

Evaluating the Impact of the Management Academy for Public Health: Developing Entrepreneurial Managers and Organizations

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The Management Academy for Public Health is a management development program with the goals of helping public health managers learn to manage people, data, and finance, to think and plan like entrepreneurs, and to strengthen public health organizations. Managers enroll as teams and develop business plans in the Academy's extensive project-based learning component. Extensive internal and external evaluation shows that the program improves managers' knowledge, skills, and confidence in key curriculum areas; that participants apply many of the skills in their jobs; that many of the business plans receive funding, resulting in new public health programs; that the training experience helped agencies respond and plan after September 11, 2001; and that many participants report beginning to think more like entrepreneurs through activities like teaming, partnering, innovating, negotiating, finding funds, and generating revenue. The program demonstrates that robust training including extensive work-based project work with coaching can help public health managers gain many skills needed for the drive to "reinvent" government.

KEY WORDS: action learning, evaluation, government employees, management development, managers, New Public Management, public administration, public health, reinventing government, training

The Management Academy for Public Health is a 9-month management development program for public health professionals. Offered since 1999 by the School of Public Health and the Kenan-Flagler Business School of the University of North Carolina at Chapel Hill, it has been described elsewhere.¹⁻³ Its main goals are to help

managers learn to manage people, data, and finance, to think and plan like entrepreneurs, and to strengthen public health organizations. Managers enroll as teams and develop business plans in the Academy's extensive project-based learning component.

Earlier in this issue, we described the Academy and shared lessons learned in the process evaluation about developing public managers.³ This article summarizes results from the program's impact evaluations.

● Literature Review

The Academy, with its emphasis on entrepreneurial management in the public sector,³ is rooted in the worldwide movement often referred to as the "New Public Management."^{4,5} Known in the United States as "reinventing government," the movement has several hallmarks rooted in business practices: customer service, decentralization, privatization, collaboration, innovation, an entrepreneurial organizational culture, and accountability for results or "performance."^{5,6} Since the early 1990s, this movement has demanded that public managers devolve authority, plan businesses, generate revenue, measure performance, innovate, partner,

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negotiate, contract, and meet customer demands—all hallmarks of “entrepreneurial” behavior.⁴⁻¹¹

During the same period, management development programs have gradually moved away from exclusive reliance on didactic classroom training and toward using combinations of action learning, mentoring, coaching, multirater feedback, as well as more traditional seminars.^{12,13} Current programs also more commonly align themselves with a company’s strategic goals, and are evaluated in relation to these goals.¹³

Few published reports describe and evaluate management development programs that teach skills needed for the New Public Management, that use current management development methods, or that evaluate organizational level results. One meta-analysis of the outcomes of management and leadership development programs found only 12 studies from 1982 to 2001 for government employees (not counting educational and military settings).¹⁴ These programs were aimed at general management skills and were not particularly intended to produce the kinds of skills cited above as needed for the New Public Management. Across public and private sectors, the meta-analysis found that “the effect size is higher for knowledge outcomes and gradually dropped for [behavior] and system [organizational changes] across different [research] designs.” Less than 10 percent of the studies reported any results at the organizational level of analysis, with most studies examining only individual-level knowledge or behavior change. The 12 studies in the public sector showed positive contributions to knowledge, behavior, and in a few cases, to organizational improvements. The meta-analysis review did not use “learning methods” as an outcome predictor variable across the previously reported studies, likely because the studies tended to use didactic methods and “few empirical studies were available for outcomes of on-the-job assignments, coaching, mentoring, or feedback interventions... [methods which are] at the cutting edge of managerial leadership development programs for the future.”^{14(p240)}

An earlier review by Burke and Day¹⁵ had also found evidence that “different methods of managerial training are on the average moderately effective in improving [knowledge] and job performance” (p. 243) but up to that time, too, most training programs used classroom instruction and role plays, without work-based learning or feedback components.

