

Learning Cognitive and Emotional Intelligence Competencies Through Graduate Management Education

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A major challenge to MBA education is to develop the ability to use management knowledge. Entering and graduating data from six full-time and three part-time cohorts taking an MBA program designed to develop these competencies is analyzed and compared to baseline data on two full-time and two part-time cohorts. Results show that cognitive and emotional intelligence competencies can be developed in MBA students, but not with a typical MBA curriculum.

INTRODUCTION

One primary objective of graduate management education is to prepare people to be outstanding managers and leaders. This means helping people develop the functional, declarative, procedural, and metacognitive knowledge needed. For example, market segmentation for a new product, the time it takes a polymer to set, calculating the present value of a capital acquisition, and ethical principles as applied in international business transactions, respectively. This knowledge is necessary but not sufficient for the leader or manager to add value to organizations. In this sense, knowledge bases are threshold talents.

To be an effective manager or leader, a person needs the ability to use knowledge and to make things happen. These can be called competencies, which Boyatzis (1982) defined as "the underlying characteristics of a person that lead to or cause effective and outstanding performance" (p. 21). Whether direct empirical research is reviewed (Boyatzis, 1982; Bray, Campbell, & Grant, 1974; Howard & Bray, 1988; Kotter, 1982; Luthans, Hodgetts, & Rosenkrantz, 1988; Thornton & Byham, 1982) or meta-analytic syntheses are used (Campbell, Dunnette, Lawler, & Weick, 1970; Goleman, 1998; Spencer & Spencer, 1993), there are a set of competencies that have been shown to cause or

predict outstanding manager or leader performance. Regardless of author or study, they tend to include abilities from three clusters: (1) Cognitive or intellectual ability, such as systems thinking; (2) self-management or intrapersonal abilities, such as adaptability; and (3) relationship management or interpersonal abilities, such as networking. The latter two clusters make up what we call emotional intelligence competencies (Goleman, 1998).

Beyond knowledge and competencies, the additional ingredient necessary to outstanding performance appears to be the desire to use one's talent. This seems driven by a person's values, philosophy, sense of calling or mission, and unconscious motives and traits. These three domains of capability (i.e., knowledge, competencies, and motivational drivers) help us to understand *what* a person can do (i.e., knowledge), *how* a person can do it (i.e., competencies), and *why* a person feels the need to do it (i.e., values, motives, and unconscious dispositions).

Although many schools acknowledge the importance of competencies or skills in graduate management education, many faculty still see them as the responsibility of the career placement office or adjunct faculty hired to conduct noncredit workshops. The challenge today is to integrate the development of these competencies into the curricu-

lum as an essential element in its mission; in other words, to adopt the challenge of developing the whole person so that it is as fundamental to our objectives and methods as accounting. Instead of asking about what we were teaching, early attempts at outcome assessment were an effort to answer questions about what our students were learning. With funding from foundations and federal agencies in the U.S. outcome assessment began to spread in the early 1970s to innovative colleges and those concerned about "nontraditional" students (Mentkowski and Associates, 2000; Winter, McClelland, & Stewart, 1981). The early results were sobering, with only one clear conclusion—students graduating from our colleges were older than they were when they entered. Evidence was reported of knowledge acquisition, improvement in competencies—including critical thinking—and shifts in motivation, but these were far less frequent than was predicted or expected (Banta, 1993; Pascarella & Terenzini, 1991; Winter, McClelland, & Stewart, 1981).

Even before the humbling Porter and McKibbin Report (1988) showed that MBA graduates were not fulfilling the needs of employers or the promise of their schools, the AACSB started a series of outcome assessment studies in 1978. They showed faculty to be effective in producing significant student improvement with regard to some abilities (Boyatzis & Sokol, 1982; Development Dimensions International [DDI], 1985). Boyatzis and Sokol (1982) showed that students had significantly increased on 40–50% of the competencies assessed in two MBA programs, while DDI (1985) reported that students in the two MBA programs had significantly increased on 44% of the variables assessed. They also decreased significantly on 10% of the variables in the Boyatzis and Sokol study. When the overall degree of improvement in these abilities was calculated (Goleman, Boyatzis, & McKee, 2002), these studies showed about a 2% increase in emotional intelligence competencies in the 1–2 years students were in the MBA programs. Unfortunately, the samples were not random, and may have been subject to volunteer effects. Given the common criticisms directed at MBA graduates, it is difficult to believe that many MBA programs were attaining even those modest gains.

In terms of program impact, as of the early 1990s, only a few management schools had conducted student-change outcome studies that compared their students upon entry into the program and at graduation (Albanese et al., 1990). Many schools have conducted other types of outcome studies, namely studies of their alumni or studies with em-

ployers and prospective employers (Kridel, 1998). Some schools have examined the student change from specific courses (Bigelow, 1991; Specht & Sandlin, 1991). Student-change outcome studies have been a focus in undergraduate programs (Astin, 1993; Banta, 1993; Mentkowski et al., 1991; Mentkowski & Strait, 1983; Pascarella & Terenzini, 1991; Winter et al., 1981), but relatively little has been documented about the effects of graduate programs.

Hence the question, "Can MBAs and participants in executive education develop competencies related to outstanding managerial and leader performance?"

Methods

Overall Design

This study uses a combination of cross-sectional and longitudinal, time-series data collected as part of a 50-year longitudinal study of multiple cohorts of MBA students at the Weatherhead School of Management (WSOM), Case Western Reserve University. The longitudinal study focuses on the impact of the MBA program on the development of cognitive and emotional intelligence competencies. Since 1990, entering data have been collected during a required course, Leadership Assessment and Development (for a detailed description of the course and the longitudinal study, see Boyatzis, 1994, 1995; Boyatzis et al., 1995; Goleman, Boyatzis, & McKee, 2002). The course leads students through assessments and activities about their dreams and aspirations, current behavior, strengths and gaps as managers and leaders, and culminates in the writing of a learning plan. Students pursue the learning plan through the remainder of the program and afterward.

Data collected during years 1987–1989 reflect the results of students' development prior to revisions in the MBA program and are considered baseline samples. Many of the results of the 1987–1996 studies have been reported in conference presentations, books, and journal articles. This article is the first to present the combined results for cohorts graduating from 1988–1996 and introduces results for 2000 and 2001 cohorts.

