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ABSTRACT

This study presents a statistical picture of the faculty who are delivering instruction in occupational or technical programs at postsecondary institutions. It examines the demographic and educational background characteristics of the faculty, job conditions, perceptions of institutional policies and mission priorities, and perceptions of student characteristics. It also develops and tests models of salaries, instructional methods, and organizational outcomes to demonstrate causal relationships that administrators and policymakers may find useful for implementing change. Data were obtained from a survey of postsecondary occupational education institutions conducted by the National Center for Research in Vocational Education. The study found that the factors that most influence instructional methods are institutional characteristics, class size and adequacy of materials/equipment, perceptions of institutional mission, and education and training of instructors. The institution's salary/personnel policies are not related to instructional methods. The factors that best explain organizational outcomes include perceptions of students, perceptions of the institution's salary policies, instructional methods, experience of the instructor, and job characteristics. Institutional characteristics, institutional mission perceptions, and educational backgrounds of the instructors do not seem to influence organizational outcomes. Salaries are determined by institutional factors, job characteristics, and personal characteristics. (KC)

DETERMINANTS OF INSTRUCTIONAL DELIVERY AND ORGANIZATIONAL OUTCOMES IN POSTSECONDARY OCCUPATIONAL EDUCATION

by

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DETERMINANTS OF INSTRUCTIONAL DELIVERY AND ORGANIZATIONAL OUTCOMES IN POSTSECONDARY OCCUPATIONAL EDUCATION

Postsecondary occupational education is undergoing considerable scrutiny. The fundamental issue is to what extent this segment of the educational system can salvage the productivity of a work force that has been poorly educated at the secondary level and recoup skills that have depreciated at a rapid pace due to accelerated technological change and international competition. Institutions that offer postsecondary occupational education span a wide spectrum along dimensions of size, policies, institutional characteristics, governance, and mission. A common element across this diversity, however, is the dynamics of the teaching and learning process. If the importance of the dynamics between instructor and student are ignored or underestimated in their importance, then no measure of institutional reform or change will achieve impact.

The purpose of this paper is to present a statistical picture of the faculty who are delivering instruction in occupational or technical programs at postsecondary institutions. It examines the demographic and educational background characteristics of the faculty, job conditions, perceptions of institutional policies and mission priorities, and perceptions of student characteristics. A further purpose of the paper is to develop and test models of salaries, instructional methods, and organizational outcomes. In order to improve programs, it is important to understand the factors that influence the teaching and learning process. The models that are presented in this paper begin to empirically demonstrate causal relationships that administrators and policy makers may find useful for implementing change.

A Model of Instructional Delivery

The model of instructional delivery that underlies the study is illustrated in figure 1. In that model, faculty[1] personal and educational characteristics and job conditions have direct influences on instructional delivery[2]. Less straightforward,

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[1]In this paper, the terms faculty and instructor are used interchangeably.

[2]Community and other external factors and institutional resources also have important effects on instructional delivery. However, for ease of exposition, we are focusing solely on instructors in this model. In other words, for a given set of external circumstances and institutional resources, it is faculty characteristics that influence instructional delivery.

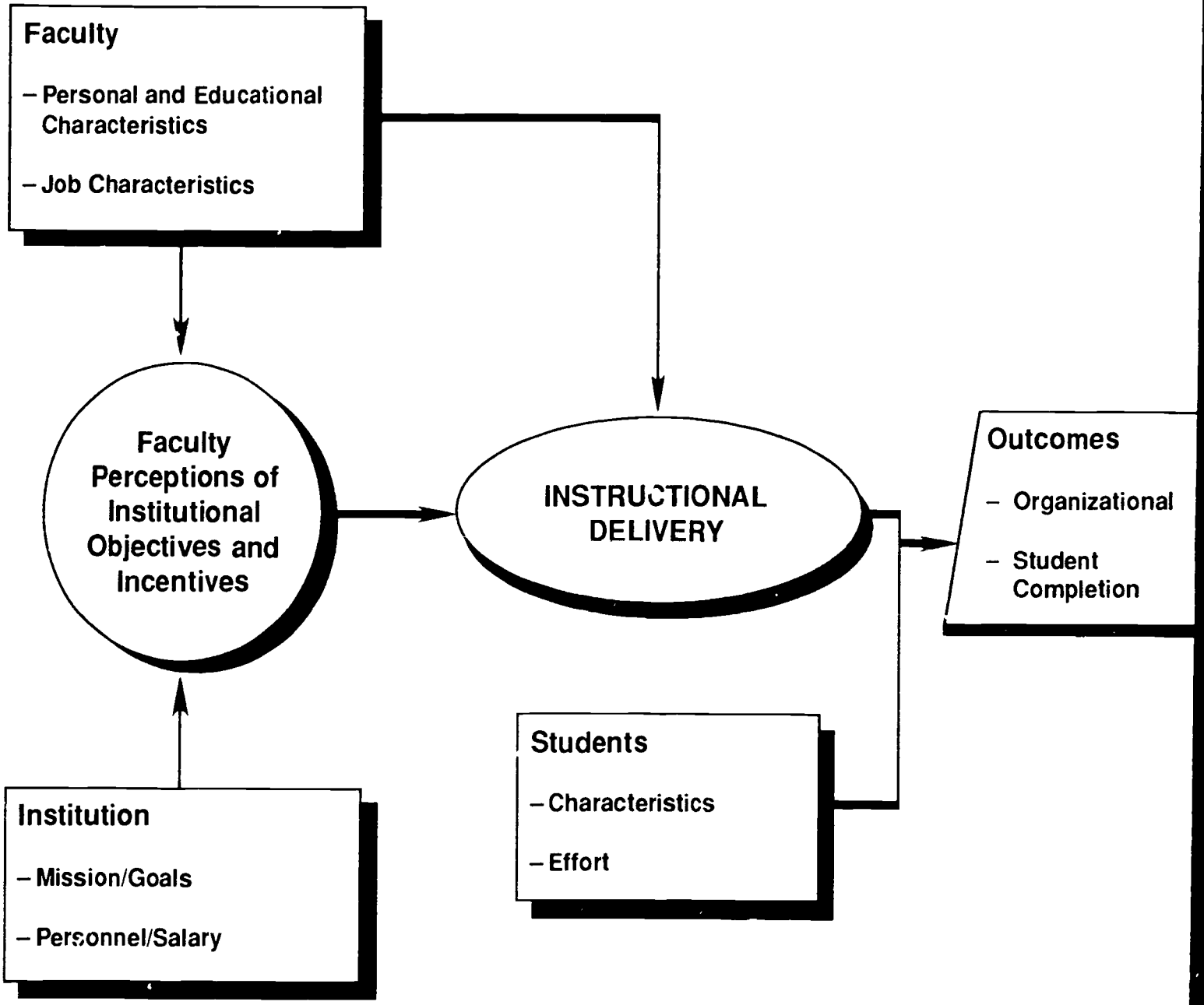

Figure 1. A model of instructional delivery

however, are the linkages between institutional goals and personnel/salary structures and instructional delivery. The model suggests that it is the instructors' perceptions of these goals and structures that influence instruction. Instructional delivery then interacts with student characteristics to result in organizational outcomes (campus atmosphere, for instance) and student outcomes.

