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Gable: Postsecondary Health Occupations Students': Info Processing

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POSTSECONDARY HEALTH OCCUPATIONS STUDENTS' PREFERENCES FOR PROCESSING INFORMATION AND **DECISION-MAKING**

Karen E. Gable¹

ABSTRACT : Applying knowledge of student learning styles has been one response to pressures for educational accountability. The purpose of this study **was to identify** the information and decision-making preferences of students enrolled in different health occupations programs and different educational settings. The findings indicated significant differences existed in the preference scores of **health** occupations education students in various occupational majors. Differentiation of preferences for Sensing existed between educational sites. Four recommendations are made regarding the application of the findings in areas such as instructional design, teacher-student interaction in the learning process, and **career** counseling.

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Background

According to the Bureau of Labor Statistics, "... employment in most of the health occupations is expected to grow faster than the average as population growth--especially the growth in the number of older people--increases the demand for health care" (American Society of Allied Health Professions, 1984, p. 3). Demands will be placed on programs to produce competent practitioners for the 240,800 annual job openings anticipated (Health Occupations Education Division, 1983). However, the constraint of available financial resources and recognition that costs of educational programs to prepare health practitioners are substantially above those of other types of programs, will require that educators and administrators be as cost-effective and educationally efficient as possible (Blagg, 1985; Miller, Beckham & Pathak, 1983).

Increasing pressures, both internal and external, are forcing administrators and educators to evaluate their programs critically in order to be accountable, i.e., effective and efficient, for the resources they have (Ginzberg, 1985; Vittetoe & Hooker, 1983; Walt, 1985). The thrust for accountability is especially true within the Health Occupations/Allied Health area which has been engaged in the extensive effort to meet current and future manpower needs of the health care delivery system (Milliken, 1982; Wesbury, 1983). Miller, Beckham, and Pathak (1983) expressed this concern as follows:

The number of dollars allocated, programs initiated, and students enrolled for allied health professions education within the university setting has steadily increased over the past 30 years. Because of the perceived need for allied health professions, society in the past has been willing to provide support, without question, for their training. The health education scene in the last few

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years, however, has been influenced by spiraling inflation and its corollaries, including a push **toward** cost containment and progressive reduction in funding. Simultaneously, the public's realization of the lack of quality control and accountability in the **health** care fields has led to the need for internal and external examinations and review of health education institutions' missions, goals, role, and **performance** (p. 12).

Efforts to address the thrusts for accountability have led to a **number** of approaches. One such approach has been the application of knowledge concerning student learning preferences and/or styles. While the awareness of student differences in learning is not new to the educational arena, the increased interest in applying the concept is new (**Claxton, Adams, & Williams, 1982; Knaak, 1983; & Milliken, 1982**).

Application of learning preference and learning style knowledge to curricular design, instructional processes, and counseling and advisement is possible. However, relatively little research has been done to identify preferences of students enrolled in various educational programs for the health occupations (**Vittetoe & Hooker, 1983**). The research of **Myers** (1962) and **McCaulley** (1978) focused on health practitioners and **revealed** that significant differences existed between specialists and generalists within the medical field and some of the associated areas of Allied Health. Few studies have focused on students and their preferences among the various health occupations education (**HOE**)/allied health programs (Payton, **Hueter, McDonald & Hirt, 1980; Ragle & Ross, 1982; Rezler & French, 1975**). The author could not find any references indicating that student preferences differ among the various educational settings.

The purpose of this study **was** to investigate factors proposed to be associated with information and decision-making preferences of students enrolled in different health occupations education (HOE) programs and settings. There were two objectives:

1. To investigate information and decision-making preferences of students enrolled in selected HOE programs. (This objective is expressed later in hypotheses 1-8.)

2. To determine information and decision-making preferences among students who enroll in health occupations programs within the various educational settings of hospitals, junior or community colleges, **vocational/technical** institutions, and four year colleges or universities. (This objective is expressed **later** in hypotheses 9-10).

Definitions

For research purposes the following definitions guided the study:

1. Student was defined as an individual enrolled in the first year of professional studies leading **to** one of the **health** occupations titles. Students enrolled in pre-professional course work and students enrolled in course work beyond the **first** year of the professional curriculum were not included.