The samples are described in Table 1. In the fall of 1990, the revised MBA program went into effect for all entering students. The graduating samples were randomly assigned to one assessment condition; therefore, not all students completed all of the instruments.

TABLE 1
Description of Samples and Populations for Cohorts in This Study

Cohort	Students Entering (N)	Permission (%)	Assessed (n)	Students Graduating (N)	Assessed (n)	Female (%)	Average Age at Entry
1987-1988 FT	100	100 ^a	72	61	27 ^b	31	26
1988 PT	260 ^c	100 ^a	26 ^b	45 ^c	23 ^b	35	26
1988-1989 FT	89	100 ^a	70	71	17 ^b	31	26
1989 PT	75 ^c	100 ^a	22 ^b	72	26 ^b	48	26
1990-1992 FT	124	87	108	96 ^d	71	37	27
1991-1993 FT	105	79	83	71 ^d	58	30	27
1992-1994 FT	137	76	104	127 ^d	58	45	27
1994 PT	230 ^c	86	198	160	21	52	28
1993-1995 FT	140	89	125	146	77	35	27
1995 PT	235 ^c	86	202	124	35	34	27
1996 PT		83		162	35	17	27
1998-2000 FT	189	47	89	191	56 ^e	25	29
1999-2001 FT	173	82	142	169	123 ^e	35	27

Note. FT = full time; PT = part time.

^a Assessment was considered voluntary, but not everyone appeared at the orientation program for the full-time students. For the randomly selected samples, participation was voluntary, so all assessed had given their permission.

^b All randomly selected samples were comparable to the populations from which they were drawn as to age, gender, GMAT, undergraduate GPA and percentage of international students.

^c Students entered in January, June, and August. The graduating samples were taken from those graduating in May only.

^d Some entering students did not graduate due to working toward a joint degree (e.g., MBA/JD) or transferring to the part-time program. Of those that permitted their data to be included in the study, some students were dropped from the final sample due to various unforeseen circumstances (e.g., incomplete assessments).

^e In 1997, participation in exit assessment near graduation became a required part of the program for full-time students. Of the sample granting permission to use their entering and graduating data in research, we were only able to recover part of the sample due to losses in two computer crashes. Part-time students were not approached for exit assessment.

Instruments

All the instruments assessed competencies. The Learning Skills Profile (LSP) is a card sort based on experiential learning theory (Kolb, 1984; see Boyatzis & Kolb, 1991 and 1995 for a discussion of the instrument's reliability and validity). Individuals place each of 72 skill statements into one of seven stacks reflecting their own level of the skill. The stacks are labeled: 1 = no skill or experience in this area; 2 = now learning this skill or activity; 3 = can do this with some help or supervision; 4 = a competent performer in this area; 5 = an above-average performer in this area; 6 = an outstanding performer in this area; and 7 = a leader or creator in this area. The 72 skill statements constitute 12 scales: Leadership, Relationship, and Helping, considered relationship-management competencies; Sense-Making, Information-Gathering, Information Analysis, Theory-Building, Quantitative, and Technology, considered cognitive competencies; and Goal-Setting, Action, and Initiative, considered self-management competencies. The total score of all 12 scales is said to reflect Self-Confidence (Boyatzis & Kolb, 1991, 1995), which was also considered a self-management competency.

The Critical Incident Interview (CII) is a 1-hour, audiotaped interview (Boyatzis, 1982; Flanagan,

1954; Spencer & Spencer, 1993) in which individuals are asked to describe in detail, two work experiences in which they felt effective and two experiences in which they felt ineffective. The tapes were coded for 16 competencies: Efficiency Orientation, Planning, Initiative, Attention-to-Detail, Self-Control, Flexibility, and Self-Confidence, considered self-management competencies; Empathy, Social Objectivity, Persuasiveness, Networking, Negotiating, Group Management, and Developing Others, considered relationship-management competencies; and Systems-Thinking and Pattern Recognition, considered cognitive competencies. Two or three people independently coded the interviews. In this research, the coders averaged 89-90% interrater reliability on the 16 competencies.

The Group Discussion Exercise (GDE) is a 45-minute, videotaped simulation. Participants are given a set of three problems encountered by their hypothetical management team and asked to make recommendations to the CEO. The videotapes were coded for the same 16 competencies as the CII by the same coders. In this case, two people who have already established the interrater reliability code the videotapes.

The Presentation Exercise (PE) is an assessment of an individual's oral communication ability. In

the exercise, an individual is asked to deliver a 10-minute speech about an organization in which they would like to work or that interests them. They are asked to view this as a recruiting talk to MBAs. The 10-minute presentation is followed by a 5-minute question-and-answer session. The 15-minute exercise was videotaped and later coded for the oral communication competency, which is part of the relationship-management cluster and Enthusiasm. Two independent coders had an inter-rater reliability greater than 70%.

The Self-Assessment Questionnaire (SAQ) is a 73-item questionnaire in which the participants are asked to assess the frequency with which they demonstrate each behavior. The items assess 21 competencies: Efficiency Orientation, Planning, Initiative, Attention-to-Detail, Self-Control, Flexibility, and Self-Confidence, considered self-management competencies; Empathy, Social Objectivity, Persuasiveness, Networking, Negotiating, Group Management, Developing Others, and Oral Communication, considered relationship-management competencies; and Use-of-Concepts, Systems-

Thinking, Pattern Recognition, Quantitative Analysis, Use-of-Technology, and Written Communication, considered cognitive competencies.

The External Assessment Questionnaire (EAQ) is a version of the SAQ in which students ask others about their behavior. The others may include a boss, work colleagues, subordinates, professionals, family, fellow students, or friends. The EAQ responses ranged from 1 to 8 others (an average of 3.3 and median of 3.0 others). It was not known as to how many of these "others" providing the information at entry were the same as those providing information near graduation from the program.