The data analyses presented in this paper are designed to test this model. Specifically, the paper first describes statistically each of the major components of the model--faculty personal and educational characteristics, faculty job characteristics, institutional goals, institutional personnel/salary policies, instructional delivery, student characteristics, and organizational and student outcomes. The descriptive statistics only begin to suggest cause and effect relationships, however. The paper thus proceeds to a model of the determinants of salaries estimated in a multivariate regression framework. Then results from estimating the model shown in figure 1 are presented. Finally, general discussion of the findings is given.

General Description of Factors Influencing Instructional Delivery

Faculty personal and educational characteristics. Exhibit 1 provides a general statistical profile of the instructors that responded to the survey of postsecondary occupational education institutions conducted by the National Center for Research in Vocational Education (see Hollenbeck 1988 for a complete description of the survey and data elements.) Data are presented for the total sample and disaggregated by institution type. The disaggregation reaffirms the significant differences across the three types of institutions in mission, student background, operational policies, instruction, and other important characteristics (Hollenbeck et al., 1987).

The average age of the faculty, a characteristic that does not vary much by institutional type, is 45. Roughly one-third of the instructors are less than 40; one-third in their forties; and one-third greater than 50. Approximately one-third of the instructors are female. Community/junior college programs have the highest percentage of women instructors--36% and technical institutes have the lowest--27%. About 90% of the instructors are white, and again, there is little difference by institution type.

As might be expected, the educational attainment of the faculty differ considerably by type of institution. The median level of education of instructors in the occupational programs at community/junior colleges is a Master's degree; at technical institutes, it is a bachelor's; and at colleges/universities, it is a master's plus additional coursework. The survey also

EXHIBIT 1

PERSONAL AND EDUCATIONAL CHARACTERISTICS OF FACULTY, BY INSTITUTION TYPE

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Age					7.1
<31	3.5%	5.0%	5.3%	4.3%	
31-40	28.0	30.1	25.2	28.1	
41-50	34.8	33.3	32.7	34.0	
51-60	24.6	20.8	27.9	24.2	
61+	9.2	10.8	8.9	9.6	
Average Age	44.8 years	44.5 years	45.2 years	44.8 years	
Gender					8.2**
Female	36.4%	27.5%	31.6%	33.0%	
Male	63.6	72.5	68.4	67.0	
Ethnicity					2.7
White	91.0%	92.1%	89.7%	91.1%	
Black	3.7	4.4	5.4	4.2	
Other	5.3	3.5	4.9	4.7	
Education					275.0***
< Bachelor's	18.1%	36.5%	5.7%	20.9%	
Bachelor's only	6.5	14.6	3.1	8.2	
Bachelor's +	14.6	18.4	8.8	14.6	
Masters	16.8	12.9	23.7	17.0	
Masters +	37.5	16.1	32.9	30.6	
Doctorate	6.5	1.5	25.9	8.7	
Outside Training					28.3***
Yes	80.9%	86.3%	68.1%	80.0%	
No	19.1	13.7	31.9	20.0	
Weekly Salary					21.5**
< 400	14.6%	16.2%	21.6%	16.4%	
401-500	24.2	33.1	24.0	26.7	
501-600	27.1	26.2	25.0	26.7	
601-700	15.7	12.9	17.2	15.2	
701-800	8.7	6.6	6.4	7.7	
801+	9.8	5.0	5.9	7.7	
Average Weekly Salary	$558.27	$520.48	$516.66	$539.64	

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

asked whether the respondents had received nonschool-based training in the subject areas that they teach (e.g., apprenticeship, on-the-job training.) The formal educational differences of instructors across the three institution types are somewhat mitigated by these other training experiences. Over 85 percent of the instructors at technical institutes have participated in non-school-based training; whereas about 68 percent of the instructors at colleges/universities have had such training.

The exhibit shows weekly salaries (unadjusted for hours worked) for the instructors as well. The average weekly salaries of instructors at community/junior colleges are approximately 8% higher than the salaries of the faculty at the other two types of institutions. In a later section of this paper, we analyze the influences of various factors on salaries in more detail and adjust for part-time versus full-time differences.

In summary, the national average age of the postsecondary occupational education faculty is about 45, ninety percent of these faculty are white, and males outnumber females by about 2 to 1. At technical institutes, the faculty have less formal education, have more nonschool-based training, and are disproportionately male. At community/junior colleges, the median level of education is the master's degree, monthly salaries are relatively high, and there are relatively more females. At colleges/universities, the faculty have the highest levels of educational attainment, have the lowest levels of nonschool-based training, and have relatively low salaries.

Job characteristics. The second set of faculty descriptors to be examined are various job-related characteristics. Exhibit 2 displays summary data concerning these issues. On average, the instructors at community/junior colleges teach the most courses (unadjusted for whether the institution is on a semester, quarter, or other basis) in a given year--7.1 as compared to 5.7 and 6.8 for technical institutes and colleges/universities, respectively. Although faculty at technical institutes seem to teach the fewest number of courses in a year, they report the greatest number of contact hours per week in the classes that they do teach--23.1 hours per week as compared to 17.2 for community/technical colleges and 14.6 for colleges/universities. The average class size for technical institutes is smaller than for the other two types of institutions by about 10%.

The activities engaged in outside of the classroom is also an important characteristic of an instructor's job. The exhibit shows that the relatively low number of average (in-class) contact hours are offset somewhat by relatively high amounts of time spent in official office hours and in class preparation time for community/junior college and college/university faculty. The latter two groups average almost 16 hours per week in these two activities compared to about 10 hours per week for the technical

EXHIBIT 2

JOB CHARACTERISTICS AS REPORTED
BY FACULTY, BY INSTITUTION TYPE

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. courses/credit hours taught in previous years	7.1/28.5	5.7/19.3	6.8/24.7	6.7/25.2	NA
Ave. contact hours per week per grading period	17.2	23.1	14.6	18.4	NA
Ave. class size	19.3	17.3	20.1	18.9	NA
Ave. hours outside of class for--					
Official office hours	6.7	4.2	6.9	6.1	97.0***
Class preparation	8.6	6.5	9.7	8.2	82.1***
Undertaking research	2.0	2.5	2.5	2.2	25.6***
Extracurricular activities	1.5	1.3	1.7	1.5	28.2***
Working for pay at 2nd job	5.6	6.9	4.9	5.6	12.8
Background reading in subject area	4.6	4.5	4.8	4.6	11.9
Total[a]	47.4	44.9	49.2	48.1	NA
Ave. rated influence that faculty member had on[b]--					
Establishing new courses	3.80	3.77	3.74	3.78	14.3*
Selecting content of courses	4.40	4.36	4.54	4.41	10.1
Selecting instructional techniques	4.70	4.60	4.80	4.69	21.9***
Selecting textbook	4.45	4.45	4.54	4.47	10.1
Ave. rated influence on determination of curriculum of[b]--					
State voc ed plan	2.76	3.55	2.12	2.87	163.2***
SOICC	2.29	2.65	1.79	2.30	82.0***

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
State employment service	2.09	2.26	1.66	2.06	53.9***
Technical advisory committee	3.69	3.88	3.05	3.62	66.3***
Employer survey	3.50	3.67	2.99	3.45	42.6***
Supervisory observation of teachers					
Ave. percentage observed at least once in last year	63.7	75.9	45.0	63.3	121.9***
Ave. # of times observed (given observed at least once)	2.8	4.2	2.0	3.2	NA
Ave. rating of adequacy of materials and equipment[c]	1.90	1.75	1.79	1.84	12.6**
Percentage covered by collective bargaining	43.1	38.9	20.1	39.6	40.8***

[a]Total includes other activities not listed in the table. It does not give unduplicated time outside of class.
[b]Scale ranges from 1 (none) to 5 (a great deal).
[c]Scale ranges from 1 (very current, up-to-date) to 4 (very dated, outmoded).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

institute faculty. For the other categories of time usage outside of class, there are only minor differences across the three types of institutions. Interestingly, about half of all instructors report working for pay at a second job; about two-thirds of these (or about one-third of the total sample) were self-employed and about one-third were working for somebody else.