The literature describes a few programs comparable to the Management Academy in curriculum and/or structure. One early example by Newell et al¹⁶ described a year-long program for federal managers that combined five skill-building workshops with required follow-up application activities, supported by peer trainees, a coach, and supervisors. After the

five workshop-and-application periods on general and change management, negotiation, productivity, and technology, the managers were placed into action learning teams across several units of the agency to address an agency problem. While evaluation was not extensive, many managers applied new skills to their work and taught them to peers, while the action learning projects helped address many agency problems and strengthened managers’ network ties with other managers across the agency. This program was notable for teaching several skills that are related to the New Public Management (eg, negotiation, performance, change) and for its use of multiple applied learning methods.¹³ Also using multiple learning methods, Tyson and Ward¹⁷ reported on a program that used multirater feedback, coaching, workshops, an e-learning Web site, and other meetings to improve general leadership style, relationships, and management methods used by public sector employees in the United Kingdom; repeated multirater feedback evaluation showed significant ratings improvements for senior managers but not for middle managers, and showed the need to use multiple measures of behavior to evaluate training.

Other programs showing the effectiveness of combined strategies include Olivero et al,¹⁸ who showed that a workshop followed by executive coaching significantly improved employee productivity, and Holinsworth,¹⁹ who described a succession management program that involved self-directed learning, leadership development programs, and supervisor support.

As for programs with more limited methods for the public sector, Yiu and Saner,²⁰ Lanahan and Maldonado,²¹ and Burgess²² all describe successful action learning-based management development programs in China, the United States, and the United Kingdom, respectively, but provide minimal evaluation evidence. The programs were designed to solve organizational problems and improve managerial effectiveness. Burgess²² describes how social work managers used action learning to solve problems in managing staff and projects.

Only a few of the published studies about public sector management development were specific to public health,^{1,23-25} and two of those were previous studies of the Academy.^{1,24} A recent study in Vietnam’s National Tuberculosis Program showed that a lengthy team-based Total Quality Management training program with project-based learning and coaching improved knowledge, skill, teamwork, and short-term TB indicators within provincial TB centers.²⁵

In summary, the few published studies about public sector management development are generally about programs that address few of the complex skills needed