Results

Using the self-report, Learning Skills Profile, as shown in Table 2, full-time MBAs statistically and near significantly improved on Leadership, Relationship, Helping, Sense-Making, Information-Gathering, Information Analysis, Theory-Building, Quantitative, Technology, Goal-Setting, Action and Initiative skills, and Self-Confidence, derived

TABLE 2
Comparison of Full-Time Entering and Graduating Students' Scores on the Learning Skills Profile

Skill Scale	1987-1988 <i>n</i> = 72-27 ^a	1988-1989 <i>n</i> = 70-23 ^a	1990-1992 <i>n</i> = 71 ^b	1991-1993 <i>n</i> = 55 ^b	1992-1994 <i>n</i> = 54 ^b	1993-1995 <i>n</i> = 73 ^b	1998-2000 <i>n</i> = 56 ^b	1999-2001 <i>n</i> = 123 ^b
Leadership	23.8-24.7 <i>z</i> = -.45	25.7-26.0 <i>z</i> = -.50	27.7-27.2 <i>t</i> = .70	25.1-27.1 <i>t</i> = -2.55**	26.8-28.0 <i>t</i> = -1.66*	26.5-28.3 <i>t</i> = -2.46**	25.7-29.1 <i>t</i> = -4.3***	25.8-27.5 <i>t</i> = -3.2***
Relationship	28.3-29.7 <i>z</i> = -1.44†	29.8-31.6 <i>z</i> = -1.23	30.0-30.4 <i>t</i> = -.69	29.3-30.5 <i>t</i> = -1.88*	31.9-31.0 <i>t</i> = 1.40†	30.5-30.7 <i>t</i> = -.32	29.4-32.2 <i>t</i> = -3.6***	28.7-30.4 <i>t</i> = -3.5***
Helping	25.8-26.4 <i>z</i> = -.61	27.4-29.1 <i>z</i> = -.97	27.7-28.9 <i>t</i> = -1.71*	27.8-28.8 <i>t</i> = -1.33†	27.6-29.3 <i>t</i> = -2.10*	28.5-29.3 <i>t</i> = -1.25	26.8-31.1 <i>t</i> = -5.0***	26.5-29.2 <i>t</i> = -5.3***
Sense-Making	25.9-28.4 <i>z</i> = -1.86*	27.2-27.6 <i>z</i> = -.58	27.5-28.7 <i>t</i> = -1.79*	26.2-28.4 <i>z</i> = -3.51***	26.3-28.1 <i>t</i> = -2.47**	27.0-28.4 <i>t</i> = -2.33**	26.9-30.9 <i>t</i> = -5.0***	26.2-28.7 <i>t</i> = -5.4***
Information-Gathering	24.5-27.5 <i>z</i> = -3.49***	27.2-28.5 <i>z</i> = -1.43†	26.7-28.3 <i>t</i> = -2.82**	25.9-27.9 <i>t</i> = -2.44**	25.7-28.7 <i>t</i> = -4.14***	26.0-28.7 <i>t</i> = -4.35***	26.9-29.7 <i>t</i> = -3.7***	25.8-28.3 <i>t</i> = -4.6***
Information Analysis	22.9-28.6 <i>z</i> = -4.20***	23.5-27.9 <i>z</i> = -3.43***	26.7-28.6 <i>t</i> = -3.25***	26.3-29.2 <i>t</i> = -4.66***	25.1-28.6 <i>t</i> = -4.81***	25.8-29.6 <i>t</i> = -6.24***	25.5-30.6 <i>t</i> = -6.3***	26.0-29.1 <i>t</i> = -5.9***
Theory-Building	19.9-24.7 <i>z</i> = -3.70***	21.5-25.1 <i>z</i> = -3.54***	25.2-27.4 <i>t</i> = -3.42***	22.9-27.2 <i>t</i> = -5.55***	22.5-26.4 <i>t</i> = -4.64***	23.8-27.0 <i>t</i> = -4.63***	25.0-29.6 <i>t</i> = -5.2***	25.2-28.2 <i>t</i> = -6.2***
Quantitative	19.1-26.7 <i>z</i> = -4.99***	18.4-25.5 <i>z</i> = -4.33***	22.1-26.3 <i>t</i> = -4.82***	21.5-27.5 <i>t</i> = -6.86***	20.6-25.9 <i>t</i> = -5.40***	22.0-27.1 <i>t</i> = -6.39***	21.1-28.0 <i>t</i> = -7.5***	24.0-27.3 <i>t</i> = -6.1***
Technology	18.0-23.0 <i>z</i> = -3.79***	18.6-22.9 <i>z</i> = -1.91*	21.5-25.5 <i>t</i> = -4.00***	20.7-25.2 <i>t</i> = -4.39***	18.9-25.0 <i>t</i> = -6.00***	19.6-24.5 <i>t</i> = -6.30***	21.3-27.9 <i>t</i> = -7.8***	24.8-27.2 <i>t</i> = -4.2***
Goal-Setting	23.8-25 <i>z</i> = -.65	25.1-25.4 <i>z</i> = -.07	26.8-28.4 <i>t</i> = -2.65**	27.0-28.9 <i>t</i> = -2.30*	26.2-29.1 <i>t</i> = -4.80***	26.8-29.0 <i>t</i> = -3.19***	25.8-29.4 <i>t</i> = -4.4***	25.6-28.4 <i>t</i> = -5.2***
Action	25.6-27.9 <i>z</i> = -2.37**	28.0-27.6 <i>z</i> = -.42	30.3-30.3 <i>t</i> = .09	29.2-30.1 <i>t</i> = -1.30†	29.1-30.5 <i>t</i> = -2.30**	29.2-30.5 <i>t</i> = -1.93*	27.7-30.8 <i>t</i> = -3.9***	27.0-29.9 <i>t</i> = 5.2***
Initiative	27.3-30.1 <i>z</i> = -2.37**	29.1-29.7 <i>z</i> = -.52	29.4-29.8 <i>t</i> = -.62	27.7-29.1 <i>t</i> = -1.81*	28.9-30.3 <i>t</i> = -1.87*	28.7-30.1 <i>t</i> = -1.87*	28.3-30.9 <i>t</i> = 3.2***	27.9-29.6 <i>t</i> = -3.0**
Total (Self-Confidence)	285-323 <i>z</i> = -4.05***	302-327 <i>z</i> = -2.30**	322-340 <i>t</i> = -3.33***	310-340 <i>t</i> = -5.12***	310-341 <i>t</i> = -5.12***	315-343 <i>t</i> = -5.00***	310-360 <i>t</i> = -7.50***	313-344 <i>t</i> = -7.06***

^a Mann-Whitney U-tests were run with the *z* reported because the comparison was of groups of dramatically different sample size.