Note that while the total reported hours spent in outside activities seem excessive, particularly when those hours are added to the in-class contact hours, care must be taken in interpretation. First, the average total hours is calculated by summing average hours in each activity; and average totals often are skewed by their components. Second, the response categories are not mutually exclusive--e.g., official office hours can be used for background reading, counseling students, or even outside work.

Another job characteristic of importance to faculty is the degree of professional autonomy or independence that they have in decisions of course content and instructional delivery. The faculty were asked to what extent they influence the following four aspects of instruction: (1) establishing a new course in the curriculum, (2) selecting the content of courses they teach, (3) selecting instructional techniques, and (4) selecting textbooks. A five-point scale was used for this question and the exhibit shows that the faculty have considerable autonomy/influence on these matters, with the exception of developing new courses. Somewhat surprising, given the stereotypical picture of the independent nature of colleges/universities, professional autonomy of the instructors is similar to that of faculty at community/junior colleges and technical institutes. However, the faculty were also asked about external influences on the curricula in their programs or departments. Technical institute instructors rated the influence of 5 external factors--the state vocational education plan, the SOICC, the employment service, technical advisory committees, and employer surveys--as greater than either community/junior colleges or college/university faculty. Indeed, the college/university faculty were least influenced by the external agencies.

Considerable differences also emerge in the frequency with which the faculty are observed in the classroom by the chairperson of their department. In the year previous to the survey, two-thirds to three-quarters of the faculty at the community/junior colleges and technical institutes, but less than half of the instructors at colleges/universities had been observed. Furthermore, for those faculty that had been observed, the average number of times they had been observed was greater at 2-year institutions.

Another important dimension of the faculty's jobs is the adequacy of instructional materials and equipment. Faculty at

community/junior colleges show the most discontent as measured by the rating scale used in this survey question; whereas the faculty at the other two types of institutions seem reasonably happy with their instructional materials and equipment resources.

Finally, about 40% of the faculty at type 1 and type 2 institutions report that their salaries are determined by collective bargaining agreements, whereas only half that many of the faculty at 4-year institutions are similarly covered by collective bargaining.

Perceptions of program goals. Exhibit 3 shows how the faculty ranked various goals that are associated with their occupational programs. At all three types of institutions, faculty report that the top goal is "to provide students with the competencies needed to become employed," followed by "place students in training-related jobs" and "develop a work ethic." Similar consistency between institutions is found for the least important two goals--"to promote access and equity" and "to place students in jobs whether or not they are related to training."

Perceptions of personnel and salary policies. Postsecondary occupational education institutions rarely have explicit policies established about criteria for determining salaries. Faculty were asked to rate the influence of various factors salaries using a scale that ranged from 1 (A great deal) to 4 (None or not applicable). Exhibit 4 presents the average rank for each factor. The three most important factors at all institution types are full- or part-time status, educational level, and years of service. Community service and interaction with employers are consistently among the lowest rated factors. At both types of 2-year institutions, research and professional activities are rated fairly low, whereas at the colleges/universities, these factors are rated higher. Perhaps most telling is that quality of teaching fared rather poorly at all institutions. For the overall sample, it was ranked 6th out of 10 as a determinant of salaries.

The exhibit also shows the extent to which faculty perceive there are opportunities for staff development and inservice training. Clearly, the faculty at technical institutes feel there are such opportunities for them, whereas the faculty at the community/junior colleges and colleges/universities are in less agreement with that statement.

Instructional delivery characteristics. Among the many dimensions of instructional delivery, the faculty survey included questions concerning grading criteria, emphases on basic skills, number and types of examinations, and use of individualized learning techniques. Exhibit 5 displays summary statistics from these data.

EXHIBIT 3

FACULTY PERCEPTIONS OF OCCUPATIONAL PROGRAM GOALS, BY INSTITUTION TYPE[a]

Goal	Institution Type			Total	χ2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Place students in training-related jobs	3.36	2.53	3.56	3.16	45.3***
Provide students with competencies needed to become employed	2.44	2.29	2.68	2.44	17.9
Place students	6.46	6.22	6.37	6.38	12.0
Career awareness	3.98	4.53	3.78	4.10	59.1***
Occupational exploration	4.58	5.28	4.51	4.77	41.2***
Develop work ethic	3.44	3.15	3.26	3.32	22.9*
Enhance basic skill	4.65	4.50	4.60	4.60	30.4***
Access and equity	5.84	5.79	5.79	5.82	14.0

[a]Entries are average ranking on a scale from 1 (highest priority) to 8 (lowest priority).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

EXHIBIT 4

FACULTY PERCEPTIONS OF INSTITUTIONAL PERSONNEL AND SALARY POLICIES, BY INSTITUTION TYPE

Policy	Institution Type: Community and Junior Colleges	Technical Institutes	Colleges and Universities	Total	χ^2
Ave. rated influence of factors on salary determination[a]					
Quality of teaching	3.01	3.00	2.37	2.88	68.7***
Professional activity	3.12	3.25	2.49	3.04	94.7***
Service to community	3.34	3.48	2.92	3.30	71.5***
Collective bargaining	2.62	2.88	3.24	2.81	37.2***
Employer interaction	3.41	3.38	3.28	3.37	7.2
Longevity	1.86	1.92	2.34	1.98	59.5***
Full-time or part-time	1.58	1.87	1.78	1.70	20.1***
Number of courses taught	2.37	3.09	2.56	2.61	99.6***
Educational level	1.81	1.83	1.80	1.81	17.7***
Research	3.55	3.61	2.82	3.43	84.2***
Ave. extent of agreement with statement that there are many opportunities for staff development[b]	3.27	3.60	3.13	3.34	39.1***

[a]Scale ranges from 1 (very important) to 4 (none or not applicable).
[b]Scale ranges from 1 (strongly agree) to 5 (strongly disagree).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

EXHIBIT 5

CHARACTERISTICS OF INSTRUCTIONAL DELIVERY
IN POSTSECONDARY OCCUPATIONAL EDUCATION,
BY TYPE OF INSTITUTION

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. rated importance of following criteria in grading[a]:					
Absolute level of achievement	3.35	3.38	3.49	3.39	9.6
Achievement relative to rest of class	2.53	2.47	2.64	2.53	9.9
Individual improvement/progress	3.16	3.35	2.86	3.16	50.1***
Effort	3.26	3.48	2.92	3.26	61.7***
Class participation	3.05	3.29	2.85	3.08	45.2***
Ave. number of exams/week	.34	.51	.31	.38	NA
Ave. number of quizzes/week	.26	.45	.25	.32	NA
Ave. percentage of examinations that are--					
Objective	49.1	42.8	51.7	47.8	NA
Subjective	20.2	15.8	25.6	20.0	NA
Demonstrative	31.6	41.0	22.9	32.6	NA
Ave. percentage of classtime spent on--					
Reading skills reinforcement	1.02	1.41	.68	1.07	31.8***
Math skills reinforcement	1.39	2.07	1.17	1.54	47.2***
Ave. percentage of classtime spent on--					
Daily maintenance activities	7.69	10.17	5.33	7.95	NA
Instruction	52.62	38.27	64.34	50.74	NA
Student practice	39.29	50.99	30.22	40.92	NA

