

TEACHING PUBLIC
ADMINISTRATORS
ABOUT COMPUTERS

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Abstract

Public administration curricula typically offer only very limited exposure to computers, despite the growing importance of computers in public management. This paper examines an approach to teaching computer management in a masters of public administration program, and relates that approach to the broader question of what public administrators need to know about computers. The approach involves instruction in computer literacy, computer applications, and management of computer resources. Instruction in these three areas appears to increase the importance students place on managing computer resources and on understanding computer concepts, and to decrease the relative importance students place on managers' knowledge about specific computer applications. This shift in viewpoint appears appropriate based on interviews which suggest that practicing administrators place greater emphasis on understanding the broad issues of computer resource management, rather than on more specific computer knowledge or skill.

TEACHING PUBLIC ADMINISTRATORS ABOUT COMPUTERS

With the widespread recognition of the growing importance of computers, those of us involved in professional education of public managers realize we need to incorporate more computer-related coursework into the curriculum. But what type of coursework is appropriate? What do public administrators need to know about computers? In the Public Administration Program at Portland State University we have made some initial attempts towards answering these questions.

Like many Master of Public Administration programs, the MPA curriculum at Portland State traditionally involved only very limited exposure to computers. Computer applications were limited to experience with statistical computing as part of the required course on data analysis. In light of the growing importance of computers for public managers, a course titled "Management Uses of the Computer in the Public Sector" was initiated in 1978, using as an instructor an adjunct professor who managed data processing for a large local public agency. Since then the course has become a regular course offering that is taught twice a year, and is now one of the more

popular courses among the students.

The approach the original course instructor used, and which subsequent instructors developed, focuses on three types of knowledge:

- 1) computer literacy
- 2) appreciation of computer applications
- 3) understanding how to manage computer resources

Computer literacy is taught through lectures, reading, and tests on basic computer concepts and acronyms during the first several weeks of the term. Appreciation of the range of computer applications is gained primarily through reading and guest lectures, and through an evening of intensive, introductory experience using word processing and electronic spreadsheet programs on personal computers made available for class use at a local high technology corporation. The major theme of the class, however, concerns the management of computer resources. For teaching computer management we have used Richard Nolan's Managing the Data Resource Function,^{1/} along with case studies of local agencies. As taught, the course strives to go beyond just learning the language of computerese or learning about the latest hardware and software. Rather, the course emphasized the management of computer resources to accomplish organizational goals.

Effect of Computer Management Course on Student Views of What Public Administrators Need to Know

Since taking this course is optional, most students who enroll already feel that knowledge about computers is important. We were interested to know, however, how the course affects students' views of the importance of different types of computer knowledge. In particular, we wanted to know how students felt about the relative importance for public administrators of the three categories of knowledge the course includes-- computer literacy, computer applications, and computer management. During the Fall, 1983, we had all twenty-four students enrolled in the course fill out a questionnaire rating the importance (using ten-point scales) of these different types of knowledge at the beginning of the course (pretest), and at the end of the course (posttest).

Figure 1 presents the pretest and posttest results. For both the pretest and the posttest, computer management has the highest rating, followed by computer literacy, and then computer applications. However, for the pretest the differences in ratings are minor, and not even statistically significant. The posttest results show an increase in the importance of computer management and literacy, but a decline in the importance of knowledge about applications. The posttest differences between management and literacy, on the one hand, and applications, on the other, are statistically significant ($t = 4.5, 3.4$, respectively) and fairly substantial. Thus, the course appears to increase students' views of the importance of computer literacy and knowledge about computer management, but decreases students' views of the importance of knowledge about applications.

Examining the variability of the importance ratings is also revealing. Table 1 presents the standard deviations of the pretest and posttest ratings. Pretest ratings of computer literacy show the most homogeneity, compared to pretest ratings of management and applications. Between the pretest and posttest the degree of consensus about the importance of applications became more diverse. In fact, by the end of the term the class was essentially bifurcated between those viewing knowledge about applications as unimportant (importance ratings of 1-5), versus those viewing such knowledge as important (importance ratings of 7-10). The difference between these two subgroups may result partly from differences in the use of computers at work: 8 out of 11 of those giving high ratings used computers at work, compared to 7 out of 13 giving low ratings.

