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AUTHOR Mentkowski, Marcia; Doherty, Austin
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ABSTRACT

The Six Performance Characteristics rating, An Alverno College assessment technique used in the outcome-centered liberal arts curriculum, is discussed. The technique provides a means for faculty to judge students in a systematic way over time on developmental characteristics that apply to their performance across disciplines and across competence areas. The six characteristics were integration, independence, creativity, self-awareness, commitment, and habituality. Ratings on the performance characteristics were conducted on all classes during 1979-1982 as part of a program validation. Based on a longitudinal study sample of two consecutive entering classes, a single factor was found to account for 90 percent of the variance in ratings on each characteristic on three occasions. Using the single factor, it was found that students were rated at significantly higher levels over time, corroborating the cross-sectional evidence for the developmental character of the procedure. Relationships between the Six Performance Characteristics factor and the measures of human potential revealed that the faculty were making judgments based on a general dimension associated with several external criterion measures of intellectual, ego, and moral development. (Author/SW)

# VALIDATING ASSESSMENT TECHNIQUES IN AN OUTCOME-CENTERED LIBERAL ARTS CURRICULUM: SIX PERFORMANCE CHARACTERISTICS RATING

Assessment Committee/Office of Research & Evaluation
ALVERNO COLLEGE

## FINAL REPORT TO THE NATIONAL INSTITUTE OF EDUCATION: RESEARCH REPORT NUMBER FIVE



Funded by a grant from the National Institute of Education:
Careering After College: Establishing the Validity of Abilities Learned in College for Later Success
(NIE-G-77-0058)

Principal Investigators:
Marcia Mentkowski
Austin Doherty
Alverno College
3401 South 39th Street
Milwaukee, Wisconsin 53215

An overview and rationale for our approach to the study of college outcomes, and a summary of the results from the following series of ten research reports, are found in:

Marcia Mentkowski and Austin [illegible]ty. Careering After College: Estab[illegible]he Validity of Abilities Learned in College for La[illegible] Careering and Professional Performance. Final Report to the National Institute of Education: Overview and Summary. Milwaukee, WI: Alverno Productions, 1983.

Research Reports:

One: Friedman, M., Mentkowski, M., Earley, M., Loacker, G., & Diez, M. Validating Assessment Techniques in an Outcome-Centered Liberal Arts Curriculum: Valuing and Communications Generic Instrument, 1980.

Two: Friedman, M., Mentkowski, M., Deutsch, B., Shovar, M.N., & Allen, Z. Validating Assessment Techniques in an Outcome-Centered Liberal Arts Curriculum: Social Interaction Generic Instrument, 1982.

Three: Assessment Committee/Office of Research and Evaluation. Validating Assessment Techniques in an Outcome-Centered Liberal Arts Curriculum: Insights From the Evaluation and Revision Process, 1980.

Four: Assessment Committee/Office of [illegible] and Evaluation. Validating Assessment Techniques in an Outcome-Ce[illegible]eral Arts Curriculum: Integrated Competence Seminar, 1982.

Five: Assessment Committee/Office of Research and Evaluation. Validating Assessment Techniques in an Outcome-Centered Liberal Arts Curriculum: Six Performance Characteristics Rating, 1983.

Six: Mentkowski, M., & Strait, M. A Longitudinal Study of Student Change in Cognitive Development and Generic Abilities in an Outcome-Centered Liberal Arts Curriculum, 1983.

Seven: Much, N., & Mentkowski, M. Student Perspectives on Liberal Learning at Alverno College: Justifying Learning as Relevant to Performance in Personal and Professional Roles, 1982.

Eight: Mentkowski, M., Much, N., & Giencke-Holl, L. Careering After College: Perspectives on Lifelong Learning and Career Development, 1983.

Nine: Mentkowski, M., DeBack, V., Bishop, J., Allen, Z., & Blanton, B. Developing a Professional Competence Model for Nursing Education, 1980.

Ten: Mentkowski, M., O'Brien, K., McEachern, W., & Fowler, D. Developing a Professional Competence Model for Management Education, 1982.