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. percentage of students formally recognized for performance	19.1	35.3	10.8	22.0	NA
Percentage of faculty that receive student evaluations	91.1	74.1	95.2	87.0	74.5***
Percentage of faculty that report individualized teaching/learning activities are integral to program	82.2	92.9	74.6	83.9	66.9***

[a]Scale ranged from 1 (not important) to 4 (very important).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

Comparisons across institution types show many striking findings concerning grading criteria. On average, the faculty at all three types of institution place great emphasis on absolute levels of achievement and low emphasis on achievement relative to the rest of the students in the class. However, significant differences appear in the data for individual progress, effort, and class participation across the three types of institutions. In the occupational programs at college/university settings, the three grading criteria of "Individual improvement/progress," "Effort," and "Class participation," are rated, on average, as less than moderately important. At technical institutes, however, these three criteria are just as, or more important than, the absolute level of achievement. The averages for community/junior college classes are halfway in between the other two types of institutions.

Frequency and types of student evaluations and feedback are also key aspects of instructional delivery. The respondents were asked to report frequency of exams and quizzes and the types of questions on examinations--objective, subjective, or student demonstration. The instructors at technical institutes average one examination and one quiz every two weeks and indicate that the exams are comprised of objective or demonstration-type questions. At the community/junior college and college/university programs, exams and quizzes are less frequent--about once every three weeks on average--and rely less on demonstrations.

The greater use of demonstration-type exams at the technical institutes probably indicates a greater "hands-on" approach to instruction. Furthermore, the faculty at technical institutes report that over half of class time, on average, is spent on student practice. This compares to 40 percent at community/junior colleges and 30 percent at college/university programs.

Another instructional characteristic that varies greatly across institution types is the frequency with which the faculty formally recognize students for good performance (i.e., displaying or reading students' work.) At colleges/universities, the faculty formally recognize about 1 in 10 students in their classes; at community/junior colleges, about 1 in 5; whereas at technical institutes, the ratio is about 1 in 3.

Student characteristics. The model that is being investigated here suggests that instructional delivery interacts with student characteristics to "produce" outcomes. Exhibit 6 summarizes data from faculty responses to attitudinal questions concerning students and presents student profiles as reported by the faculty. Because the norms may vary among institutions, it is difficult to interpret the attitudinal data with great precision. The averages presented in the exhibit indicate that the faculty from all types of institutions generally concur that their students are below average in terms of substance abuse and that

EXHIBIT 6

FACULTY PERCEPTIONS OF STUDENT CHARACTERISTICS, BY INSTITUTION TYPE

Characteristic	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. agreement with statement that[a]--					
Substance abuse by students is below average	3.43	3.48	3.58	3.47	17.9*
Student tardiness/ absences are very prevalent	2.58	2.69	2.56	2.61	13.4
Student attitudes are not conducive to learning	2.18	2.26	2.18	2.20	9.9
Gender					
Female	49.1%	41.6%	48.1%	46.8%	NA
Male	50.9	58.4	51.9	53.2	NA
Race/Ethnicity					
White	76.3%	79.8%	81.2%	78.2%	NA
Black	11.4	15.3	10.5	12.3	NA
Hispanic	7.1	2.4	2.8	5.0	NA
Other	4.8	1.8	5.1	4.0	NA
Percentage handicapped	2.3	3.2	2.4	2.5	NA
Percentage LEP	5.3	3.7	5.1	4.8	NA
Percentage econ. disadvantaged	22.5	27.4	14.5	22.4	NA
Percentage JTPA clients	5.5	12.9	1.3	6.8	NA
Percentage single parents	14.0	14.1	7.0	12.7	NA
Percentage students over age 24	40.7	39.2	21.7	36.7	NA
Percentage of students that did not intend to complete when they enrolled	13.3	10.1	5.9	11.0	NA

[a]5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

student tardiness/absences are not prevalent. (Note that the levels of agreement/disagreement were not strong, indicating that some faculty probably consider substance abuse and tardiness/absences to be important problems.) The faculty disagree more uniformly that their students have attitudes that are not conducive to learning. That is, they generally feel that student attitudes are conducive.

The student profiles reported by the faculty exhibit some variation across institution types. Technical institutes have a higher proportion of males and a higher proportion of students that are JTPA clients than do the community/junior colleges or colleges/universities. The two types of 2-year institutions--technical institutes and community/junior colleges have higher percentages of economically disadvantaged students, single parent students, and students over the age of 24 than do the programs at colleges/universities.

Low student completion rates have been a controversial issue for postsecondary occupational education programs. Advocates of the occupational education system retort to the criticism of low that students often enroll with little or no intention of completion. They have other motives such as upgrade training in a particular course or two, career exploration, or avocational interests. In fact, the faculty sense that this phenomenon holds true for about 10 percent of their students--with slightly higher percentages at technical institutes and slightly lower at colleges/universities.

Organizational and student outcomes. The purpose of the National Center for Research in Vocational Education's survey of institutions was to gather current data concerning instructional delivery and student choices, rather than student outcomes. However, data from a battery of attitudinal questions on "campus atmosphere" and perceptions of student completion rates do measure organizational and student outcomes to some extent. Exhibit 7 presents summary data from these measures.

The responses to the 4 organizational attitude questions on campus climate all varied by institution type with statistical significance. The technical institutes have the most favorable climate as measured by agreement or disagreement with the following statements:

- Staff members in this institution don't have much school spirit.
- This institution seems like a big family.
- There is very little cooperative effort among this institution's staff members and students.

EXHIBIT 6

FACULTY PERCEPTIONS OF STUDENT CHARACTERISTICS, BY INSTITUTION TYPE

Characteristic	Institution Type			Total	F
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. agreement with statement that[a]--					
Substance abuse by students is below average	3.43	3.48	3.58	3.47	17.9*
Student tardiness/ absences are very prevalent	2.58	2.69	2.56	2.61	13.4
Student attitudes are not conducive to learning	2.18	2.26	2.18	2.20	9.9
Gender					
Female	49.1%	41.6%	48.1%	46.8%	NA
Male	50.9	58.4	51.9	53.2	NA
Race/Ethnicity					
White	76.3%	79.8%	81.2%	78.2%	NA
Black	11.4	15.3	10.5	12.3	NA
Hispanic	7.1	2.4	2.8	5.0	NA
Other	4.8	1.8	5.1	4.0	NA
Percentage handicapped	2.3	3.2	2.4	2.5	NA
Percentage LEP	5.3	3.7	5.1	4.8	NA
Percentage econ. disadvantaged	22.5	27.4	14.5	22.4	NA
Percentage JTPA clients	5.5	12.9	1.3	6.8	NA
Percentage single parents	14.0	14.1	7.0	12.7	NA
Percentage students over age 24	40.7	39.2	21.7	36.7	NA
Percentage of students that did not intend to complete when they enrolled	13.3	10.1	5.9	11.0	NA

[a]5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

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- Staff members in this institution don't have much school spirit.
- This institution seems like a big family.
- There is very little cooperative effort among this institution's staff members and students.