Table 2 further examines the differences between students with computer experience, compared to those without experience. Although the small subsamples require that the results must be considered only suggestive, the results do indicate that students with computer experience may view computer knowledge as more important to managers. Such a difference could result from either 1) students learning through experience the importance of computer knowledge, or 2) students who consider computers important generating opportunities to use computers. Table 2 also suggests that the class may have the effect of decreasing differences between these two groups. As students gain knowledge and experience through the course, the initial differences between those with and without work experience with computers appears to diminish.

In sum, the class seems to have increased the importance of computer applications. Also, the degree of consensus about the importance of computer management increased as well. In contrast, at the end of the class there was great variability about how students viewed the importance of managers' knowing about computer applications. Overall, these findings perhaps suggest that management-oriented computer courses that encompass computer concepts, applications, and management may have these effects to MPA students' views of computers:

-- Many students will shift toward viewing

management issues and familiarity with basic concepts as the most critical issues for the administrator, rather than facility with applications. However, those who work with computers are less likely to down-grade the importance of familiarity with applications.

-- Students without computer experience will become more like those with experience, in terms of their views of what managers need to know.

These effects seem to indicate that a balanced exposure to computer concepts, applications, and management issues will deflate the mystique of the computer and all its latest applications as ends unto themselves, thereby facilitating the growth of a healthier management perspective. That perspective views computer resources as organizational resources, like other organizational resources, that effective administrators must know something about and must try to manage to accomplish organizational goals.

What Managers Say They Need to Know About Computers

As part of the Fall, 1983, "Management Uses of the Computer" course, some of the students participated in a project to interview practicing managers, primarily managers in public organizations. The purpose was to gather the thoughts of managers in different types of positions about what managers need to know about computers. Fourteen managers were interviewed, representing school districts, hospitals, regional federal offices, and other agencies, and ranging in their positions from assistant agency directors, finance directors, data processing directors, to lower-level administrators. Those interviewed were asked a series of open-ended questions about what they needed to know about computers, and what they thought students studying public administration should learn about computers.

Although the managers that were interviewed represent only a small, arbitrary sample of managers, the results do suggest how many practicing managers may think about computers. When asked what they needed to know about computers to do their jobs, the most common type of response (11 managers out of 14) was that they needed to know what computers can be used for, not how to actually use computers. Similarly, when asked what public administration students needed to learn about computers in their college courses, most managers (11 out of 14) indicated that students needed to learn about computers' capabilities, whereas only a minority (5 out of 14) mentioned the need to learn how to use computers. When asked more specifically what a "Management Use of Computer" course in a public administration curriculum should include, the most common response (10 out of 14) again was not instruction in how to use computers, but rather learning about the capabilities of computers and data processing departments. In short, in these interviews managers stressed the importance of general knowledge, understanding, and concepts more than

specific computer skills.

Although general understanding was stressed more than specific skills, the interviews did reveal considerable concern about the need for middle and upper level managers to start using computers themselves. For example, when asked what changes would occur in the future about what managers need to know, almost all managers interviewed (12 out of 14) indicated they thought managers would need to become more involved in actually using computers. Also, 9 out of 14 did indicate they currently made some use of computers, and 8 out of 14 indicated they thought a "Management Use of Computer" course should involve learning to do some applications.

Overall, these interviews reveal a recognition that effective organizational use of computer resources involves management issues as well as technical issues. Concern that managers learn some computer applications was stated usually within the context of what a manager needed to know, as distinct from what more technical staff needed to know. As a GS15 at a regional federal office commented:

All students ought to have some hands-on time. They need to deal with keyboard phobia. They don't need programming skills, although it's helpful to have enough experience to know what is involved.

In discussing the recommended content of a "Management Use of Computer" course, that same manager went on to emphasize the management issues underlying the use of computer resources:

Students need a basic knowledge of what that tool [computers] is capable of. They ought to relate that tool very closely to the organization and its objectives. The importance of establishing organizational processes to manage software and hardware is where we have failed to date.