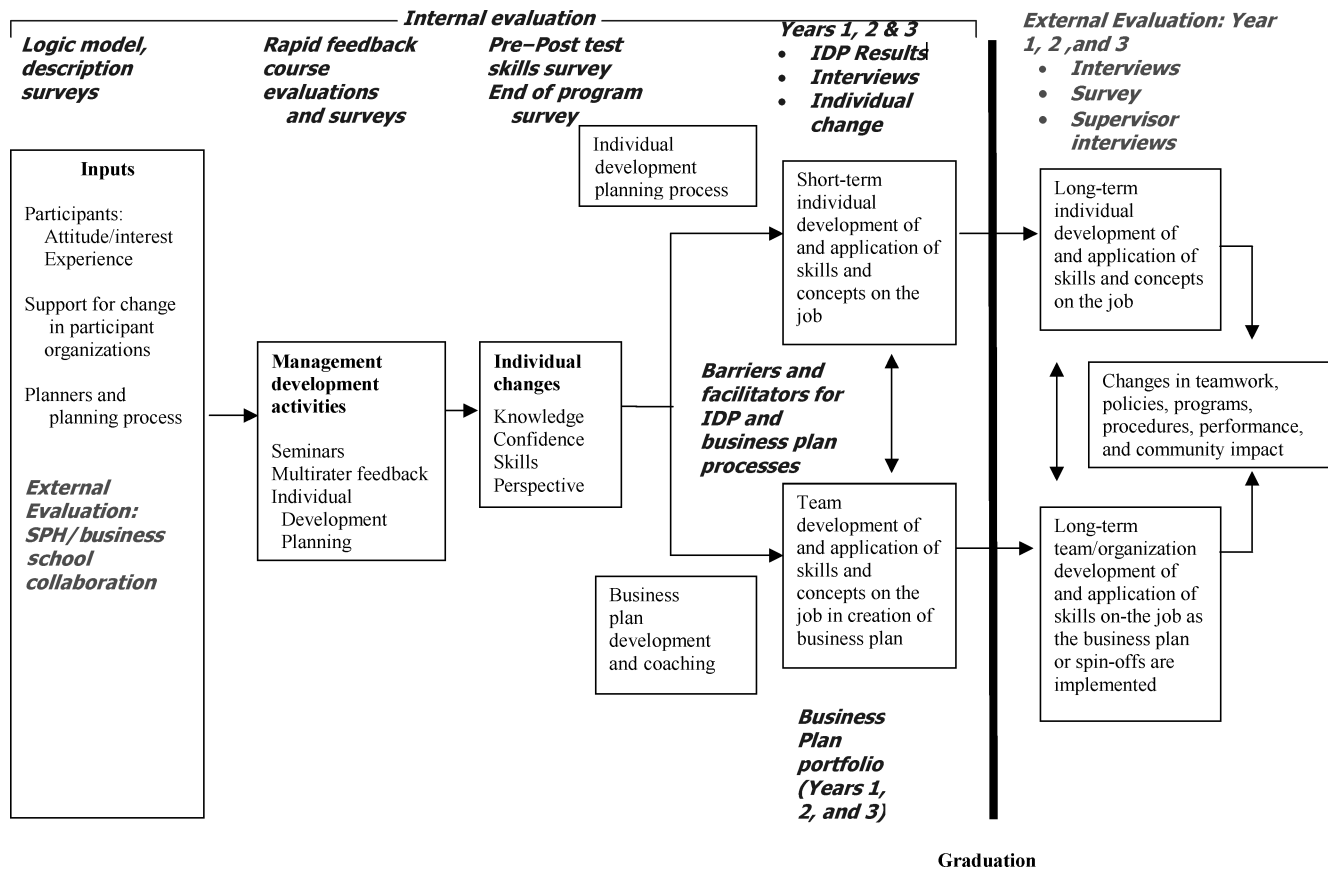


FIGURE 1. Management Academy for Public Health program and evaluation logic model.

today. More public sector and public health management development studies are needed that examine the effects of currently recommended learning methods on the skills and practices of managers, in particular on practices needed to “reinvent government,” and on organizations that invest in the programs.

● **Logic Model and Program Theory of Action**

The logic model (Fig 1) shows the seminars and other development activities intended to build basic knowledge and perspectives, confidence, and skill levels. The Academy teaches seminars directly related to the entrepreneurial emphasis in the movement to reinvent government: business planning and business plan implementation, civic entrepreneurship, negotiation and partnering, social marketing, team building, managing people, human resources, and financial management. Many of these courses are taught specifically with reference to preparing participants for success in their business planning project.

In both the Individual Development Plan and the business plan, the Academy asks trainees to perform

skills on the job and to present their progress, a process known as “work-based learning.”¹²

The Individual Development Plan, which participants develop after receiving multirater feedback and work on throughout the program, helps managers learn the value of goal setting and self-directed learning, and make specific improvements in their practices. The business planning project, completed by teams, provides practice in specific skills such as financial planning and budgeting, managing people, team building, business writing and presentations, negotiation, partnering, strategic thinking, and planning. It also provides an opportunity to practice these skills in an integrated manner, as they actually occur in managerial activity, and to practice them in an entrepreneurial context, because the assignment and coaching stretch teams toward finding innovative ways to partner, generate revenue, and sustain programs. These skills are developed for the short term, with the help of team coaches, and for the longer term, as teams implement their business plans and develop other “spin-off” projects. Improved practices at the individual and team levels are expected to lead to long-term improvements in teamwork, organizational policies, procedures, and

programs, and community impact, as the logic model shows.

● Evaluation Questions and Methods

The internal evaluation (Fig 1) asked the following questions about impact:

1. Did the Academy improve participants' management-related knowledge, beliefs, skills, confidence, and practices?
2. Did organizations support managers in applying skills on their jobs?
3. Did the Academy build public health emergency preparedness?

The external impact evaluation was conducted by the Lewin Group (Falls Church, Virginia), and asked these questions about impact:

1. To what extent did participants apply what they learned at the Academy to their job?
2. To what extent have participants translated their training into revenue enhancements for their organizations?

To answer these questions, the evaluators used surveys, observations, interviews, business plan analyses, and site visits.

Evaluation design, methods, and analysis

Knowledge, agreement, and confidence

In Academy Years 3 through 4, the Academy conducted a pre- to posttest to examine individual change in knowledge from the courses, using 2–5 multiple-choice questions for each course. (Year 2 data are not included because they were a pilot study and the questions were substantially revised for Year 3 and 4 tests.) For example, some questions asked learners to compute a simple budget calculation. The test also measured changes in agreement with perspectives: for example, in social marketing, the professors wanted participants to agree that “Word of mouth is an effective way to promote public health programs” and “Public agencies should conduct market research on a regular basis.” Participants were asked to rate whether they “strongly agree,” “agree,” “disagree,” or “strongly disagree” with each statement before and after the course, on a 4-point scale. For most courses, one or two agreement items were asked.