ABSTRACT

The Six Performance Characteristics assessment technique provides a means for faculty to judge students in a systematic way over time on developmental characteristics which apply to their performance across disciplines and across competence areas identified as goals of liberal learning by Alverno faculty. Descriptions of six performance characteristics were prepared and first tested by faculty on seniors graduating in the spring of 1978. The characteristics were integration, independence, creativity, self-awareness, commitment, and habituality. The characteristics were defined by sets of descriptors for the "Beginning Student," the "Developing Student," and the "Graduating Student." Pilot study results indicated some discriminating power (students graduating with honors were rated significantly higher than students graduating without honors). The following year all students in the college were rated to collect additional information on inter-rater reliability, the developmental character of the ratings, and the extent to which the six characteristics were differentiated in ratings.

Results from the first all-college administration provided evidence of acceptable inter-rater reliability, and supported the developmental character of the definitions through significant mean differences between classes. While the power of the technique to distinguish between students at different levels was demonstrated, it was found that all characteristics followed nearly identical patterns, raising further questions concerning the differentiation between them.

Performance Characteristics ratings were conducted on all classes in 1979, 1980, 1981 and 1982, as part of a comprehensive program validation which included other measures of student performance within the curriculum, and longitudinal assessments of student development and change using a battery of external criterion measures (Mentkowski & Strait, 1983). It was confirmed with ratings from the longitudinal study sample of two consecutive entering classes that a single factor accounted for 90% of the variance in ratings on each characteristic on three different occasions. Using the single factor, it was found that students were rated at significantly higher levels over time, corroborating the cross-sectional evidence for the developmental character of the procedure. The rating factor was not associated with other college performance measures in the longitudinal study when the influences of student background and program differences were controlled. There was however evidence that ratings discriminated between students on academic probation and those who were not, irrespective of class standing.

Relationships between the Six Performance Characteristics factor and the measures of human potential revealed that the faculty were making judgments based on a general dimension associated with several external criterion measures of intellectual, ego, and moral development. The strongest pattern of associations was found with a measure of Perry's scheme of intellectual and ethical development during the college years (Perry, 1970, 1981). The Alverno faculty is continuing to work with the assessment technique, attempting to refine the definitions of several characteristics so that a more differentiated picture of student development may result.

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Austin Doherty
Margaret Earley
Miriam Friedman
George Gurria
Pat Jensen
Joan Koehler
Cathleen Krzyminski
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Georgine Loacker
William McEachern
Marcia Mentkowski
Agnes Meysenburg
Marlene Neises
James Newton
Kathleen O'Brien
James Roth
Jean Schafer
Judeen Schulte
Judith Stanley
Kyle Stewart
Michael Strait
Alice Theine
Christine Trimberger
Allen Wutzdorff

Alverno College Faculty

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# VALIDATING ASSESSMENT TECHNIQUES IN AN OUTCOME-CENTERED LIBERAL ARTS CURRICULUM: SIX PERFORMANCE CHARACTERISTICS RATING

Assessment Committee/Office of Research and Evaluation
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## The Six Performance Characteristics Rating: A Faculty Rating of Student Performance Characteristics

The Six Performance Characteristics rating, an Alverno College assessment technique, provides a means for faculty to assess students at regular intervals on several characteristics which apply to her performance across disciplines and across competences identified as central objectives of liberal learning at Alverno College. The rationale, descriptions of Six Performance Characteristics, and an initial rating instrument were developed by the Assessment Committee and the Office of Research and Evaluation in the 1977-78 academic year.

The six characteristics identified by Alverno faculty are integration, independence, creativity, self-awareness, commitment, and habituality. The last, habituality, was conceived as modifying the other five. Original descriptions of the Six Characteristics are included in Appendix A. At the outset, the characteristics were developed to serve a particular need for criteria used in judging advanced students in the performance of complex and interrelated abilities required in their major areas of concentration. They were to function as general criteria in assessing student endeavor at advanced levels. After an initial rating of graduating seniors in the spring of 1978, it decided to expand the rat[illegible] effort to al[illegible]sses of st[illegible]ents in the Weekday College, to help further understand the developmental nature of the characteristics. An Assessment Committee report on the pilot rating study is presented in Appendix B.