^b Matched-pair *t*-tests were run with the *t* reported because a longitudinal design was used. Significance levels are one-tailed: † *p* < .10; * *p* < .05; ** *p* < .01; *** *p* < .001.

from the total. Meanwhile, in the two baseline years, full-time MBAs only showed statistically significant or near significant improvement on Relationship, Sense-Making, Action, and Initiative skills in one cohort. They improved on Information-Gathering, Information Analysis, Theory-Building, Quantitative, and Technology skills and Self-Confidence in both cohorts. When results were calculated for native English speakers only, four findings became nonsignificant: Relationship skills in 1988 and 1994, Information-Gathering skills in 1989, and Sense-Making skills in 1992. All other results remained in the same direction and significant or near significant. Both significant and near significant results are reported to show the overall pattern of findings across the multiple cohorts and multiple measures.

Using the Learning Skills Profile, as shown in Table 3, part-time MBAs statistically, significantly, or near significantly improved on Leadership, Relationship, Helping, Sense-Making, Information-Gathering, Information Analysis, Theory-Building, Quantitative, Technology, Goal-Setting, Action, and Initiative skills, and Self-Confidence. Mean-

while, in the two baseline years, full-time MBAs only showed statistically significant or near significant improvement on Theory-Building and Quantitative skills in only one cohort. There were no non-native English speakers in the part-time program.

To assess behavioral change directly, analysis of the results from the Critical Incident Interviews showed that full-time MBAs statistically, significant, or near significant improved on Efficiency Orientation, Planning, Initiative, Attention to Detail, Self-Control, Flexibility, Self-Confidence, Empathy, Networking, Negotiating, Group Management, Systems-Thinking, Pattern Recognition, and Social Objectivity. Results for Persuasiveness were opposite to the predicted direction for the 1995 cohort. When results were calculated for native English speakers only, efficiency orientation in 1995 became nonsignificant. All other results remained in the same direction and significant or near significant (see Table 4).

Analysis of the results from the Critical Incident Interviews showed that part-time MBAs statisti-

TABLE 3
Comparison of Part-Time Entering and Graduating Students' Scores on the Learning Skills Profile

Skill Scale	1987-1988 <i>n</i> = 26-23 ^a	1988-1989 <i>n</i> = 22-26 ^a	1990-1994 <i>n</i> = 21 ^b	1990-1995 <i>n</i> = 32 ^b	1993-1996 <i>n</i> = 35 ^b
Leadership	25.7-25.7 <i>z</i> = -.03	25.5-26.4 <i>z</i> = -.49	25.2-28.3 <i>t</i> = -2.63**	25.5-28.3 <i>t</i> = -2.79**	24.3-25.7 <i>t</i> = -1.19
Relationship	28.7-28.4 <i>z</i> = -.17	30.6-30.2 <i>z</i> = -.02	29.0-31.3 <i>t</i> = -2.36*	29.3-31.0 <i>t</i> = -2.00*	29.1-28.5 <i>t</i> = .54
Helping	25.2-26.0 <i>z</i> = -.50	27.6-28.1 <i>z</i> = -.25	25.5-28.3 <i>t</i> = -2.42**	26.6-28.3 <i>t</i> = -1.94*	26.5-27.2 <i>t</i> = -.86
Sense-Making	27.0-27.2 <i>z</i> = -.12	28.2-28.2 <i>z</i> = -.28	24.7-28.6 <i>t</i> = -4.05***	26.7-28.6 <i>t</i> = -2.99**	25.8-27.1 <i>t</i> = -1.31†
Information-Gathering	26.7-24.9 <i>z</i> = -1.49	27.1-28.8 <i>z</i> = -.88	24.0-28.0 <i>t</i> = -3.20**	25.6-27.5 <i>t</i> = -2.58**	25.1-26.8 <i>t</i> = -1.89*
Information Analysis	26.6-27.5 <i>z</i> = -.63	26.4-27.7 <i>z</i> = -.72	26.0-29.9 <i>t</i> = -4.49***	26.9-29.2 <i>t</i> = -2.38**	27.3-29.5 <i>t</i> = -2.51**
Theory-Building	22.7-24.9 <i>z</i> = -1.34	22.0-25.5 <i>z</i> = -1.69*	22.4-26.2 <i>t</i> = -3.01**	24.3-25.8 <i>t</i> = -1.16	24.3-27.5 <i>t</i> = -3.33***
Quantitative	23.7-26.0 <i>z</i> = -1.30	21.8-24.7 <i>z</i> = -1.28†	20.1-24.8 <i>t</i> = -3.96***	22.5-26.3 <i>t</i> = -2.77**	25.5-28.9 <i>t</i> = -3.11**
Technology	23.5-22.4 <i>z</i> = -.71	25.5-22.9 <i>z</i> = -1.41	21.6-26.6 <i>t</i> = -4.22***	22.9-26.3 <i>t</i> = -2.64**	25.9-28.2 <i>t</i> = -2.05*
Goal-Setting	24.1-24.9 <i>z</i> = -.32	25.5-24.9 <i>z</i> = -.29	25.7-29.4 <i>t</i> = -3.53***	24.9-29.2 <i>t</i> = -4.66***	25.7-27.6 <i>t</i> = -2.06*
Action	26.7-28.4 <i>z</i> = -1.33	27.3-27.2 <i>z</i> = -.07	30.1-32.8 <i>t</i> = -2.52*	28.9-31.4 <i>t</i> = -2.18*	27.6-28.5 <i>t</i> = -1.14
Initiative	28.7-29.2 <i>z</i> = -.74	30.1-29.9 <i>z</i> = -.05	29.1-33.1 <i>t</i> = -3.70***	29.5-30.4 <i>t</i> = -1.02	27.1-28.8 <i>t</i> = -1.73*
Total (Self-Confidence)	309-316 <i>z</i> = -.74	318-324 <i>z</i> = -.33	304-347 <i>t</i> = -4.90***	314-342 <i>t</i> = -3.62***	314-334 <i>t</i> = -2.88**

^a Mann-Whitney U-tests were run with the *z* reported because the comparison was of groups of different sample size.

^b Matched-pair *t*-tests were run with the *t* reported because a longitudinal design was used. Significance levels are one-tailed: † *p* < .10; * *p* < .05; ** *p* < .01; *** *p* < .001.