For each course, we also asked participants to use a scale to rate their level of confidence that they could perform two skills, with 1 being “not at all confident” and 5 being “completely confident.” The confidence ratings used a retrospective pretest, posttest design,

meaning that at the end of the program, participants rated their confidence that they could have performed the skills when they started the program—the “retrospective pretest”—and rated their confidence that they could perform the skills “now” having completed the program.^{26,27} After obtaining rather consistent results in Years 2–4, the Academy discontinued these tests.

Perceived skill levels

The Academy identified 22 central skills taught in the curriculum. At the end of Years 2 through 4, we asked participants to rate their level of skill when they started the program (a “retrospective pretest”), and at the end of the program (the “posttest”) using a 5-point scale (1= very weak skills, 5= very strong skills). We supplemented this measure of skill development with a questionnaire at the end of on-site training, by reviewing completed Individual Development Plans (IDPs), by collecting “artifacts” that document skills developed using the IDP, by reviewing business plans, and by conducting interviews and focus groups.

The external evaluation’s survey asked to what extent the participant was able to apply on the job the same 22 skills assessed by the internal evaluation from “Not at all” or “A little” to “To some extent” and “To a great extent.” For skills that participants had trouble applying, the survey asked about barriers. Interviews with participants and supervisors collected examples of how participants applied skills. Participant and supervisor interviews assessed the status of business plan implementation.

Organizational results

To assess organizational results, the external evaluation used surveys, interviews, and site visits for graduates from the program’s first 3 years. The survey asked questions about changes in the participants’ work responsibilities. In telephone interviews, the evaluators collected examples of organizational results as well as barriers and aids to making changes. Site visits provided greater understanding and confirmed results. To assess whether the program enhanced local health department revenues, the evaluator interviewed participants and supervisors and made site visits. Enhanced revenue was divided into “actual revenue” already obtained, and “forecasted revenue,” which was calculated by multiplying the respondent’s estimate of the “funding probability” by the amount of revenue expected. Forecasted revenue was included only if the funding probability was greater than 50 percent.

Data analysis

Inferential statistics for dependent *t* tests²⁸ about knowledge, agreement, skills, and confidence changes from

TABLE 1 ● Significance of test results for Management Academy for Public Health courses, Years 3 and 4 combined

Course	Construct	N	Pretest			Pretest			t test statistic	P
			Cronbach α	Mean score [†]	SD	Cronbach α	Mean score [†]	SD		
Managing people	Knowledge	275	.32	0.37	0.30	.40	0.50	0.31	6.99	<.0001
	Agreement	265	.45	0.85	0.11	.37	0.89	0.08	5.99	<.0001
	Confidence	273	.68	0.66	0.15	.64	0.82	0.10	19.56	<.0001
Marketing	Knowledge	275	.15	0.46	0.30	.30	0.71	0.28	11.79	<.0001
	Agreement	263	.19	0.73	0.14	.29	0.85	0.13	12.56	<.0001
	Confidence	271	.90	0.39	0.18	.84	0.66	0.16	29.83	<.0001
Finance	Knowledge	275	.23	0.22	0.22	.33	0.50	0.25	11.64	<.0001
	Agreement	263	.52	0.80	0.14	.31	0.82	0.13	2.66	.0084
	Confidence	272	.91	0.37	0.18	.88	0.61	0.17	28.96	<.0001
Civic	Knowledge	275	.27	0.28	0.28	.33	0.80	0.26	13.01	<.0001
	Agreement	264	.59	0.84	0.14	.70	0.92	0.11	9.87	<.0001
	Confidence	272	.72	0.40	0.18	.68	0.68	0.15	30.08	<.0001
Business plan	Knowledge*	271	...	0.38	0.49	...	0.51	0.50	4.91	<.0001
	Confidence	272	.75	0.37	0.17	.68	0.63	0.16	29.57	<.0001
Informatics	Knowledge	223	.08	0.78	0.29	.08	0.83	0.27	2.24	.0259
	Agreement*	218	...	0.64	0.21	...	0.73	0.23	4.95	<.0001
	Confidence	224	.80	0.46	0.18	.72	0.71	0.15	27.26	<.0001
Human resources	Knowledge	224	.42	0.40	0.29	.59	0.73	0.31	13.13	<.0001
	Agreement	223	.72	0.74	0.16	.77	0.77	0.17	2.91	.0039
	Confidence	224	.83	0.57	0.16	.77	0.77	0.13	19.98	<.0001
Quality management	Knowledge	119	.30	0.63	0.30	.63	0.82	0.29	5.50	<.0001
	Agreement	116	.62	0.88	0.16	.65	0.92	0.15	1.63	.1063
	Confidence	114	.92	0.43	0.19	.80	0.72	0.14	19.58	<.0001
Communication	Agreement	224	.33	0.77	0.15	.26	0.86	0.14	7.54	<.0001
	Confidence	223	.57	0.60	0.17	.45	0.82	0.12	24.62	<.0001