Conclusion

Public administration coursework should expose students to several types of computer knowledge. First, some basic understanding of computer terms and concepts, often termed computer literacy, is essential. The questionnaire and interview data obtained from both students and managers indicated concern about the importance of basic computer literacy to practicing managers. Beyond computer literacy, some tension exists between the relative emphasis to give computer applications versus management of computer resources. The Portland State "Management Uses of the Computer" course, which involves exposure to both applications and to management issues, seems to cause students to downgrade somewhat the relative importance they place on ability to do applications. Also, the interviews with practicing managers emphasized more the importance of general management issues as opposed to experience with applications. Thus although public administration coursework needs to expose students to basic concepts and to computer applications, it must go further and deal

with the issues that arise in trying to manage computer resources to accomplish organizational goals.

The educational needs that coursework in public administration programs must address will undoubtedly continue to change. The importance of teaching basic computer concepts and terminology (computer literacy), for example, may eventually decline as computer use and knowledge become more commonplace, and hence basic understanding can be taken for granted. The importance to managers of personal involvement in applications, in addition to knowing about the range of potential applications, may increase as computers become more "user friendly" and more commonly used by middle and top managers. Certainly, as the range of computer use increases, so will the importance of managing data resources. As the novelty of the ubiquitous computer wears off, so will the novelty of managers' viewing the use of computer resources as a management issue rather than as a technical issue. The teaching of information management in public administration curricula may thus evolve away from remedial instruction in computer concepts towards a role comparable to teaching personnel management and financial management.

Notes

1/ Richard Nolan, Managing the Data Resource Function (St. Paul: West Publishing Co., 1982).

Acknowledgements

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Figure 1

MEAN STUDENT RATINGS OF IMPORTANCE OF DIFFERENT TYPES OF COMPUTER KNOWLEDGE, PRETEST AND POSTTEST

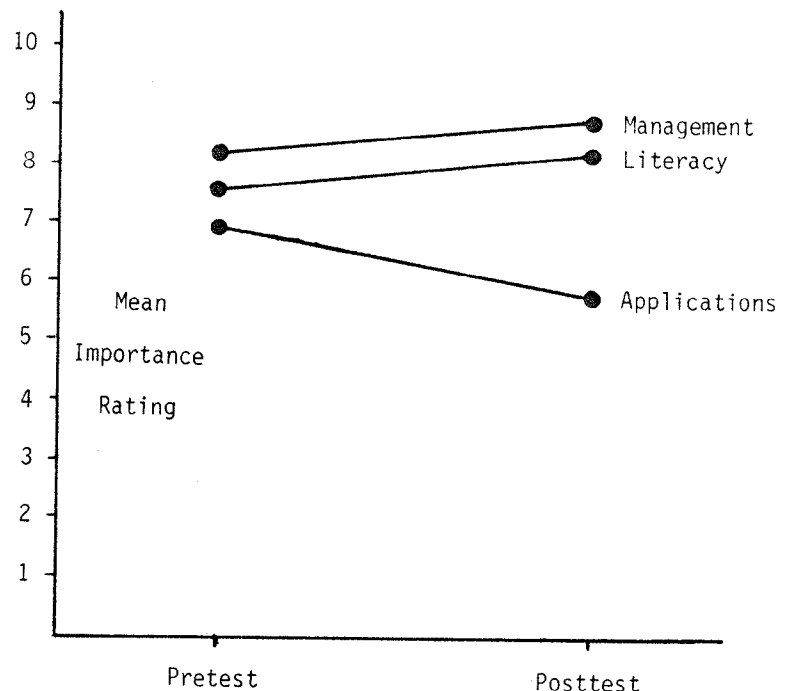


Table 1

STANDARD DEVIATIONS OF IMPORTANCE RATINGS

	<u>Pretest</u>	<u>Posttest</u>
Management	2.19	1.50
Literacy	1.59	1.75
Applications	2.17	2.79

Table 2

COMPARISON OF MEAN IMPORTANCE RATINGS, STUDENTS WITH AND WITHOUT COMPUTER EXPERIENCE

	<u>Experience</u>	<u>No Experience</u>	<u>Difference</u>
<u>Pretest</u>			
Management	9.1	7.6	1.5
Literacy	8.2	7.4	.8
Applications	7.7	6.1	1.6
<u>Posttest</u>			
Management	9.3	8.3	1.0
Literacy	8.3	8.1	.2
Applications	6.1	5.4	.7
<u>Pre-Post Change</u>			
Management	.2	.7	--
Literacy	.1	.7	--
Applications	-1.6	-.7	--
N	16	9	

Note: "Experience" and "No Experience" refers to whether the students indicated they had experience using computers at work.