TABLE 4
Comparison of Full-Time Entering and Graduating Students' Abilities From the Critical Incident Interviews

Ability	Entering 1991-1993	Graduate (n = 34)	z^a	Entering 1992-1994	Graduate (n = 18)	z^a	Entering 1993-1995	Graduate (n = 55)	z^a
Efficiency Orientation	1.26	1.91	-2.90**	1.94	2.33	-1.35 [†]	2.07	2.38	-1.53 [†]
Planning	1.35	2.00	-2.87**	1.72	2.50	-2.40**	2.33	2.91	-3.22***
Initiative	.68	1.24	-2.48**	.78	.61	-.66	1.15	1.33	-1.19
Attention to Detail	.44	.29	-1.29	.33	.44	-.71	.40	.73	-2.43**
Self-Control	.09	.35	-1.83*	.28	.56	-1.23 [†]	.42	.53	-.98
Flexibility	.06	.38	-2.67**	.28	.39	-.71	.07	.20	-1.94*
Self-Confidence	.38	.65	-2.71**	.61	.94	-2.45**	.58	.75	-2.18**
Empathy	.47	.82	-2.01*	1.56	1.50	.00	1.33	1.42	-.60
Social Objectivity	.12	.32	-1.49 [†]	.67	.56	-.50	.22	.47	-2.01*
Persuasiveness	1.59	1.44	-.75	2.61	2.22	-1.46	2.56	2.13 ^b	-2.38*
Networking	.24	.74	-3.39***	.67	.78	-.37	.93	1.16	-1.43 [†]
Negotiating	.03	.06	-.58	.00	.06	-1.00	.05	.18	-1.75*
Group Management	.03	.24	-2.65**	.17	.22	-.45	.15	.36	-2.83**
Developing Others	.53	.38	-1.15	.61	.33	-1.03	.51	.44	-.49
Systems-Thinking	.29	.56	-2.07*	.78	.50	-1.20	.93	.91	-.15
Pattern Recognition	.21	.56	-2.45**	.83	.89	-.25	.73	1.18	-2.59**

Note. Numbers are for entire sample. Significance levels and z scores may have changed slightly from earlier publications due to a change in the formula used by SPSS starting with SPSS 7.0 as compared to earlier versions.

^aSignificance levels are one-tailed tests based on a Wilcoxon matched-pairs signed-ranks test: [†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

^bA two-tailed significance level because it was in the opposite direction to that predicted.

cally significant, or near significantly improved on Efficiency Orientation, Initiative, Attention to Detail, Flexibility, Self-Confidence, Networking, Negotiating, Group Management, Developing Others, Systems-Thinking, Pattern Recognition, and Social

Objectivity (see Table 5). There were no nonnative English speakers in the part-time program.

Another direct measure of behavior change was the Group Discussion Exercise. Results from analyzing these videotapes showed full-time MBAs

TABLE 5
Comparison of Part-Time Entering and Graduating Students' Abilities From the Critical Incident Interviews

Ability	Entering 1990-1995	Graduate (n = 20)	z^a	Entering 1993-1996	Graduate (n = 34)	z^a
Efficiency Orientation	2.10	2.70	-1.75*	1.50	1.97	-2.00*
Planning	2.25	2.65	-1.04	2.38	2.62	-.88
Initiative	1.25	1.60	-1.73*	.74	.85	-.58
Attention to Detail	.40	.90	-1.90*	.44	.35	-.49
Self-Control	.35	.40	-.45	.47	.65	-1.05
Flexibility	.00	.40	-2.53**	.12	.24	-1.27 [†]
Self-Confidence	.75	.95	-2.00**	.82	.94	-1.63*
Empathy	1.30	1.35	-.27	1.74	2.09	-1.24
Social Objectivity	.40	.65	-1.23	.53	.91	-2.12*
Persuasiveness	2.35	2.70	-.96	2.44	2.38	-.12
Networking	.60	1.25	-2.37**	.76	.65	-.64
Negotiating	.00	.20	-1.63*	.18	.24	-.54
Group Management	.10	.35	-1.41 [†]	.18	.15	-.28
Developing Others	.60	.45	-.45	.35	.56	-1.51 [†]
Systems-Thinking	1.10	1.20	-.37	1.09	1.50	-1.95*
Pattern Recognition	.60	1.05	-1.69*	.79	.88	-.61

^aSignificance levels are one-tailed tests based on a Wilcoxon matched-pairs signed-ranks test: Significance levels and z scores may have changed slightly from earlier publications due to a change in the formula used by SPSS starting with SPSS 7.0 as compared to earlier versions.

[†] $p < .10$; * $p < .05$; ** $p < .01$.

statistically significantly, or near significantly improved on Efficiency Orientation, Planning, Initiative, Self-Confidence, Empathy, Networking, Group Management, Systems-Thinking, and Pattern Recognition (see Table 6). They also showed a significant decrease in Initiative and Systems-Thinking for the 1994 cohort. When results were calculated for native English speakers only, both the results for Negotiating in 1994 and the opposite of predicted results for Persuasiveness in the class of 1994 became nonsignificant. All other results remained in the same direction and significant or near significant.

Analysis of another behavioral exercise from the Presentation Exercise videotapes showed that full-time MBAs improved statistically, significantly on Oral Communication and Enthusiasm both of the years assessed (see Table 7).

The graduating class of 2001 completed two additional assessments: (1) a behavioral assessment by others, the EAQ; and (2) another self-assessment, the SAQ. Students appeared to be more critical of their own growth as compared to others who assessed them on the same competencies. Others viewed their improvement through the External Assessment Questionnaire. As shown in Table 8, students statistically significantly improved on each of the 21 competencies. From the Self-Assessment Questionnaire, students significantly or near

significantly improved on 15 of the 21 competencies: Planning, Initiative, Attention to Detail, Self-Control, Flexibility, Self-Confidence, Empathy, Persuasiveness, Negotiating, Oral Communication, Pattern Recognition, Use of Concepts, Quantitative Analysis, Use of Technology, and Written Communication. When results were calculated for the native English-speaking sample only, Planning, Use of Concepts, and Use of Technology became nonsignificant. All other results remained in the same direction and either increased in significance or remained significant or near significant.