EXHIBIT 7

FACULTY PERCEPTIONS OF
ORGANIZATIONAL AND STUDENT OUTCOMES,
BY INSTITUTION TYPE

Outcome	Institution Type			Total	χ^2
	Community and Junior Colleges	Technical Institutes	Colleges and Universities		
Ave. agreement with statement that[a]--					
Staff members don't have much school spirit	2.57	2.35	2.42	2.48	28.6***
This institution seems like a "big" family	3.01	3.25	3.21	3.11	32.4***
Very little cooperation effort among staff and students	2.15	2.04	2.13	2.12	14.1*
A very "positive" climate exists here	3.42	3.63	3.58	3.51	16.2*
Percentage of students that leave prog/dept before completion					
Leave program, but not school	11.5	6.9	9.7	9.9	NA
Leave program and school	19.2	21.5	12.5	18.6	NA

[a]5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Statistically significant at the .10 level (one-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

- A very positive "climate" exists in this institution.

Colleges/universities closely resemble the technical institutes in these outcomes. The community/junior colleges seem to have the least positive organizational outcomes.

The faculty at the college/university programs report that about 20 percent of students don't complete programs either because they transfer to a different program at the institution or because they leave the institution altogether. The noncompletion rates at the technical institutes and community/junior colleges are about 30 percent.

With these descriptive comparisons as background, the next section of the paper presents estimates from multivariate models of faculty salaries, aspects of instructional delivery, and organizational outcomes. The models are based on the general schema presented in figure 1.

Multivariate Models of Faculty Salaries and Instructional Delivery

Faculty Salaries

A standard human capital model for explaining faculty earnings was estimated in a multiple regression framework. The explanatory variables include personal characteristics and educational background of the faculty member, job characteristics such as part- or full-time status and number of courses taught, indicators of instructional style, and institutional characteristics. Weekly salaries are used as the dependent variable in order to normalize for factors such as different length academic periods. Exhibit 8 provides the estimates for the model. Note that the mean weekly salary for the sample was $538 (equivalent to about $28,000 on an annual basis [1987 dollars].)

Among personal characteristics, age and experience have the expected positive signs indicating that salaries are larger as individuals get older, holding all other variables (including experience) constant, and salaries are larger for individuals with more experience, holding all other variables (including age) constant. Female instructors experience a salary disadvantage of approximately 10 percent according to this data. Interestingly, minority status is associated with a $36/week advantage in salary (about 6 percent). Finally, geographic region of the country affects salary levels as well. It was hypothesized that cost of living differentials in the Northeast and West would be reflected in higher salaries, and, indeed, this was the case.

Hypotheses about the positive effects of personal education background on salaries are sustained in the model estimates,

EXHIBIT 8

ESTIMATES FROM A MODEL OF THE SALARIES OF INSTRUCTORS

(Salaries converted to weekly basis)

Variable	Estimate	t-ratio
Institutional Characteristics		
Community/junior college[a]	53.14	3.70***
Technical institute[a]	50.14	2.82***
Salary determined by collective bargaining	23.01	1.92*
Instructional Style		
Find student evaluations useful	-.99	-.09
Percentage of students formally recognized for performance	-.31	-1.72*
Supervises cooperative ed. experiences	-16.70	-1.43
Individualized instruction used in programs	-11.09	-.80
Job Characteristics		
Part-time	-98.91	-5.90***
Number of courses taught in previous year	-4.91	-3.61***
Number of contact hours/week	-1.25	-1.91*
Average size of classes	1.01	1.45
Has supervisory responsibility	52.37	4.42***
Research activities are an important factor in salary	26.83	1.74*
Educational Background		
Level of education	4.14	1.21
Ph.D.	28.17	1.34
State teaching certification attained	25.34	2.23***
Nonschool based training	7.95	.63
Personal Characteristics		
Age (in years)	7.82	1.84*
Age squared	-.07	-1.45
Experience (in years)	3.40	1.80*
Experience squared	.05	.79
Female	-48.67	-4.24***
Minority	35.88	2.09**
Region (Northeast or West)	39.40	3.33***
Mean of dependent variable	538.19	
Observations	1051	
Adjusted R-squared	.2178	

[a]Omitted category is university/college programs.

*Statistically significant at the .10 level (two-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

although not with strong statistical significance. The attainment of state instructional certification results in a $25/week higher salary. The level of education variable that was used in the model is a scale variable that ranges from 1 (high school diploma) to 8 (doctorate). As expected, this variable is positively related to salary, although it is not statistically significant. To test for a certification effect, a dummy variable was entered into the model for having a doctorate. Again, although it lacks statistical significance there appears to be a $28/week advantage (about 5 percent).

Most of the variables representing job characteristics have significant effects. The well-recognized part-time status disadvantage produces the largest effect of any of the variables. Holding all other factors constant such as number of courses taught, contact hours, level of education, and so forth, being a part-time instructor reduces salary levels by almost 20 percent ($99/week).

Instructors with supervisory responsibilities in their department/program are remunerated accordingly. These individuals receive about $52/week more than they would otherwise receive in the absence of such supervisory duties. Despite the fact that these institutions purport to de-emphasize research, the model results indicate that there is a significant wage advantage in departments where research activities are an important factor in salary determinations over departments where research is not emphasized. Contrary to prior hypotheses, the number of courses taught in the previous year and the current number of contact hours/week are <u>negatively</u> related to salary levels.

Several instructional method-type variables were entered into the model to test whether such factors influence salaries. The hypotheses were that "positive" instructional techniques such as positive feedback, responding to student evaluations, and supervising cooperative education experiences would be positively related to salaries. In fact, just the opposite occurs. In particular, the extent to which an instructor recognizes students formally for good performance is negatively related to salaries. An instructor who recognizes half of their class for performance receives about $15 less per week than an otherwise identical instructor who formally recognizes no students. In the exhibit, it can be observed that the other instructional style variables are also negatively related to salaries, but are not statistically significant.

The final set of variables comprising the model were those that characterized the institution. Community/junior college faculty and instructors at technical institutes both receive higher salaries than their counterparts at the occupational programs at colleges/universities ($53/week and $50/week, respectively.) Institutions that have collective bargaining

arrangements also pay higher salaries according to the estimates of this model, (approximately $23/week.)

In summary, the model that was estimated with the faculty data from the national survey shows the following:

Factors that increase salaries	Factors that reduce salaries
Age	Female
Experience	
Minority	Part-time employment
Northeast or West region	Number of courses taught in previous year
Attained state certification	Contact hours/week
Research activities are an important factor in salaries	Percentage of students formally recognized for performance
Has supervisory responsibility	
Community/junior college	
Technical institute	
Collective bargaining	

Instructional Delivery Models

The structural equations that comprise the model illustrated in figure 1 of this document may be written as follows:

(1) $INSTRUC = a_1 + b_1\ PERS + b_2\ EDUC + b_3\ JOB + b_4\ INSTIT + b_5\ MISSION + b_6\ INCENTIVES + e_1$

(2) $OUTCOME = a_2 + c_1\ INSTRUC + c_2\ STUDENTS + e_2$

where:

INSTRUC = measure of instructional delivery

PERS = vector of personal characteristics

EDUC = vector of educational background characteristics

JOB = vector of job characteristics

INSTIT = vector of institutional characteristics

MISSION = vector of perceived salary determinants

OUTCOME = measure of organizational or student outcomes (climate and student completions)

STUDENTS = vector of perceived student characteristics

e_1, e_2 = error terms

The estimation strategy that was followed was to estimate equation (1) and a reduced form equation for outcomes. That equation is as follows:

$$(3)\ \text{OUTCOME} = a_3 + d_1\ \text{PERS} + d_2\ \text{EDUC} + d_3\ \text{JOB} + d_4\ \text{INSTIT} + d_5\ \text{MISSION} + d_6\ \text{INCENTIVES} + d_7\ \text{STUDENTS} + e_3$$

where the variables are defined above.