2. Preferences reflect the constructs of Carl Jung's theoretical framework which defines four basic mental processes (Sensing, Intuition, Thinking, and Feeling) and the attitudes of Extroversion/Introversion and Judgment/Perception (**Jung**, 1923).

3. Health occupations education programs are defined generically, according to **Milliken** (1982) as "... all educational programs which prepare personnel for practice within the health industry," and "health-related professions which do not fall within the domains of

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medicine, nursing, or dentistry..." (p. 1). Similarly, in 1984 the American Society of Allied **Health** Professionals (**ASAHP**) re-defined allied health personnel more adequately to reflect the growing field of allied health/health occupations in the following manner:

... The term 'allied **health** professional' means an individual trained at the associate, baccalaureate, masters, or doctoral degree level in health care related science, with responsibility for the delivery of health care or health care related services (including services related to the identification, evaluation, and prevention of diseases and disorders, dietary and nutrition services, health promotion, rehabilitation, and health systems management), but who are not graduates of schools of medicine, optometry, podiatry, or nursing (p. 1). Health occupations education programs related to the following 15 selected **health** occupations professions as having met the criteria of the definitions attributed to **Milliken** and **ASAHP**: (a) Dental Assisting, (b) Dental Hygiene, (c) Medical Assisting, (d) Medical Laboratory Technician, (e) Medical Records, (f) Medical Technology, (g) Occupational Therapy, (h) Physical Therapy Assisting, (i) Physical Therapy, (j) Radiography, (k) Radiography Technician, (l) Radiological Technician, (m) Respiratory Therapy, (n) Respiratory Therapy Technician, and (o) Surgical Technician.

4. The educational setting was defined as one of three major institutional settings within which the majority of health occupations education programs are located. **As** is characteristic of the national profile, **95.8%** of all **programs** are located in three types of major institutions: (a) hospitals, (b) junior colleges, community colleges, and vocational-technical institutions, and (c) senior colleges,

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 universities, and medical or dental schools (Department of Allied Health
 Education and Accreditation, 1985).

Conceptual/Theoretical Framework

Drucker (1981), an observer of educational practices in American higher education, has predicted that basic changes in teaching will occur in the near future. These changes will come about **not** so much as a result of the responsiveness of the institutions, which are notoriously resistant to change, but, as **the** result of increasing pressures exerted by the persons being served. **Claxton**, et al. (1982) assert that, as the general public becomes aware that research documents the efficacy of mastery learning and individual learning styles, increasing pressures **will** be exerted on institutions to incorporate both concepts.

Student learning styles and teaching styles have been a focus of research and writing in recent years (**Dunn**, K. & **Dunn**, R., 1978; **Kolb**, 1984; **Lawrence**, 1984; & **Myers**, 1980). **However**, **Cross** (1976) in Accent on Learning stated, ". . . not one teacher or counselor in a hundred knows anything **at** all about cognitive styles despite the fact that research on cognitive styles has been going on for some twenty-five years" (p. 112).

Both of the terms cognitive style and learning style denote preferences for people moving toward educational goals or destinations, i.e., for gaining information or skills, **and/or** deciding or judging. The term learning style, though similar to cognitive style, generally has a more **specific** denotation. For example, as defined by **Claxton** and **Ralston** (1978), learning style is "... the student's consistent way of responding and using stimuli in the context of learning" (p. 1). It also has been defined as "... a personally preferred way **of** dealing with information

and experience for learning that crosses content areas" (Della-Dora & Gable, Postsecondary Health Occupations Students: Info Processing Blanchard, 1979, p. 22).

An early contributor to the concepts of cognitive style and learning style was Carl Jung. Although Jung did not conduct research specifically focused on cognitive style and has not been cited in literature pertaining to cognitive style, his work has provided a prototype or model of style division. Jung (1923) identified the functions of perception (sensing and intuition), and judgment (thinking and feeling), and of attitude preferences (extraversion and introversion). This functional scheme has been incorporated into some of the more recent works of Gregoric (1977), Kolb (1984), McCarthy (1981), and Myers (1980).

Certain predictions can be made regarding student enrollment in educational programs and specifically within health occupations programs (McCaulley, 1978; Ragle & Ross, 1982; Rovezzi-Carroll, 1982; Vittetoe & Hooker, 1983). Boyles, Morgan, and McCaulley (1981) have reported that Introverts tend to be found in greater numbers as educational levels increase. However, little research has focused on differences among students' preferences in various educational settings.