*There was only 1 question on this test for this construct.

[†]These scores represent the mean score for each construct divided by the maximum score for each construct. For example, if a course had 5 agreement items, and each item was scored 1 (*strongly disagree*) to 5 (*strongly agree*), the maximum score for a participant on agreement for that course was 25. If the participant had an agreement score of 17 for that course, this column has $17/25 = 0.68$.

the pre- to posttesting were computed in SAS (SAS Institute, Cary, North Carolina). Thematic analysis was used for qualitative data gathered from interviews and focus groups to identify common themes.²⁹

● Results

Testing and qualitative data show increases in knowledge, agreement, and confidence

All tests of knowledge, agreement, and confidence across Years 3 and 4 combined were significant except the agreement score for quality management course (Table 1). Internal consistency (the Cronbach alpha) scores for most tests of knowledge and agreement were low for most courses, meaning that these tests must be interpreted with caution. Since we asked only a few questions per course, this is not an exhaustive summary of the cognitive gains participants made from the program. For example, completed Individual Develop-

ment Plans and business plans showed that many learners gained knowledge and skill in finance.

Participants report skill development in survey and interview results

The internal evaluation gathered data showing skill development. Participants reported highly significant gains in skills ($P < .001$) on all 22 key skills surveyed in each year that the test was performed (Years 2–6) (Table 2). Business planning, negotiating, developing marketing plans, empowering and delegating staff, measuring outcomes, and preparing budgets were some of the skills with the most highly significant changes in perceived skill levels; all of these skills are prominent in the literature on public sector entrepreneurship.^{6,11}

On-the-job skill application seems to have been most extensive in managing people, followed by managing data and money, as described below.

TABLE 2 • Self-assessed skill levels: Retrospective pretest, posttest, and difference scores for Years 2-6 combined

Skill	N	Retrospective pretest		Posttest		Difference score		t test statistic	P
		Mean*	SD	Mean*	SD	Mean	SD		
Write a business plan	429	0.3725	0.1780	0.7921	0.1360	0.4196	0.1957	44.4	<.0001
Negotiate relationships and deals	430	0.5335	0.1597	0.7981	0.1315	0.2647	0.1551	35.38	<.0001
Develop a marketing plan	429	0.4657	0.1698	0.7433	0.1350	0.2779	0.1641	35.08	<.0001
Empower people and delegate tasks	428	0.5738	0.1644	0.8116	0.1197	0.2379	0.1589	30.96	<.0001
Measure outcomes	430	0.5958	0.1441	0.7884	0.1164	0.1930	0.1319	30.35	<.0001
Budget preparation and tracking skills	428	0.5028	0.2064	0.7360	0.1484	0.2343	0.1619	29.87	<.0001
Market segmentation skills	428	0.4710	0.1585	0.6909	0.1422	0.2201	0.1526	29.83	<.0001
Define data needed for decision making	430	0.6014	0.1653	0.8079	0.1288	0.2065	0.1437	29.8	<.0001
Use data effectively	430	0.6293	0.1683	0.8153	0.1206	0.1860	0.1392	27.71	<.0001
Form public-private partnerships	426	0.5446	0.1939	0.7845	0.1540	0.2399	0.1794	27.6	<.0001
Formal presentation skills	430	0.6032	0.1804	0.8074	0.1313	0.2047	0.1544	27.48	<.0001
Motivating staff	429	0.6359	0.1431	0.8042	0.1138	0.1678	0.1268	27.43	<.0001
Work effectively with key stakeholders	429	0.6056	0.1755	0.8023	0.1320	0.1967	0.1488	27.39	<.0001
Stakeholder analysis-political skills	429	0.5305	0.1857	0.7349	0.1558	0.2047	0.1558	27.21	<.0001
Teamwork skills	430	0.6740	0.1605	0.8738	0.1183	0.2000	0.1569	26.43	<.0001
See trends in data, model outcomes	429	0.5991	0.1629	0.7726	0.1290	0.1748	0.1444	25.07	<.0001
Performance appraisal	426	0.6216	0.1609	0.7996	0.1267	0.1779	0.1521	24.41	<.0001
Analyze numbers and explain them	427	0.5667	0.2103	0.7548	0.1615	0.1883	0.1614	24.1	<.0001
Quality assurance skills	427	0.6122	0.1611	0.7813	0.1292	0.1700	0.1458	24.1	<.0001
Interview job candidates	430	0.6419	0.1709	0.8219	0.1350	0.1800	0.1589	23.49	<.0001
Written communication	430	0.6772	0.1644	0.8324	0.1267	0.1558	0.1386	23.31	<.0001
Understand new cultures	429	0.6629	0.1653	0.7953	0.1308	0.1324	0.1414	19.39	<.0001