Discussion

In contrast to earlier studies, it appears that MBAs can develop emotional intelligence and cognitive competencies crucial to effectiveness as managers and leaders during their programs. The research question posed in this article is supported by the multimethod, multitrait, multicohort data offered. The results from the six cohorts of full-time and three cohorts of the part-time students assessed with the Learning Skills Profile are summarized and shown in Tables 9 and 10. The results from the three cohorts of the full-time and two cohorts of the part-time students assessed with the Critical Incident Interview, the three cohorts of the full-time students assessed with the Group Discussion Ex-

TABLE 6
Comparison of Full-Time Entering and Graduating Students' Abilities From the Group Discussion Exercise

Ability	Entering 1990-1992	Graduate (n = 20)	z	Entering 1991-1993	Graduate (n = 30)	z	Entering 1992-1994	Graduate (n = 26)	z
Efficiency Orientation	.40	.60	-.97	.40	.87	-2.10*	.73	.42	-1.20
Planning	.55	.95	-1.81*	.27	.70	-2.50**	1.31	1.12	-.60
Initiative	.90	1.35	-1.64*	1.33	1.30	-.18	.96	.50	-2.29** ^a
Attention to Detail	.10	.15	-.45	.07	.10	-.38	.42	.27	-.67
Self-Control	.00	.00	-.45	.00	.00	-.38	.00	.00	-.67
Flexibility	.00	.00	-.45	.00	.00	-.38	.00	.00	-.67
Self-Confidence	.40	.60	-2.00*	.43	.63	-1.73*	.73	.69	-.33
Empathy	.00	.20	-2.00*	.00	.07	-1.41 [†]	.23	.50	-2.11*
Social Objectivity	.00	.05	-1.00	.03	.00	-1.00	.04	.12	-1.00
Persuasiveness	.15	.25	-.82	.30	.40	-.91	1.19	.88	-1.38
Networking	.00	.20	-2.00*	.00	.07	-1.41 [†]	.00	.00	-1.38
Negotiating	.05	.00	-1.00	.03	.03	.00	.00	.00	-1.38
Group Management	.05	.15	-1.41 [†]	.00	.00	-1.73	.19	.08	-1.00
Developing Others	.00	.10	-1.00	.03	.00	-1.00	.04	.04	.00
Systems-Thinking	.15	.25	-.82	.03	.17	-1.63*	.85	.35	-2.81***
Pattern Recognition	.20	.50	-2.12*	.10	.40	-2.32*	.58	.31	-1.81

Note. Numbers are for entire sample. Significance levels are one-tailed tests based on a Wilcoxon matched-pairs signed-ranks test: [†] $p < .10$; * $p < .05$; ** $p < .01$.

The Wilcoxon test was appropriate because of the non-normal distribution of the behavioral coding in the Group Discussion Exercise (GDE). Significance levels and z scores may have changed slightly from earlier publications due to a change in the formula used by SPSS starting with SPSS 7.0 as compared to earlier versions.

^a A two-tailed significance level because it was in the opposite direction to that predicted.

TABLE 7

Comparison of Full-Time Entering and Graduating Students' Abilities From the Presentation Exercise

Ability	n	Entering 1990-1992	Graduate	t ^a	n	Entering 1991-1993	Graduate	t ^a
Oral Communication (total score)	24	4.25	6.25	-5.54***	16	4.69	5.31	-1.99*
Enthusiasm	24	3.00	3.96	-4.18***	15	1.93	2.40	-1.97*

Note. Numbers are for entire sample.

^a Significance levels are for paired-sample *t*-tests as one-tailed tests: * $p < .05$; *** $p < .001$.

ercise, and two cohorts of the full-time students assessed with the Presentation Exercise are summarized and shown in Tables 11 and 12. Also shown in Tables 9 and 10 are the time-series comparisons to the impact of the earlier MBA program at WSOM before the changes implemented in 1990.

The summaries show a dramatic improvement over the impact of the baseline program in all three clusters, for both the full-time and the part-time students. As mentioned earlier, the baseline impact of the WSOM MBA program was consistent with earlier AACSB studies (Boyatzis & Sokol, 1982; DDI, 1985) and the Porter and McKibbin Report (1988)—MBA programs primarily improve a person's analytic ability. Although these results are important to managerial and leadership effectiveness, they are only part of the recipe for outstanding performance and contribution to organizations. In contrast to some faculty fears, improvements in emotional intelligence abilities did not detract from the improvement of cognitive abilities and may have even enhanced development of critical thinking ability.

The differences between the impact of the program shown in Tables 9 and 10 versus 11 and 12 may reveal a difference between self-report and behavioral changes observed by others. This could be the result of different standards, perceptions, or developmental progress; that is, the difference between the behavior others see and what a person senses within may be a function of different processes. For example, people may feel they have changed a great deal, but the change is too small to be apparent to others.

Some competencies are easier to observe than others. For instance, the behaviors coded for Systems-Thinking are remarkably similar to the items in the Information Analysis scale of the Learning Skills Profile. There was strong and consistent improvement on Information Analysis but uneven direct behavioral results with Systems-Thinking. As a cognitive ability, Systems-Thinking may be more difficult to observe in someone's behavior than behavior related to planning or influ-

encing others. If people do not express their thoughts, it is impossible to code them in direct behavioral measures.

Another possibility is that people may sense a change in themselves before they show this in their behavior, or show it consistently enough for others to notice. Rhee (1997) interpreted this as a sensitization effect. He studied 22 of the full-time graduates of the 1995 cohort by interviewing and testing them about every 6 weeks throughout their 2-year program. His sample showed dramatic improvement on all of the scales in the Learning Skills Profile and direct behavioral results slightly less than the overall 1995 sample shown in Tables 4 and 6, which were considerably less dramatic than the self-report results.

The disparity could have been the result of the Hawthorne Effect, or the result of cognitive dissonance reduction. An MBA might think "I have spent all this time and money, I must have changed." But that would cause a self-justifying distortion in the self-report data, not the direct behavioral data. Regardless of the causes of the observed differences, the multimethod, multicohort results provide increased confidence when we observe results from both self-report and measures directly assessing behavior demonstrated in audiotapes of work samples and videotapes of their behavior in simulations.