This paper briefly describes the development, use, and analyses of the assessment technique from its first employment in the spring of 1978, through its college wide implementation in the 1979, 1980, and 1981 spring semesters. The external validation of the assessment technique is reported in terms of the relationships between the Six Performance Characteristics rating (SPC), other indices of college performance available from student records or being developed by the faculty, and external criterion measures of human potential administered during this period as part of an overall evaluation/validation of Alverno's curriculum (Mentkowski & Doherty, 1977, 1983; Mentkowski; 1980; Mentkowski & Strait, 1983).

Several strategies for validating outcomes and new assessment techniques were developed into a comprehensive validation model. The model incorporates various research and evaluation methods,

with the ultimate goals of establishing program validity, contributing to program development, and developing a picture of adult learning and development that can be used to improve instruction and assessment in liberal education settings. Figure 1 displays the several components of the validation model.

The results reported in this paper link faculty ratings on the Six Performance Characteristics to other internal college performance indices (e.g., credit hours and competence level units), to another new Alverno assessment technique, the Integrated Competence Seminar, and to external criterion measures of human potential. Other papers present results linking the human potential measures to the Integrated Competence Seminar (Assessment Committee/Office of Research and Evaluation, 1982) and to the performance indices (Mentkowski & Strait, 1983).

## The Rating Instrument and the Procedure

An example of the revised rating form is presented in Appendix C. A nine point scale was used for rating each characteristic. The descriptions of the characteristics developed by the Assessment Committee included descriptors identifying the "Beginning Student," the "Developing Student," and the "Graduating Student." The instructions on the rating form ask the faculty member to rate each student using the entire nine point scale, irrespective of the student's class standing. The form included a space for comments. A scale for Habituality was included for each of the five other characteristics. An Habituality rating was given only in those cases where the other characteristic was rated a four or above, on the principle that a lower rating precluded the possibility of habituation being evident. Each of the five characteristics was rated on a separate page.

As indicated above, the first use of the instrument in Spring 1978 involved rating only graduating Seniors. In that administration, two faculty from a student's major area rated each student and then arrived at a consensus rating. Only consensus ratings were collected and analyzed. It was from a review of those initial results that the form and procedure described here were drawn.

The procedure was revised so that, for Juniors and Seniors, two faculty from the student's major area, and one from her minor area, would be making a rating, for the purposes of collecting inter-rater reliability data. Freshmen and Sophomores were rated by at least two of their instructors, but these individual ratings were averaged rather than subjected to a consensus process. Specific procedures are outlined in Appendix D.