*These columns represent the mean score for this skill (1 = very weak skills, 2 = weak skills, 3 = fair skills, 4 = strong skills, 5 = very strong skills) divided by 5.

Managing people

Across the seven “managing people” skills analyzed in the external evaluation, “communicating with others” rated the highest on application-to-the-job. A large majority of respondents indicated that they were able to apply that skill either “to some extent” (64%) or “to a great extent” (29%). Among the remaining skills, the percentages of respondents indicating that they were able to apply the skill “to some extent” or “to a great extent” combined were as follows: improving quality (82%); managing self (80%); managing others (80%); managing projects (81%); negotiating (73%); and interviewing, hiring, and performance evaluation (70%). Many participants reported these skills to be the most useful, perhaps because of daily opportunity to use them. These reports were backed by supervisor interviews and on-site observations. Supervisors most cited improved leadership and management skills.

Managing data

Across the six data skills assessed in the external evaluation, “using data for decision-making” was rated the highest for applicability, with 36 percent of respondents indicating that they were able to apply this skill

“to a great extent” and 51 percent “to some extent.” Among the remaining skills, the percentage of respondents indicating that they were able to apply the skill “to a great extent” or “to some extent” combined were as follows: displaying data effectively (85%), analyzing/interpreting data (84%), defining data for decision making (81%), designing/developing data bases (37%), and managing an IT project (28%). Many participants cited increased comfort with data as one of the most valuable data-related outcomes. Applications cited included increased use of PowerPoint for presentations, department-wide changes in data systems or communication, and developing a new data management tool for local environmental health programs.

Managing money

Across the six financial skills assessed, “interacting with financial staff” was the highest rated for applicability, with 21 percent of respondents indicating that they were able to apply this skill to a great extent and 42 percent “to some extent.” Among the remaining skills, the percentage of respondents indicating that they were able to apply the skill “to a great extent” or “to some extent” combined were managing/tracking

budgets (58%), developing budgets (58%), conducting a cost study (40%), preparing financial statements (31%), and conducting a break-even analysis (30%). Others reported that their new financial skills had given them a new perspective on their job, a better understanding of budgetary reports, and improved ability to talk knowledgably with financial staff. Compared to the other two main skill types, participants seemed to have more difficulty in translating skills related to managing money to their jobs, partly because as in many organizations, financial matters were routinely handled by special financial managers.

Supervisors were split in their opinions regarding the financial training their staff received at the Academy. About half thought that the new skills were invaluable, and they were now able to share more financial responsibilities with their staff. Others thought that financial skills had little relevance for trainees' jobs.

Team skills

Skill application was also found at the team level. Through the business plan, teammates helped each other learn skills. Teams used "managing people" skills to improve communication, presentations, decision making, and staff management. According to many supervisors, the Academy resulted in team building and more effective interaction and coordination across departments. Across all 6 years, 82 percent agreed that "As a result of MAPH, teamwork has improved in our unit," and again after Years 5 and 6, 92 percent agreed that "As a result of MAPH, I will be a more effective team player." Teams were also able to apply skills related to managing data and managing money. For example, financial training enabled all team members to speak the same language when discussing budgets.