Inferences have been reported concerning effects of preferences for work situations and educational situations, such as, the predictable differences in learning styles and student responses to teaching methods (Myers, 1980). However, Weidman (1984), and Astin, et al. (1980) have suggested there are multiple reasons for student selection of an educational institution or setting.

The preceding review of theoretical support for this study provides the background against which hypotheses were posed (Gable, 1986). Ten hypotheses, reflecting the two objectives, are as follows:

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1. Means of scores for students enrolled in programs such as Radiological Technician, Respiratory Therapy, Occupational Therapy, Dental Assisting, Medical Assisting, or Surgical Technician will be indicative of Extraversion on the Extroversion/Introversion **scale**.
2. Means of scores for students enrolled in programs such as Medical Technology, Physical Therapy, Dental Hygiene, Medical Records, or Medical Laboratory Technician **will be** indicative of Introversion on the Extraversion/Introversion **scale**.
3. Means of scores for students enrolled in programs such as Dental Assisting, **Dental** Hygiene, Radiographer, Radiological Technician, Medical Laboratory Technician, Medical Technology, Physical Therapy, Physical Therapy Assisting, Medical Assisting, or Surgical Technician will be indicative of Sensing on the **Sensing/Intuition** scale.
4. Means of scores for students enrolled in programs such as Occupational Therapy, Medical Records, Respiratory Therapy, or Respiratory Therapy Technician will be indicative of Intuition on the Sensing/Intuition **scale**.
5. Means of scores for students enrolled in programs such as Respiratory Therapy, Respiratory Therapy Technician, Medical Laboratory Technician, Medical Records, Radiographer, Radiological Technician, or Surgical Technician **will** be indicative of Thinking on the Thinking/Feeling **scale**.
6. Means of scores for students enrolled in programs such as Dental Assisting, Dental Hygiene, Medical Assisting, Occupational Therapy, Physical **Therapy**, or Physical Therapy Assisting will be indicative of Feeling on the Thinking/Feeling **scale**.
7. Means of scores for students enrolled in programs such as **Medical** Records, Dental Assisting, Dental Hygiene, Radiological

Technician, Medical Technology, Physical Therapy and Physical Therapy Assistant, or Surgical Technician will be indicative of Judging on the Judging/Perception scale.

8. Means of scores for students enrolled in programs **such** as Occupational Therapy, Respiratory Therapy, and Respiratory Therapy Technician will be indicative of Perception on the Judging/Perception scale.

9. **Means** of scores for students enrolled in programs within four year college **and** university settings will be indicative of Introversion.

10. Means of scores for students enrolled in programs within hospitals, junior colleges, community colleges, or **vocational/technical** educational settings for their health occupational programs will be indicative of Sensing.

Research Methodology

Population

A stratified cluster sample technique (Borg & Gall, 1983; **Hinkle, Wiersma & Jurs**, 1979) was used. The sample, as shown in Tables 1 and 2, consisted of 1187 (82%) students enrolled in **88 (92%) postsecondary** educational programs for the **15** selected health occupations and the three types of educational settings in the state of Indiana. All students who were actively enrolled in the first year of their Health Occupations Education (HOE) program were invited to participate in the study if their program director had expressed cooperation. .

Program directors **and/or** administrators were contacted to communicate the purpose of the study and to request cooperation. All but 8 of the 96 contacted program directors agreed to participate.

Table 1.

Distribution of Student Enrollment Within Selected Health Occupations
Education ProPrams.

Occupation	N	Enrollment %
Dental Assisting	99	8
Dental Hygiene	88	7
Medical Assisting	183	15
Medical Laboratory Technician	114	10
Medical Records	53	4
Medical Technology	153	13
Occupational Therapy	42	4
Physical Therapy	70	6
Physical Therapy Assistant	27	2
Radiological Technician	83	7
Radiographer	92	8
Radiography Technician	7	1
Respiratory Therapy	72	6
Respiratory Therapy Technician	72	6
Surgical Technician	33	3
Totals	1188	100

Table 6: Postsecondary Health Occupations Students': Info Processing

Distribution of Health Occupations Education Programs and Students in Institutional Settings

Setting	Programs		Students	
	N	%	N	z
Hospital	27	31	188	16
Jr/Community College, Voc-Tech Institution	26	29	450	38
Four Year College/Univ	35	40	549	46
Totals	88	100	1187	100

Instrumentation

The data collection instrument was a written questionnaire. The instrument was a modification of the 126 item Myers-Briggs Type Indicator (MBTI), Form G. The reliability of the MBTI, when the Cronbach Alpha technique was used, ranged from .71 - .84 (McCaulley, 1980). The substitution of 16 forced-choice items regarding HOE programs, educational settings, and biographical information for some of the Form G biographical information did not change the intent of the original instrument.