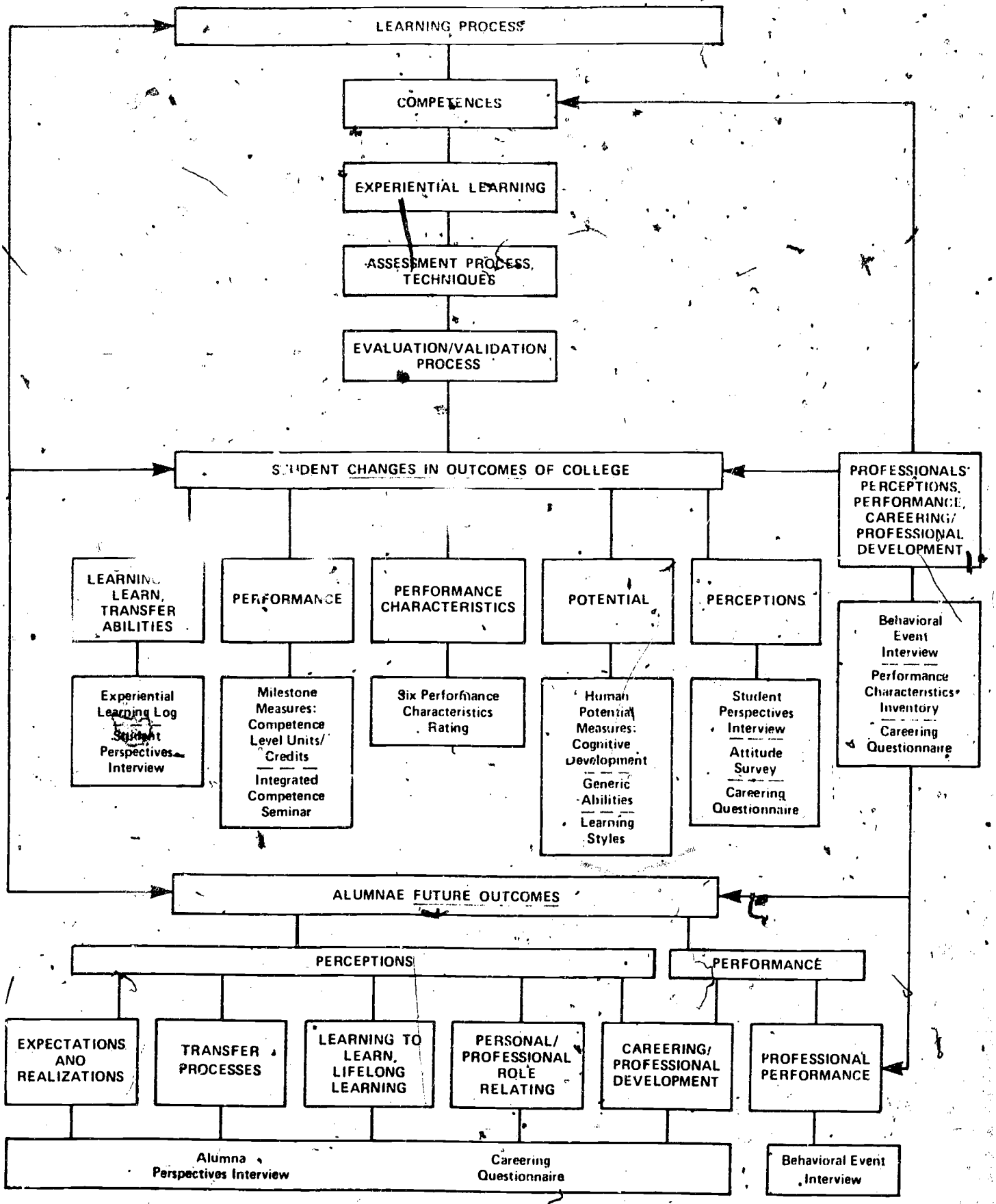


Figure 1. Components of a validation model for the Alverno learning process with external validation instruments.

## Results From the First College-wide Faculty Rating

The Spring, 1979 data collection was designed to yield improved information with respect to the following issues:

1) Practicality and utility of a college-wide rating
2) Inter-rater reliability
3) The extent to which the Six Performance Characteristics are developmental
4) Are the definitions differentiating among the characteristics? To what extent are they inter-related?

### Implementation

The Spring 1979 rating of Weekday College students included all students enrolled. The descriptive statistics cited below demonstrate the effectiveness of the rating procedure, and the Alverno faculty's ability to collaborate on this college-wide task.

Table 1 indicates that 91% of all the Weekday College students were rated, an extremely high percentage.

Table 1.

Sample Description of Spring, 1979
Six Performance Characteristics Ratings

| | # Enrolled | # Rated | % Rated |
|---|---|---|---|
| Freshman | 216 | 175 | 81% |
| Sophomore | 209 | 203 | 97% |
| Junior | 124 | 117 | 94% |
| Senior | 97 | 95 | 97% |
| | 646 | 591 | 91% |

Table 2 presents the number of instruments on which comments were recorded per class standing. It was assumed that faculty rating Seniors or Juniors were more familiar with the students and would be more able to write comments, as compared to faculty who rated Freshmen and Sophomores. Table 2 shows that similar percentages of comments were obtained across all four class standings. This suggests that comments can be an effective tool for collecting information for a student's file that can be used later for writing narrative transcripts.

Table 2.

Comments by Class Standing

| | # Rated | # Comments | % Comments |
|---|---|---|---|
| Freshman ... | 175 | 109 | 62% |
| Sophomore .. | 204 | 105 | 51% |
| Junior ..... | 117 | 66 | 56% |
| Senior ..... | 95 | 53 | 55% |

The total number of students rated was broken down by discipline divisions to get a better understanding of the intradivisional procedure for pursuing the rating task. Table 3 specifies the number of students who were expected to be rated and the actual number rated (sample total) by division. Overall, most of the divisions were close to the expected totals.