Entrepreneurial skills and perspective

Surveys and interview data also contained many self-reported knowledge, skill, and confidence gains and behavioral changes. Participants stated, for example, that "This has helped me understand the role of a leader, how to motivate team participants and work effectively in my clinic," and "By gaining better understanding of how to gather data, statistics and information, I am better prepared when speaking to boards... We had lost a grant for \$85,000. I went back and prepared an outcomes report anyway, and the hospital called and gave us the grant back." Another stated, "Prior to this course, I had a vague understanding of budgets, but now I can distinguish operations budgets, revenue expenses and detail costs to better help with managing a public health program from a business perspective."

Many reported broad changes, such as in partnering, planning, teamwork, and working with an en-

trepreneurial perspective. When the Academy began to ask the question, after Years 5 and 6, 83 percent strongly agreed or agreed that "As a result of MAPH, I find myself thinking more like an entrepreneur, looking for creative ways to raise revenue for programs." One stated, "I am no longer apprehensive about the outcome of [partnerships with other agencies]—about sharing control, sharing resources, etc. I am presently negotiating with a community based organization to conduct testing for them. We will be able to collect \$20,000–\$30,000 over two years." Another explained, "This gave us an opportunity to really figure out... that we could make time if we had to, to solve a problem, develop a new plan, maybe go after money." Another noted, "The most important concept that we learned from this activity is the concept of teamwork.... My team and I were able to use the strength in the group process to accomplish something that hadn't been able to have been achieved by one individual [working alone]. That's a very big confidence booster."

Thus, much survey and interview evidence indicates that learners gained knowledge, skill, and confidence, and that many changed their managerial behaviors.

Completed individual development plans demonstrate skill and behavior changes

Many participants reported skill improvements and practice changes on their IDPs and in individual and group interview sessions. As the Academy had requested, many managers produced "artifacts" to document their learning efforts and behavior changes, such as certificates from training courses at local community colleges, letters from funding agencies describing grant awards, e-mail feedback from colleagues on gains in their presentation skills, or copies of new budgets developed. In Year 1, 93 percent of learners worked on the first goal in their plan, and 84 percent obtained results; 81 percent worked on their second goal, and 69 percent obtained results, and somewhat fewer worked on their third and fourth goals and obtained results.¹ From conversations with graduating participants, and from informal reviews of the IDPs and artifacts that participants submitted at the end of the program, the evaluators know that many learners put significant energy into this learning method, but the Academy has not formally analyzed these learning projects after Year 1, because of funding limitations.

Completed and implemented business plans demonstrate skill and behavior changes

The case studies in this issue provide detailed examples of much-needed programs that Academy teams planned, obtained funding for, implemented,

and have sustained over several years. The completed business plans that teams submitted at Academy graduation also form a kind of “portfolio” demonstrating many skills.^{30,31} The Business Plan Resources/Models link at the Academy Web site, <http://www.maph.unc.edu:9003/reports/#plans>, has many examples of well-written plans demonstrating skills in market assessment, finance, planning, and other skills. Plans have enabled teams to develop programs in such diverse arenas as car seats for children, improving diabetes education and screening, improving dental care for the underserved, and establishing home visitation programs for families after preterm births. The external evaluation report on the Academy Web site gives many other examples.

Approximately 54 percent of respondents to the external evaluation’s participant survey were engaged with their business plans at some level; 22 percent indicated that their business plan had been fully implemented, 17 percent indicated that they were midway in the plan, and 15 percent were in the initial stages. Forty-six percent of respondents had postponed or abandoned their plans.

Did organizations support managers in applying skills?

Across Years 2–6, 86 percent of graduates strongly agreed or agreed that both their supervisors and peers had supported them in applying Academy skills on the job, while 66 percent agreed that “My organization has enough money and staff to support me in applying the MAPH skills to my job” (Table 3). Yet for all courses taught, the majority reported that they “intend to apply” the content in their jobs, indicating an intention to adapt concepts to their settings.

When supervisors were asked to describe the greatest benefits of the Academy for their institutions, they most frequently cited (1) successful implementation of business plans, (2) broad dissemination of management skills across the organization, (3) effective leveraging

of available resources, and (4) partnering with external organizations to pursue funding. Many supervisors reported supporting the Academy and encouraging staff to apply.