Scoring of the MBTI results in preference scores was conducted for each of four dichotomous scales reflecting Jungian theory: (a) Extraversion/Introversion, (b) Sensing/Intuition, (c) Thinking/Feeling, and (d) Judging/Perception. Extraversion and Introversion represent orientation or attitudes towards the world of life. Persons with Extraversion preferences tend to have their main involvement with

the outer world of people and things. Conversely, people with preferences for Introversion tend to be interested in the inner world of ideas and concerns. Individuals who access information directly by one of the five senses are identified as preferring Sensing while those who prefer to gain information indirectly via the unconscious mind by association or incorporation of ideas are said to prefer Intuition. Decision-making preferences are indicated **by** either a logical and objective process (Thinking) or a personal and subjective approach (Feeling). The preference for Judging or Perception functions is indicated by the fourth scale and is reflected in the degree of structure, flexibility, and closure people seek in their lives. Differences **in** the preferences have been shown to result in corresponding differences in behavior (Myers, 1980).

Statistical Analysis

A total of 1188 responses were returned of which 1187 or **99.9%** were usable. Each response sheet was scored twice and each score was tabulated twice independently. Procedural **verification** of the transfer of data to computer-ready format assured accuracy. Each step of scoring, tabulation, and computer input processing was double-checked and cross-checked. The Statistical Package for the Social Sciences (**SPSS**) Release 9 on the CDC **Cyber** 170/855 computer at Indiana University provided t-test results reported in Tables 3-6.

Variables were based on biographical information--age (64% being 22 years or younger; **90%** being 34 years or younger), gender (**88%** females; 12% males), race (93% White; **2%** Black; **2%** Other), education of mother 48% had high school diploma; 32% had some college **and/or** degree) and of father (**41%** had high school diploma; **32%** had some **college and/or** college

Table 3 **Gable: Postsecondary Health Occupations Students': Info Processing**

Calculation of t-scores for Extraversion/Introversion Continuous Scores of Students in Selected Health Occupations.

Health Occupation	Sample Mean (X)	(X-100.0)	t-score
Dental Hygiene	91.4	-8.61	-12.05***
Medical Assisting	98.3	-1.72	- 2.41*
Medical Lab. Technician	103.5	3.51	4.91***
Medical Records	101.7	1.72	2.40*
Medical Technology	101.8	1.80	2.51*
Occupational Therapy	95.4	-4.57	-6.39***
Physical Therapy	99.8	-0.20	-0.28
Physical Therapy Assisting	95.1	-4.85	-6.79***
Radiological Technician	93.8	-6.16	-8.61***
Radiographer	93.3	-6.74	-9.43***
Radiography Technician	104.3	4.33	6.06***
Respiratory Therapy	97.1	-2.86	-4.00***
Resp. Ther. Technician	94.9	-5.11	-7.15***
Surgical Technician	101.3	1.30	1.82

Note: Number of cases involved is **1188** Each hypothesized mean is 100.0.
Standard Error for Extraversion/Introversion continuous scores is 0.715.

Only six students are in the Radiography Technician category.
Critical values for 14 degrees of freedom:

* $p < .05$ = 2.145

** $p < .01$ = 2.977

*** $p < .001$ = 4.140

Table 4

Calculation of t-scores for Sensing/Intuition Continuous Scores of Students in Selected Health Occupations