Instructional methods. Exhibit 9 presents the estimates from equations that model instructional method as specified in equation (1). Three dependent variables (representing INSTRUC) were used in the analysis--percentage of class time spent directly in instruction (as opposed to maintenance activities or student practice), importance of effort as a grading criterion, and percentage of students formally recognized for performance.

Institutional characteristics are important explanatory variables for all three dependent variables. Instructors at community/junior colleges and technical institutes, as well as instructors at institutions that have a collective bargaining mechanism in place, spend a smaller amount of in-class time on direct instruction than do instructors in university/college programs or than do instructors in institutions without collective bargaining. This result coincides with the emphases placed on student practice at community/junior colleges and technical institutes. On the other hand, these institutional characteristics are positively related to the percentage of students formally recognized for performance and to the importance placed on effort as a grading criterion.

Among the job characteristics, average class size increases the percentage of time spent in instruction (it is more difficult to monitor student performance with large classes) and decreases the importance of effort as a grading criterion (it is more difficult to keep track of individual students in large class size settings.) If the instructor feels that the equipment available for instruction is less than adequate, then this has a negative influence on all three instructional delivery methods, although this relationship is significant only for percentage of students formally recognized.

The model estimates for the variables identified as measuring perceptions of institutional mission indicate that (at least some of) the mission perceptions affect instructional delivery. Most dramatic is the effect of "developing work ethic" as a mission goal. The higher is this priority, the lower is the percentage of

EXHIBIT 9

ESTIMATES FROM A MODEL OF
INSTRUCTIONAL DELIVERY

(standard errors in parentheses)

Variable	Dependent Variable		
	Percentage of classtime spent in instruction	Importance of effort as grading criterion	Percentage of students formally recognized for performance
Institutional Characteristics			
Community/junior college[a]	-7.59***	.27***	4.75*
	(1.99)	(.07)	(2.60)
Technical institutes[a]	-13.94***	.32***	15.46***
	(2.40	(.09)	(3.13)
Salary determined by collective bargaining	-2.74*	.16***	7.00***
	(1.51)	(.05)	(1.97)
Job Characteristics			
Part-time	-2.64	.22**	3.11
	(1.99)	(.07)	(2.60)
Average class size	.64***	-.01**	-.17
	(.09)	(.00)	(.12)
Has supervisory respons.	-1.28	.20***	.06
	(1.55)	(.06)	(2.02)
Less than adequate equipment	-2.05	-.02	-3.04*
	(1.41)	(.05)	(1.84)
Perceptions of Institutional Mission[b]			
Training-related placement	.16	-.01	-1.42**
	(.34)	(.01)	(.44)
Provide students with basic competencies	.20	-.01	-.38
	(.37)	(.01)	(.49)
Placement unconditional on training field	.16	-.00	-.28
	(.36)	(.01)	(.47)
Career awareness	-.40	.00	-.75
	(.41)	(.01)	(.53)
Career exploration	-.69*	-.03**	-.91*
	(.39)	(.01)	(.51)
Develop work ethic	1.32***	-.05***	-1.28**
	(.41)	(.01)	(.53)
Enhance basic academic skills	-.28	.01	.03
	(.36)	(.01)	(.48)
Promote access and equity	-.69**	-.02	-.30
	(.01)	(.40)	(.35)

Variable	Dependent Variable		
	Percentage of classtime spent in instruction	Importance of effort as grading criterion	Percentage of students formally recognized for performance
Perceptions of salary incentives[c]			
Importance of quality of teaching	-.75	.01	1.58
	(.84)	(.03)	(1.10)
Importance of professional activities	-.15	.09**	-.19
	(1.00)	(.04)	(1.31)
Importance of research activities	-1.50	.01	.89
	(.97)	(.04)	(1.27)
Agreement with statement that there are many staff development opportunities	.08	.02	.57
	(.62)	(.02)	(.81)
Educational background			
Level of education	2.61***	-.06***	-1.73***
	(.45)	(.02)	(.58)
Ph.D.	-.76	.01	6.08*
	(2.77)	(.10)	(3.62)
State teaching certificate attained	-10.78***	.21	10.54***
	(1.47)	(.05)	(1.92)
Non school-based training	-2.09	.09	5.25**
	(1.65)	(.06)	(2.15)
Personal characteristics			
Age (in years)	-.01	.00	.14
	(.08)	(.00)	(.10)
Experience (in years)	-.19*	-.01**	-.17
	(.11)	(.00)	(.14)
Female	-3.91***	-.03	3.60*
	(1.50)	(.05)	(1.96)
Minority	-3.69	.06	.44
	(2.32)	(.08)	(3.03)
Mean of dependent variable	50.73	3.27	22.29
Observations	1051	1051	1051
Adjusted R-squared	.2714	.1674	.1619

[a]Omitted category is university/college programs.
[b]Rankings on a scale from 1 (most priority) to 8 (least priority). Thus sign of coefficient is reversed.
[c]Scale ranges from 1 (not important) to 4 (very important).

*Statistically significant at the .10 level (two-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

class time spent on instruction (i.e., more time is spent on student practice), (b) the higher the importance of effort as a grading criterion, and (c) the higher the percentage of students formally recognized for performance. "Career exploration" as a goal has similar effects; except that the higher the priority, then the higher the percentage of class time spent in instruction. (This may be explained by instructors attempting to cover more substantive areas, which would take more instructional time.) "The training-related placement" goal, ranked at these institutions, has a strong positive effect on percentage of students formally recognized.

For the most part, perceptions about influences on salary determinants does not affect instructional delivery. Only one of 12 coefficients is significant.

The educational backgrounds of instructors are good indicators of instructional method. The higher the level of education that an instructor has attained, (a) the higher the percentage of class time devoted to instruction, (b) the lower the importance of effort as a grading criterion, and (c) the lower the percentage of students formally recognized for performance. Dummy variables indicating that the instructor has attained a state teaching certificate and that the instructor has received additional training in a nonschool-based setting both have exactly opposite influences on methods as does level of education. That is, these attributes are related to a lower percentage of class time devoted to instruction, more emphasis on effort, and a higher percentage of students formally recognized.

Finally, the exhibit shows that female instructors, all other things being equal, tend to spend less class time in instruction and tend to recognize students formally at a higher rate than do instructors. Experience is negatively related to all three dependent variables.

Institutional and student outcomes. Exhibit 10 presents the estimates from equations that represent the reduced form model (3). Four institutional outcomes were analyzed--level of agreement with the statements, "Staff members have a lot of school spirit," "Institution seems like a family," "Staff and students cooperate well with each other," and "There is a very positive climate at this institution." In addition, one student outcome was analyzed--the percentage of students that complete programs. (The organizational outcome variables and student completion rate are the OUTCOME variables in (3).)

The institutional type seems to have only a minor impact on these outcomes. Community/junior colleges and technical institutes have a negative effect on closeness and on program completion. Having a collective bargaining mechanism in place has no influence on any of these outcomes, however.