The external evaluation found that the major challenges to skills application included a nonsupportive organizational culture, lack of time, and lack of applicability to job responsibilities. The biggest barrier to those who did not apply financial or data skills “at all” or who applied them only “a little” was nonapplicability to their current position.

Did MAPH Build Public Health Emergency Preparedness?

After September 11, 2001, the Management Academy surveyed managers to determine whether and how the training helped managers respond to these emergencies. Managers credited the Academy with improving their performance in several skill areas related to disaster management. These results are detailed elsewhere.²⁴

Did Management Academy Help Agencies Obtain Funding?

In its first 3 years, the Academy expended approximately \$2 million on training. The teams trained during those 3 years—composed of about 500 managers from four states—generated over \$6 million in start-up funds, actual and forecasted revenue (Table 4).³² This dollar figure includes federal, state, and private grants and gifts toward start-up of a business plan, in addition to revenue generated through fees or billable services. Academy evaluators are currently preparing to collect this information from more recent cohorts.

Approximately 38 percent of teams expected to generate revenue from an Academy business plan or spin-off (Table 4). Governmental and nongovernmental grant funding together represented approximately

TABLE 3 ● Participants’ perceived support for applying management academy skills in their work—Years 2–6 combined (N = 535–536)

Item	Strongly disagree, %	Disagree, %	Neutral %	Agree, %	Strongly agree, %	Mean*	Standard deviation
My supervisor supported me in applying MAPH skills to my work.	1	2	10	34	52	4.34	0.86
My peers supported me in applying MAPH skills to my work.	<1	2	12	43	43	4.25	0.79
My organization has enough money and staff to support me in applying the MAPH skills to my job.	4	7	24	40	24	3.73	1.04

*1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

TABLE 4 ● Ability to generate MAPH-related enhanced revenue (n = 73 teams)*

Teams generating revenue	28 (38%)
Actual revenue	\$3,988,000
Forecasted revenue	\$2,057,000
Total enhanced revenue	\$6,045,000

*MAPH indicates Management Academy for Public Health.

85 percent of the total \$6 million generated through enhanced revenue initiatives, with fee-based initiatives accounting for the balance. As cited above, many graduates said in interviews that they had become more entrepreneurial in their approach to generating revenue for public health, including looking to nontraditional sources. Examples of these perspective changes and other quotations about skills gains are recorded in the Evaluation Updates on the Academy Web site at <http://www.maph.unc.edu:9003/reports/>.

● Discussion

The Academy produced significant improvements in knowledge, skill, confidence, managerial practices, and organizational results, and contributed to public health emergency preparedness. The program has contributed to organizations' human capital by strengthening managers' knowledge and skills, social capital by strengthening teams, and financial capital through business plan funding. Many organizations have developed new programs to meet community needs through the business plan projects or spin-offs they later developed using the same skills. Most agencies and supervisors supported managers in their learning and business plan development activities. The program contributed to the agencies' ability to respond and prepare plans after September 11, 2001, and the fact that many business plans have been implemented is an indication that participants have continued to use their management skills in implementing and sustaining new projects.

This study has several limitations. First, it provides only highlights of the internal and external impact evaluation results. Complete reports of both, plus business plans and other reports with extensive quotations from participants, are available on the Academy Web site (<http://www.maph.unc.edu/reports/>). Second, the study does not report in-depth results from the Individual Development Plans. Since managers, like organizations, enter the program at various stages of development, further studies should examine more about these individual benefits. The case studies in this issue provide additional evidence of personal and organizational benefits.

This evaluation has demonstrated that a robust, multistrategy management development program using extensive work-based learning components¹² can help public managers gain the complex capabilities they need in the era of "reinventing government." The participants gained discrete skills in managing people, data, and finance, and through team-based business planning with coaching combined those skills in an entrepreneurial and innovative fashion to build partnerships, generate revenue, and meet community needs. Using the team-based development approach enabled the Academy to build a group of supportive managers in each organization, to assign this demanding project work, and to thereby produce a concrete organizational benefit.³ The Academy has plans to follow up with additional teams to assess longer term changes in management practices and business plan implementation. The Academy hopes that this study and others to come inform the broader literature on producing managers for today's complex public sector organizations, and contribute to understanding and practice about methods for developing public managers' capabilities.

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