Health Occupation	Sample Mean (X)	(X-100.0)	t-score
Dental Assisting	87.4	-12.58	-18.04***
Dental Hygiene	80.4	-19.57	-29.07***
Medical Assisting	85.3	-14.68	-21.07***
Medical Lab. Technician	93.3	-6.67	-9.57***
Medical Records	86.6	-13.42	-19.25***
Medical Technology	95.1	-4.93	-7.08***
Occupational Therapy	98.5	-1.52	-2.19*
Physical Therapy	88.6	-11.43	-16.40***
Physical Therapy Assisting	81.6	-18.41	-26.41***
Radiological Technician	91.3	-8.69	-12.46***
Radiographer	89.2	-10.78	-15.47***
Radiography Technician	83.0	-17.00	-24.39***
Respiratory Therapy	95.4	-4.58	-6.58***
Resp. Therapy Technician	92.5	-7.47	-10.72***
Surgical Technician	82.88	-17.12	-24.56***

Note: Number of cases involved is 1188. Each hypothesized mean is 100.0.

Standard Error for Sensing/Intuition continuous scores is 0.697.
Only six students were in the Radiography Technician category.
Critical values for 14 degrees of freedom:

* $p < .05 = 2.145$

** $p < .01 = 2.977$

*** $p < .001 = 4.140$

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Table 5

Calculation of t-scores for Thinking/Feeling Continuous Scores of Students in Selected Health Occupations.

Health Occupation	Sample Mean (X)	(X-100.0)	t-score
Dental Assisting	113.7	13.73	23.35***
Dental Hygiene	110.8	10.77	18.32***
Medical Assisting	107.4	7.42	12.61***
Medical Lab. Technician	100.3	0.26	0.45
Medical Records	102.7	2.70	4.59***
Medical Technology	102.5	2.52	***
Occupational Therapy	114.2	14.24	24.21***
Physical Therapy	109.5	9.51	16.18***
Physical Therapy Assisting	110.6	10.56	17.95***
Radiological Technician	101.5	1.51	2.56*
Radiographer	104.3	4.26	7.25***
Radiography Technician	105.3	5.33	9.07***
Respiratory Therapy	101.4	1.42	2.41*
Resp. Therapy Technician	104.3	4.31	7.32***
Surgical Technician	105.9	5.97	10.15***

Note: Number of cases involved is 1188. Each hypothesized mean is 100.0.

Standard Error of Thinking/Feeling continuous scores is 0.588.
Only six students were in the Radiography Technician category.

* $p < .05 = 2.145$

** $p < .01 = 2.977$

*** $p < .001 = 4.140$

Table 6

Calculation of t-scores for Judgment/Perception Continuous Scores of
Students in Selected Health Occupations.

Health Occupation	Sample Mean (X)	(X-100.0)	t-score
Dental Assisting	95.3	- 4.66	- 6.16***
Dental Hygiene	89.2	-10.84	-14.34***
Medical Assisting	96.2	- 3.82	- 5.05***
Medical Lab. Technician	96.7	- 3.30	- 4.36***
Medical Records	88.7	-11.30	-14.95***
Medical Technology	91.8	- 8.20	-10.85***
Occupational Therapy	99.7	- 0.29	- 0.38
Physical Therapy	91.9	- 8.03	-10.62***
Physical Therapy Assistant	93.1	- 6.85	- 9.06***
Radiological Technician	99.3	- 0.66	- 0.88
Radiographer	97.0	- 2.93	- 3.88**
Radiography Technician	83.7	-16.33	-21.60***
Respiratory Therapy	101.8	1.78	2.35*
Resp. Therapy Technician	96.1	- 3.94	- 5.22***
Surgical Technician	90.5	- 9.55	-12.63***

Note: Number of cases is 1188. Each hypothesized mean is 100.0.
Standard Error of Judging/Perception is 0.756.
Only six students were in the Radiography Technician category.
Critical values for 14 degrees of freedom:

*p < .05 = 2.145
**p < .01 = 2.977
***p < .001 = 4.140

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degree), highest grade completed (29% reported 12th grade; 85% reported Junior in college or less), high school GPA (63% reported 3.1 or above; 88% reported 2.6 or above), and reasons for selecting the educational site (proximity to home, 76%; family influence, 46%; availability of HOE program, 92%; opportunity to work while a student, 51%; cost, 70%; availability of financial aid, 41%), occupational group, educational setting and preference type, and continuous scores as defined by McCaulley (1980). Measures were based on the self-reported responses of the participants.

Research Findings and Discussion

The major findings were divided into two categories: (a) identification of preferences for processing information and decision-making of students enrolled in different health occupations programs and (b) identification of preferences for processing and decision-making of students enrolled in different educational settings.

