helping and delegating skills ($r = 0.366$, $n = 22$, $p < 0.05$). People with high need for achievement are always seeking to measure their performance and for feedback. This orientation towards measurement often results in seeking quantitative methods of assessing performance.

The unconscious motive of wanting to have impact on others is called the "need for power" [36]. It was positively related to the technology management skill ($r = 0.414$, $n = 35$, $p < 0.05$).

"Activity inhibition", which is a measure of self-control at the trait level [36], was negatively related to information analysis ($r = -0.425$,

$n = 35$, $p < 0.05$), planning ($r = -0.343$, $n = 35$, $p < 0.05$), taking action ($r = -0.388$, $n = 22$, $p < 0.05$) and entrepreneurship skills ($r = -0.418$, $n = 22$, $p < 0.05$).

Relationship with stylistic traits

Dreyfus [31] compared the ESP and the Myers-Briggs. The Myers-Briggs assesses a person's style in terms of eight traits [2]. The "intuition versus sensing" orientation reveals an interest in abstractions and insights imagined in the future as compared to perceiving objects, events, and details of the present moment. The intuition-sensing scale showed a positive relationship with information analysis, planning, quantitative analysis and technology management skills ($r = 0.459$, $r = 0.560$, $r = 0.616$, and $r = 0.411$, respectively; $n = 35$, $p < 0.05$). These skills represent reflective and abstract orientations in terms of the underlying learning styles framework and the configuration of the clock positions of these scales.

The "perceiving versus judging" orientation reveals a preference for observing and understanding events of the outside world rather than seeking to organize or control them. The perceiving-judging scale showed a positive relationship with the planning, quantitative analysis and technology management skills ($r = 0.390$, $r = 0.423$, and $r = 0.393$, respectively $n = 35$, $p < 0.05$), and a negative relationship with the taking action skill ($r = -0.346$, $n = 35$, $p < 0.05$). These skills represent abstract orientations in terms of the underlying learning style framework and the configuration of the clock positions of these scales.

Relationship with other constructs

In a sample of MBA students [27], the relationship building skill showed a significant positive correlation with the *content filtered score* from the *profile of non-verbal sensitivity* ($r = 0.167$, $n = 141$, $p < 0.05$) [37]. Since the content filtered score is a measure of a person's sensitivity to hearing non-verbal messages from others, it would be expected to relate to the scale most closely involved with relating to others and building relationships with them.

In this same sample, the information gathering skill showed a significant positive correlation with the score on the *test of thematic analysis* ($r = 0.178$, $n = 138$, $p < 0.05$). Mean-

while, the quantitative analysis skill showed a significant negative correlation with the score on this test ($r = -0.169$, $n = 138$, $p < 0.05$). The rest of thematic analysis is a measure of cognitive complexity [38,39]. Since the test asks people to assess verbal material, it is specifically a measure of verbal cognitive complexity. Building quantitative analytic ability may extinguish or interfere with a person's verbal ability by desensitizing the person to verbal cues and getting out of practice in seeing patterns in verbal information (i.e. a negative relationship to the quantitative analysis skill). This ability requires an openness to collecting or being sensitive to all sorts of information and cues (i.e. a positive relationship to the information gathering skill).

.....
 '... Building quantitative analytic ability
 may extinguish or interfere with a
 person's verbal ability...'

Since learning skill was defined as a combination of ability, knowledge and *experience*, an association of the ESP scales and age might be expected. Boyatzis and Renio [27] reported significant correlations between age and planning, technology management, and setting and managing to goals skills ($r = 0.203$, $r = 0.225$, $r = 0.162$, respectively; $n = 148$, $p < 0.05$). Boyatzis *et al.* [28] reported a significant correlation between age and the adapting skill ($r = 0.268$, $n = 141$, $p < 0.05$). Dreyfus [31] reported significant correlations between age and relationship building, information gathering, setting and managing to goals and entrepreneurship skills ($r = 0.381$, $r = 0.417$, $r = 0.491$, $r = 0.440$, respectively; $n = 35$, $p < 0.05$). She also reported a negative correlation between age and quantitative analysis ($r = -0.337$, $n = 35$, $p < 0.05$) that is opposite to prediction. Therefore, eight of the 12 scales positively correlate with age, as expected.

Use of the ESP in developmental activities

The ESP has been used in providing personal feedback to individuals in a manufacturing company [30], a telecommunications company [29] and a research laboratory [31] as part of management development programmes. It has also been used in career

development, personal counselling sessions with physicians and physician executives [32,33]. People report the experience to be helpful in assessing their strengths and weaknesses and focusing their attention on areas to improve. In one setting, bosses' feedback with the ESP also provided managers with the opportunity to compare their expectations of the job demands with those of their bosses. This resulted in conversations with individual bosses about their perceptions of the manager's skills, and also the manager's expectations about the job.

The ESP has also been used in providing feedback to people regarding aspects of their organization as a whole. Boyatzis [34] reported its use with the faculty of a school of management. The feedback of the results to the faculty appeared to facilitate discussion of their collective objectives and the identification of a set of shared objectives of their programme. In this case, the results were also reviewed with other stakeholders in the organization, such as the school's advisory board, alumni association, administration and selected groups of students. In all sessions, the information appeared to stimulate discussion and provide a focus on the determination of the shared objectives or intent as to the MBA programme.

Summary

A typology of skills based on a framework of learning styles and experiential learning theory, rather than on a framework of job performance or some other personality construct, provided a language and guidance for development of an assessment method describing knowledge at the performance level of adaptation. It required development of the concept of learning skills which are:

- domain-specific and knowledge-rich;
- describing an integrated transaction between the person and environment; and
- developed by practice.

The ESP was designed to assess learning skills for management populations in business, education and health care through a typology of 12 skill scales. Data from numerous studies which established the ESP's reliability, relational validity, criterion validity,

ty and construct validity, were reviewed and reported.

Although many of the findings reviewed were consistent with the underlying learning framework, not all of them were. This suggests the need to re-examine the items in each scale in detail and to make revisions which have clearer representation of the underlying framework.

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'...Several of the findings reviewed suggested an impact of the organization, or corporate culture, on the ESP scores...'
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Further validation is needed. For example, several of the findings reviewed suggested an impact of the organization, or corporate culture, on the ESP scores. Studies are needed on the impact of reference groups, social networks, and organizational differences to determine the degree to which a person's ESP score reflects his/her socialization into an organizational culture.

The ESP with its contextual comparison can be used as a vehicle for providing personal and organizational feedback on skills and expectations and intent regarding skills in jobs and developmental programmes.

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