EXHIBIT 10

ESTIMATES FROM A REDUCED FORM MODEL OF INSTRUCTIONAL AND STUDENT OUTCOMES

(standard errors in parentheses)

Variable	Institutional Outcomes				Student Outcomes
	Staff members have a lot of school spirit	Institution seems like a family	Staff and students cooperate well	A very positive climate	Program Completion Rate
Institutional Characteristics					
Community/junior college[a]	-.10	-.24**	.08	-.11	-3.24
	(.11)	(.10)	(.08)	(.09)	(2.11)
Technical institute[a]	.02	-.15	.14	-.02	-7.37***
	(.13)	(.12)	(.10)	(.12)	(2.61)
Collective bargaining	-.08	-.02	.07	-.06	-.14
	(.08)	(.08)	(.06)	(.07)	(1.65)
Job Characteristics					
Number of courses taught last year	.00	-.02**	.00	-.01	-.18
	(.01)	(.01)	(.01)	(.01)	(.19)
Part-time	.17	-.08	-.03	.00	4.92**
	(.11)	(.11)	(.09)	(.10)	(2.27)
Ave. class size	-.00	-.01***	-.01*	-.01**	-.02
	(.00)	(.00)	(.00)	(.00)	(.09)
Has supervisory resp.	.10	.04	-.04	.06	.17
	(.08)	(.07)	(.06)	(.07)	(1.61)
Less than adequate equipment	-.11	-.10	-.15***	-.11*	-.67
	(.07)	(.07)	(.06)	(.07)	(1.46)
Contact hours/week	.00	.00	.00	.00	-.06
	(.00)	(.00)	(.00)	(.00)	(.09)
Perceptions of Institutional Mission[b]					
Training-related placement	-.02	-.05***	.01	-.01	-.24
	(.02)	(.02)	(.01)	(.02)	(.35)
Provide student with basic competencies	-.02	-.00	.00	-.01	-.07
	(.02)	(.02)	(.01)	(.02)	(.38)
Placement unconditional on training field	.02	.03*	.02*	.01	-.20
	(.02)	(.02)	(.01)	(.02)	(.36)
Career awareness	.03	-.02	.02	.00	.07
	(.02)	(.02)	(.02)	(.02)	(.42)
Career exploration	-.01	-.02	.00	.00	-.14
	(.02)	(.02)	(.02)	(.02)	(.41)
Develop work ethic	-.01	-.03	.00	-.00	-.05
	(.02)	(.02)	(.02)	(.02)	(.42)
Enhances basic academic skills	-.01	-.03*	.00	-.01	-1.12***
	(.02)	(.02)	(.01)	(.02)	(.37)
Promote access and equity	-.04**	-.03*	.00	-.01	.07
	(.02)	(.02)	(.01)	(.02)	(.36)

Variable	Institutional Outcomes				Student Outcomes
	Staff members have a lot of school spirit	Institution seems like a family	Staff and students cooperate well	A very positive climate	Program Completion Rate
Perceptions of salary incentives[c]					
Importance of quality of teaching	.12***	.12***	.06*	.08**	.77
	(.04)	(.04)	(.03)	(.04)	(.86)
Importance of professional activities	.01	-.04	.04	.01	-.93
	(.05)	(.05)	(.04)	(.05)	(1.02)
Importance of research activities	-.08	-.07	.02	.00	.31
	(.05)	(.05)	(.04)	(.05)	(1.00)
Agreement with statement that there are many staff development opportunities	.20***	.20***	.08***	.26***	.58
	(.03)	(.03)	(.03)	(.03)	(.66)
Instructional Style					
Find student evaluations useful	.09	.15*	.06	.15**	3.32**
	(.08)	(.08)	(.06)	(.07)	(1.63)
Percentage of students formally recognized	-.00	-.00	.00	.00	.05**
	(.00)	(.00)	(.00)	(.00)	(.02)
Supervises coop. ed. experiences	-.15*	.06	.02	-.09	4.25***
	(.08)	(.07)	(.06)	(.07)	(1.60)
Individualized instruction used in program	-.14	-.10	.01	-.10	2.42
	(.09)	(.09)	(.07)	(.09)	(1.89)
Educational Background					
Level of education	-.01	-.01	.03	-.00	-.64
	(.02)	(.02)	(.02)	(.02)	(.48)
Ph.D.	.15	.04	-.06	.06	3.89
	(.14)	(.13)	(.11)	(.13)	(2.88)
State teaching certificate	-.09	.06	.13**	-.01	1.76
	(.08)	(.07)	(.06)	(.07)	(1.57)
Nonschool-based training	-.01	.03	-.02	-.04	.83
	(.09)	(.08)	(.07)	(.08)	(1.70)
Personal Characteristics					
Age	.01*	.00	.00	.00	.14*
	(.00)	(.00)	(.00)	(.00)	(.08)
Experience	-.01**	-.01*	-.01**	-.01**	-.32***
	(.01)	(.01)	(.00)	(.01)	(.11)
Female	.11	.03	.16**	.08	1.88
	(.10)	(.09)	(.08)	(.09)	(1.98)
Minority	-.12	-.21*	.01	.02	.27
	(.13)	(.11)	(.10)	(.12)	(2.57)
Region	-.08	-.08	-.07	-.04	-.55
	(.08)	(.08)	(.06)	(.07)	(1.64)

Variable	Institutional Outcomes				Student Outcomes
	Staff members have a lot of school spirit	Institution seems like a family	Staff and students cooperate well	A very positive climate	Program Completion Rate
Perceptions of Students					
Student substance abuse is below average[d]	.01	.14***	.07***	.10***	-.17
	(.04)	(.03)	(.03)	(.03)	(.71)
Student tardiness and absense is not prevalent[d]	.08**	.04	.08***	.07**	1.69**
	(.04)	(.03)	(.03)	(.03)	(.70)
Students have a positive attitude[d]	.15***	.09***	.14***	.17***	.18
	(.04)	(.04)	(.03)	(.03)	(.77)
Percentage male	-.05	-.32**	-.02	-.19	1.29
	(.14)	(.13)	(.11)	(.12)	(2.77)
Percentage white	-.23	-.37**	.20	-.21	3.76
	(.16)	(.15)	(.13)	(.15)	(3.26)
Percentage handidicapped	.75	.07	.03	.40	-1.57
	(.49)	(.05)	(.38)	(.44)	(9.85)
Percentage LEP	-.03	-.40	-.22	-.13	-8.54
	(.31)	(.28)	(.24)	(.28)	(6.12)
Percentage econ. disadvantaged	-.09	.06	.05	-.03	1.42
	(.16)	(.15)	(.13)	(.15)	(3.23)
Percentage JTPA clients	.31	-.01	-.32	-.41*	-11.92**
	(.27)	(.25)	(.21)	(.24)	(5.43)
Percentage single parents	-.26	-.35	-.26	-.35	-2.26
	(.25)	(.23)	(.19)	(.22)	(4.91)
Percentage over 24	-.09	.02	.08	.08	-.68
	(.14)	(.13)	(.11)	(.13)	(2.79)
Percentage never intended to complete	-.23	-.37**	-.03	-.23	-50.74***
	(.19)	(.18)	(.15)	(.17)	(3.81)
Mean of dependent variable	3.51	3.12	3.88	3.52	22.01
Observations	1016	1016	1016	1016	1016
Adjusted R-squared	.141	.153	.123	.212	.218

[a]Omitted category is university/college programs.
[b]Rankings on a scale from 1 (most priority) to 4 (least priority). Thus sign of coefficient is reversed.
[c]Scale ranges from 1 (not important) to 4 (very important).
[d]5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

*Statistically significant at the .10 level (two-tail test).
**Statistically significant at the .05 level.
***Statistically significant at the .01 level.