Category 1 - Different Health Occupations

The first category is related to the identification of information and decision-making preferences of students enrolled in different health occupations programs. Mean scores for students enrolled in all HOE programs did not differ from respective normed means as tested with Students t ($p < .05$) except for Physical Therapy on Extroversion/Introversion, Medical Laboratory Technician on **Thinking/Feeling** and Occupational Therapy and Radiographer on the Judging/Perception scale. Specific health occupations, e.g., Radiological Technician, Respiratory Therapy, Occupational Therapy, Physical Therapy, Dental Hygiene, and Dental Assisting had group means indicating a preference for

Extraversion. Medical Records, Medical Technology, and Medical Laboratory Technician had group means indicating a preference for Introversion (Table 3). The finding of a group mean indicative of Extraversion for both Dental Hygiene and Physical Therapy was somewhat surprising and counter to the hypothesis stated. Because of job tasks and the typical one-to-one relationship of practitioner and patient, it had been hypothesized that both groups would have a preference for Introversion.

All health occupations majors had group means reflective of preferences for Sensing. All **t-scores** were significant at $p < .001$ except Occupational Therapy which had a group mean for Sensing which was less strong and a **t-score** which was significant at $p < .05$ as shown in Table 4.

All occupational groupings had scores indicative of preferences Feeling with a differentiation of the group means as presented in Table 5. The Medical Laboratory Technician category had the weakest preference for Feeling while the Occupational Therapy group had the strongest.

Only the Respiratory Therapy group had a mean indicative of a preference for Perception. The Occupational Therapy and Radiological Technician categories had means indicating a very weak non-significant preference for Judging. The other groups had means differentiated on the Judging side of the scale with Radiography Technician having the strongest preference as can be seen in Table 6.

Category 2 - Different Educational Settings

The second category of findings is related to the identification of preferences for processing information and decision-making of students enrolled in different educational settings. Educational setting was significant at the $p < .001$ level for the Sensing/Intuition scale. Specifically, students preferring Introversion were not found to be

located in four-year college/university settings, significantly more than the other settings as prior research indicated. Students preferring Sensing were found to be enrolled in Hospitals, Vocational-Technical institutions, junior and community colleges.

Recommendations

The following four recommendations are based on the findings of this study and the practical importance to administrators and faculty of health occupation programs in **postsecondary** institutions:

1. Because students enrolled within the selected health occupations have been found to be different in their preferences on all four scales of **the MBTI**, administrators and faculty need to be aware that interdisciplinary courses may be advantageous for some groups of students. **Faculty should** be encouraged to use a variety of instructional strategies **which could** facilitate learning for all health occupations groups.

2. While the health occupations groups may be differentiated on the preference scales, individual students in a given program are different in fundamental ways as well. Some individual allowance for variation in instructional methods and strategies could facilitate the learning of more students. Attempts to teach **all** students by using single instructional modes are inappropriate and do not promote the learning process. Administrators could increase the effectiveness of educational programs by urging faculty members to consider individual student preferences when implementing instructional plans to facilitate student learning,

3. Because students differ, administrators should encourage self-awareness of preferences of faculty members. Awareness and recognition of their own preferences could enable faculty members to better understand their participation in the interactive process of learning.

4. Program directors and administrators should recognize the differentiation by educational setting of student preferences for Sensing/Intuition. The hospital, junior college, community college, and vocational-technical institutional settings appear to attract students who prefer details, consistency in procedures and skills in the psychomotor realm. Consequently, instructional methods and counseling processes **should** reflect the recognition of these preferences.

These recommendations are made in an effort to identify potential ways to increase the effectiveness and efficiency of 'health occupations or allied health educational programs. Application of the suggestions could **enable** administrators and faculty members to respond to concerns for quality and cost-effectiveness of their educational programs. It should be recognized that these recommendations may **not** be applicable to HOE programs or sponsoring educational institutions **in** general. The **sample** used in this study was restricted to the fifteen selected health occupations having the largest student enrollments, **the** three settings representing the largest percentage of health occupations education programs and to the geographical boundaries of one state. **The sample** did not represent the numerous health occupations with lower enrollments, the settings of proprietary schools, consortia, secondary schools, or governmental institutions including the military or corrections, nor the nation generally.

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