There also may be cohort effects. For example, the class graduating in 1994 appeared to improve on fewer of the competencies than other cohorts. This was consistent on both direct behavioral measures. Further, this cohort showed a significant decrease on Initiative and Systems-Thinking as assessed through the Group Discussion Exercise. It is not clear to those of us involved in the program during these years why this particular cohort should have shown this difference, but internal group dynamics may have affected their learning.

Another way to examine this difference is with the same measure used as a self-report and as an assessment of the behavior others see. The full-time graduates of 2001 completed the self-assess-

TABLE 8
Comparison of Full-Time Entering and
Graduating MBA Students' Scores on the EAQ
and SAQ

Skill Scale	EAQ 1999-2001 (n = 80)	SAQ 1999-2001 (n = 71)
Efficiency Orientation	2.3-3.3 $t = -10.0^{***}$	3.0-3.0 $t = -1.1$
Planning	2.3-3.2 $t = -8.6^{***}$	2.8-2.9 $t = -1.7^*$
Initiative	2.0-3.0 $t = -10.8^{***}$	2.4-2.7 $t = -2.6^{**}$
Attention to Detail	2.4-3.2 $t = -8.3^{***}$	2.7-2.9 $t = -2.3^{**}$
Self-Control	2.1-3.0 $t = -10.0^{***}$	2.6-2.8 $t = -2.8^{**}$
Flexibility	2.2-3.1 $t = -8.6^{***}$	2.9-3.0 $t = -2.1^*$
Self-Confidence	2.1-3.1 $t = -8.9^{***}$	2.5-2.7 $t = -2.9^{**}$
Empathy	2.3-3.2 $t = -9.5^{***}$	3.1-3.2 $t = -2.0^*$
Social Objectivity	2.1-3.1 $t = -10.0^{***}$	3.0-3.0 $t = -0.6$
Persuasiveness	2.1-3.0 $t = -10.1^{***}$	2.7-2.8 $t = -2.6^{**}$
Networking	2.3-3.3 $t = -8.6^{***}$	2.9-3.0 $t = -0.9$
Negotiating	2.1-3.1 $t = -9.2^{***}$	2.8-2.9 $t = -1.5^{\dagger}$
Group Management	2.2-3.1 $t = -11.1^{***}$	2.7-2.8 $t = -0.9$
Developing Others	2.2-3.1 $t = -9.5^{***}$	2.7-2.7 $t = -0.8$
Oral Communication	2.3-3.3 $t = -10.5^{***}$	2.9-3.1 $t = -4.4^{***}$
Use of Concepts	2.2-3.1 $t = -9.8^{***}$	2.7-2.8 $t = -1.6^{\dagger}$
Systems-Thinking	2.1-3.1 $t = -8.6^{***}$	2.6-2.7 $t = -0.8$
Pattern Recognition	2.0-3.0 $t = -10.1^{***}$	2.5-2.7 $t = -2.9^{**}$
Quantitative Analysis	2.0-3.2 $t = -7.8^{***}$	2.4-2.8 $t = -2.8^{**}$
Use of Technology	2.0-3.0 $t = -7.7^{***}$	2.3-2.5 $t = -1.5^{\dagger}$
Written Communication	2.4-3.4 $t = -10.2^{***}$	3.0-3.2 $t = -3.9^{***}$

Note. Matched-pair t -tests were run with the t reported because a longitudinal design was used. Significance levels are one-tailed: $^{\dagger} p < .10$; $^* p < .05$; $^{**} p < .01$; $^{***} p < .001$.

ment on the competencies, as well as having others around them use the same questionnaire, effectively completing a partial 360 assessment (see Table 8). Others saw the students significantly improving on all 21 of the competencies assessed, including competencies from all three clusters. Meanwhile, in contrast to the data summarized above, the self-report showed significant improvement on only 12 competencies, and near-signifi-

cant improvement on an additional 3 competencies. These results contradict some of the possible explanations offered for the reversed difference shown among the earlier cohorts. The competencies on which the MBAs in the 2001 graduating cohort *did not* see themselves improving included: Efficiency Orientation, Networking, Group Management, Developing Others, Social Objectivity, and Systems-Thinking.

The part-time program does not appear to have the same degree of impact on competency improvement as the full-time program. Faculty had thought the work context of the part-time students would have enhanced the learning from the program; it did not. There are three possible explanations. First and foremost, we only assessed two samples of the part-time MBAs with direct behavioral measures (and that was only one measure), as compared to the eight full-time samples assessed with these measures. Another explanation for the differential impact is the concentrated aspects of the full-time program. Even though the full- and part-time students take most electives together, full-time students are brought into the program and separated from their current work context. This break from their old reality, although a source of anxiety, also frees them from having the constant reminder to use old habits. It is also possible that the work settings of the part-time students extinguish both new behavior, and their attempts to use new things learned in the program.

The increased impact of the program shown in the time-series results may have been the result of factors other than the curriculum change. A review of the full-time faculty teaching in the school showed that from 1988/1989 to 1993/1995, 67% of the faculty were the same. Although the program did not change its admissions procedures and criteria during this period, as the new program became known it resulted in applications and enrollment by students with higher scores on measures such as GMAT, undergraduate GPA, the percentage of females in the program, and higher scores on some of the competencies measures used across the cohorts in the time series. Even with this increase in entering ability, the improvements noted after the program changed were significant and dramatic. So these aspects of the school and program did not appear to have an impact on competency improvement.

These results are comparable to those obtained in longitudinal studies of 45-55-year-old executives and advanced professionals in WSOM's executive education Professional Fellows Program (Ballou, Bowers, Boyatzis, & Kolb, 1999). The program had been designed for later, midcareer pro-

TABLE 9
Summary of the Time-Series Results of Learning Skills for Full-Time MBAs

Evidence of Value Added	1987-1989 Program			1990-2001 Program		
	Self-Management	Relationship Management	Cognitive	Self-Management	Relationship Management	Cognitive
Strong improvement ^a	Self-confidence		Information analysis Theory-building Quantitative analysis Use of technology	Goal-setting Action Initiative Self-confidence	Leadership Helping	Sense-making Information-gathering Information analysis Theory-building Quantitative analysis Use of technology
Some improvement ^b	Action Initiative		Information-gathering Sense-making		Relationship	
No improvement	Goal-setting	Leadership Relationship Helping				

Note. Adjusted for native English speaking as well as the entire sample.