Job characteristics are, in general, more closely related to outcomes than general institutional characteristics. Being a part-time instructor is associated with a higher reported rate of student completion, for example. Large class sizes seem to cause negative organizational outcomes--note that this relationship is statistically significant for closeness ("seems like a family"), cooperativeness, and positive climate. Another job characteristic that causes negative institutional outcomes is less than adequate instructional equipment (as reported by the faculty.)

In interpreting the mission variables, it must be borne in mind that a negative coefficient indicates that the higher the priority placed on a mission goal, the more positive the outcome. Thus, the exhibit shows that higher emphasis on training-related placements, enhancing basic academic skills, and promoting access and equity are associated with more positive organizational outcomes. Particularly noteworthy is that placing priority on enhancement of basic academic skills is associated with higher (reported) completion rates. Not unexpectedly, emphasizing the goal of placement of students unconditional on training field is negatively related to organizational outcomes.

One of the most striking and positive results of this model is that two important measures of perceptions of salary incentives are strongly related to organizational outcomes. The importance of quality of teaching in determining salaries and level of agreement with the statement that the institution offers many staff development opportunities are positively related to all four organizational outcomes. These results suggest that institutions that emphasize teaching quality and provide staff development opportunities achieve higher rates of organizational cohesion. Instructors do appear to be motivated by them.

"Finding student evaluations useful" and "formal recognition of students" are intended to measure how well the instructors relate to the students. Both are positively associated with student completion rates. Furthermore, "finding student evaluations useful" is correlated with two of the institutional outcomes. Instructors that supervise cooperative education experiences also report significantly higher completion rates.

The educational background of the instructors has virtually no causal link to any of the outcome variables. Among the personal characteristics, it is clear that "burnout" is happening to experienced instructors. Years of experience is the only variable in the entire model to be significantly related to all five outcomes, and it is negatively associated with all of them. Being a minority faculty member also causes some sense of organizational disenchantment. Minority status was negatively related to a feeling of "family" on campus.

The last group of variables in the model were instructors' perceptions of students. The strongest relationships here were

between the student attitude measures and the organizational outcomes. Three subjective measures of student attitudes that instructors responded to were "Student substance abuse is below average," "Student tardiness and absences are not prevalent," and "Students have a positive attitude." All twelve coefficients for these variables in the models with the four organizational outcomes were positive, and 10 of the twelve were significant. In addition, the lack of student tardiness/absences was positively associated with student completion rates.

Among the other student characteristics, the larger the percentage of male students and the larger the percentage of white students, the less closeness reported by instructors. Postsecondary advocates often counter the criticism of low student completion rates by indicating that many students have motivating factors other than program completion. In some cases, students take employment opportunities. In other cases, students were only interested in one or two courses. This phenomenon seems to be substantiated in these models. The percentage of students who entered programs but never intended to complete them (as reported by instructors), is strongly negatively associated with student completion rates.

Discussion

The purpose of this paper is to examine empirically the determinants of instructional methods and organizational outcomes at postsecondary institutions. Most of the findings are consistent with the model that was specified in figure 1. In addition, the study shows that instructor salaries are determined partially by the human capital attributes of the instructor, but also are influenced heavi y by institutional and job-related characteristics.

The variables that have the most influence, either positively or negatively, on instructional methods are (a) institutional characteristics, (b) class size and adequacy of materials/equipment, (c) perceptions of institutional mission, and (d) education and training of instructors. Instruction at community/junior colleges and technical institutes seems to have much more emphasis on student practice and feedback than instruction at university/college programs. Instructors at the two-year institutions spend a smaller proportion of class time on instruction (as opposed to student practice or maintenance), have more frequent examinations and quizzes, place higher emphasis on effort as a grading criterion, and formally recognize students for their performances more often.

Larger class sizes and inadequacies in materials/equipment seem to result in less emphasis on student practice and feedback. The reasons for these results are likely because it is more difficult to monitor student performance and to keep track of individual students in larger class settings.

An interesting finding is that institutional missions seem to get reflected in what occurs in the classroom. Instructors at institutions that place higher priority on training-related placements, career exploration, or developing "work ethic" tend to spend more time on student practice, and reward/recognize effort and performance of a higher show of students.

The educational backgrounds of instructors are also strongly associated with instructional methods. Instructors with higher levels of formal education tend to rely less on student practice and provide less feedback to students. One can theorize that these instructors are replicating the emphases on the lecture method that predominates in graduate education. In fact, if instructors have state teaching certification, indicative of some instruction in teaching methods, then the negative effect of level of education is attenuated.

A set of variables that are not related to instructional methods are perceptions of the institution's salary/personnel policies. This suggests that such policies are not amenable levers to effecting changes in instructional method.

The factors that best explain organizational outcomes include (a) perceptions of students, (b) perceptions of the institution's salary policies, (c) instructional methods, (d) experience of the instructor, and (e) job characteristics such as class size and adequacy of equipment. The factors that do not seem to have causal links to outcomes include (a) institutional characteristics, (b) institutional mission perceptions, and (c) educational backgrounds of the instructors.

Two important salary policies that are positively associated with organizational outcomes are the importance of teaching quality in determining salaries and the opportunities for staff development for instructors. These relationships suggest that institutions should clearly emphasize the importance of quality teaching in personnel evaluations and salary adjustments and furthermore should work to ensure that staff are afforded opportunities for their own professional development, so long as student completion rates and favorable "climates" are of value.

Perception of student attitudes is also a strong correlate of organizational outcomes. Instructors that hold the most positive attitudes toward students have the most positive attitudes toward the institutions. While this may not seem surprising, it gives a signal that instructors should have input into program enrollment

procedures and that institutions should endeavor to publicize to faculty the qualifications of incoming students.

Among the variables that measure instructional methods, recognition of good performance and use of student evaluations are both positively related to student completion rates. Furthermore, the latter is positively associated with the organizational outcome measures.

Years of experience of the faculty members is negatively associated with all of the outcome measures that were modeled. The strength and consistency of these results suggest that "burnout" may be a problem for experienced instructors at these institutions.

The factors that seem to determine salaries in the present study are (a) institutional factors, (b) job characteristics, and (c) personal characteristics. Instructors at community/junior colleges and technical institutes are compensated at a higher rate than otherwise identical colleagues at university/college programs. Collective bargaining agreements are associated with higher salaries. Among personal characteristics and educational background descriptors, the models that were estimated show that females receive lower pay, individuals of minority ethnicity receive higher pay, and individuals with higher levels of education receive higher pay.

Finally, among job characteristics, part-time instructors, instructors with greater courseloads, and those with greater contact hours are at a salary disadvantage.

REFERENCES

Hollenbeck, Kevin M.; Belcher, James O.; Dean, George D.; Rider, Betty L.; and Warmbrod, Catharine P. Postsecondary Occupational Education Delivery: An Examination. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1987.

Hollenbeck, Kevin. "Postsecondary Occupational Education Delivery: An Examination--Project Overview." Paper presented at Annual Convention of the American Associatio· of Community and Junior Colleges. Las Vegas. April, 1988.