^a Strong improvement is classified as significant or near significant improvement on two thirds of the cohorts assessed.

^b Some improvement is classified as significant or near significant improvement on one or more up to one third of the cohorts assessed.

professionals using many of the same curriculum components as the post-1990 MBA program. Using the Learning Skills Profile, two cohorts showed significant improvement in Helping, Information-Gathering, Theory-Building, Use-of-Technology, and Goal-Setting skills, as well as Self-Confidence from the total score. One of the two showed significant improvement in Sense-Making, Quantitative Analysis, and action skills as well.

What caused these dramatic improvements in cognitive and emotional intelligence competencies from the MBA program? Unfortunately, we did not have a research design in place to make specific attributions, but the components of the MBA program that changed from the earlier program included (1) an explicit philosophy of education and pedagogy (Boyatzis, Cowen, & Kolb, 1995); (2) a course on leadership assessment and develop-

TABLE 10
Summary of the Time-Series Results of Learning Skills for Part-Time MBAs

Evidence of Value Added	1987-1989 Program			1990-1996 Program		
	Self-Management	Relationship Management	Cognitive	Self-Management	Relationship Management	Cognitive
Strong improvement ^a				Goal-setting Action Initiative Self-confidence	Leadership Relationship Helping	Sense-making Information-gathering Information analysis Theory-building Quantitative analysis Use of technology
Some improvement ^b			Quantitative analysis Theory-building			
No improvement	Goal-setting Action Initiative Self-confidence	Leadership Relationship Helping	Sense-making Information-gathering Information analysis Use of technology			

Note. Adjusted for native English speaking as well as the entire sample.

^a Strong improvement is classified as significant or near significant improvement on two thirds of the cohorts assessed.

^b Some improvement is classified as significant or near significant improvement on one or more up to one third of the cohorts assessed.

TABLE 11
Summary of the Results From Direct Behavioral Measures for Full-Time MBAs

Evidence of Value Added	Self-Management	Relationship Management	Cognitive
Strong improvement ^a	Efficiency orientation Planning Flexibility Self-confidence Self-control	Empathy Networking Oral communications Group management	Pattern recognition
Some improvement ^b	Initiative Attention to detail	Social objectivity Negotiating Developing others Persuasiveness	Systems-thinking
No improvement Decrease			

Note. Results from coding of behavior shown in audiotapes of the CII, videotapes of the GDE and Presentation Exercise, adjusted for native English speaking sample as well as the full sample.

^a Strong improvement is significant or near significant results on two thirds or more of the cohorts with one measure or one third to one half of the cohorts on all measures.

^b Some improvement is significant or near significant results on one cohort on one measure.

ment using self-directed learning theory as the basis for its design (Boyatzis, 1994, 1995; Goleman, Boyatzis, & McKee, 2002); (3) a focus on specific competencies in selected courses while addressing course material, such as the marketing course that assessed students on the presentation skills or the operations management course using group projects assessing their group process competencies; (4) a dramatic increase in the percentage of courses requiring field projects in companies, group work, and student collaboration; and (5) opportunities to participate in voluntary activities, such as a chapter for Habitat for Humanity and functional clubs, like the marketing club (which the part-time students did not have the time or

inclination to participate in). Our interpretation has been that the leadership course and the wide range of learning activities integrated into the MBA program caused the results.

What if Learning Were the Purpose of Education?

Borrowing from the title of chapter 10 of Boyatzis, Cowen, and Kolb's (1995) book for the subtitle here, we can offer a promising answer. An MBA education can help people develop cognitive and emotional intelligence competencies needed to be outstanding managers and leaders. But we cannot use the typical lecture-and-discussion methods with their focus on knowledge acquisition only.

TABLE 12
Summary of the Results From Direct Behavioral Measures for Part-Time MBAs

Evidence of Value Added	Self-Management	Relationship Management	Cognitive
Strong improvement ^a	Efficiency orientation Self-confidence Flexibility		
Some improvement ^b	Initiative Attention to detail	Group management Social objectivity Networking Negotiating Developing others Persuasiveness ^c Empathy ^c	Systems-thinking Pattern recognition
No improvement	Planning Self-control		

Note. Results from coding of behavior shown in audiotapes of the CII, adjusted for native English speaking sample as well as the full sample.

^a Strong improvement is significant or near significant results on all (i.e., both) cohorts.

^b Some improvement is significant or near significant results on 50% (i.e., one) cohort.

^c Empathy and Persuasiveness showed no improvement from entry to graduation on the 2 cohorts, but when Wheeler (1999) assessed 30 of the 54 people from these cohorts again about 2 years after graduation, they showed significant improved Empathy and Persuasiveness in the CII, which this smaller sample as well as the complete cohort sample had not shown from entry to graduation.

Rather, a more holistic approach can help dramatically improve our impact and the relevance of an MBA to students' future work organizations. Even here there is some doubt as to the knowledge retention of MBAs. In one study, professors readministered the final exam from the required course in accounting weeks after the same students took the exam (Specht & Sandlin, 1991). They reported the half-life of knowledge was 6 weeks.

One implication of these results should be to encourage schools to conduct outcome assessment studies to determine what their students are learning. Schools can create baseline studies, then experiment and innovate in their programs and assess the impact. Another implication is to be wary of the threatened distraction from our mission of preparing people to manage and lead by overemphasis or reliance on measures of selected competencies for screening applicants and judging how well a school is doing in measures such as rankings. For example, the GMAT is a measure of several of the cognitive abilities that predicts grades in the first year of an MBA program and yet has become a singular measure of a school's worth and a screening device for MBA students. Although the GMAT assesses some important characteristics, we should be using more comprehensive measures with true multitrait designs. Further, placement statistics, although considered an ultimate measure of effectiveness of an MBA program, are also narrow. Such statistics are a reading of market satisfaction, but are a relatively short-term one. Schools do not report, and often do not even follow placement records of students beyond the 6 months to a year after graduation. The aphorism that "we become what we measure" haunts higher education. Convenience of administration of certain types of tests and educational philosophies from earlier eras have often resulted in many of us not knowing what our students are learning. As we discover what distinguishes great managers and leaders, we should use these insights to guide our curriculum and pedagogy.

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