Table 3.

Number of Students Rated by Division

| Division | | Fr. | So. | Jr. Minor | Jr. Major | Sr. Minor | Sr. Major |
|---|---|---|---|---|---|---|---|
| 1) Arts and Humanities | Expected Total | 7 | 12 | 9 | 10 | 8 | 7 |
| | Sample Total | 13 | 17 | 8 | 9 | 9 | 5 |
| 2) Behavioral Sciences | Expected Total | 33 | 20 | 42 | 15 | 33 | 16 |
| | Sample Total | 24 | 24 | 22 | 19 | 28 | 15 |
| 3) Education | Expected Total | 9 | 6 | | 12 | 14 | 13 |
| | Sample Total | 5 | 9 | | 8 | 13 | 13 |
| 4) Math & Natural Sci. | Expected Total | 5 | 12 | 16 | 13 | 16 | 7 |
| | Sample Total | 5 | 14 | 10 | 11 | 19 | 3 |
| 5) Nursing | Expected Total | 131 | 128 | -- | 79 | -- | 57 |
| | Sample Total | 110 | 129 | -- | 71 | -- | 55 |
| 6) Performing Arts | Expected Total | 7 | 11 | 2 | 10 | -- | 10 |
| | Sample Total | 10 | 17 | 1 | 10 | 2 | 10 |
| 7) Undecided | Expected Total | 8 | -- | -- | -- | -- | -- |
| | Sample Total | 8 | -- | -- | -- | -- | -- |

The rated sample obtained is representative not only across class standing but also within divisions. High percentages of minor and major ratings were obtained (as compared to the expected numbers). The present analysis throws light on the extent to which faculty can handle such a college-wide instrument rating.

## Inter-rater Reliability of Six Performance Characteristics Ratings

The question of expert judgment is a major concern in our efforts to validate assessment techniques employed in the college. The Six Performance Characteristics data provided some insight into these questions:

1) What is the extent of agreement between faculty ratings of students when the faculty doing the rating are from the same department? from different departments?

Table 4 indicates the number of students who were rated by faculty from a student's major department within each class standing. Freshmen and Sophomores were rarely rated by faculty within their major department since the criterion for selecting faculty raters for Freshmen and Sophomores was instructors teaching Freshman or Sophomore courses irrespective of the student's major.

Table 4.

Major Department Ratings[1]

| | |
|---|---|
| Freshman | 10 |
| Sophomore | 42 |
| Junior | 97 |
| Senior | 84 |

Note. [1] Faculty raters are members of the student's major department.

For Freshmen and Sophomores the inter-rater reliability data indicated significant correlations between faculty ratings from within the major department as well as between faculty ratings from outside a student's major department. The inter-rater reliability coefficients from outside a student's major department were somewhat lower as an overall pattern. (See Table 5.) Habituality was excluded from these analyses due to the special procedures involved in its application.

Table 5.

Inter-rater Reliability Per Characteristic for Freshman-Sophomore Ratings

| | | Integration | Independence | Creativity | Awareness | Commitment |
|---|---|---|---|---|---|---|
| Faculty Ratings From Within Students' Major Compared (Approx. 51 Students) | r = | .45 | .40 | .52 | .36 | .35 |
| | s = | .001 | .002 | .001 | .004 | .005 |
| Faculty Ratings From Outside Students' Major Compared (Approx. 200 Students) | r = | .40 | .30 | .38 | .38 | .38 |
| | s = | .001 | .001 | .001 | .001 | .001 |

Note. s = significance level

2) To what extent will faculty agree on student's rating when a student is rated in both her major and minor department?

3) To what extent is the consensus rating (two faculty compare individual ratings and come to consensus) consistent with the average rating (two faculty submit individual ratings and they are averaged)?

One of the curriculum pedagogical objectives is to have students function similarly within their major and minor area, thus emphasizing the concepts of transfer and internalization of abilities. The Six Performance Characteristics Rating yielded data which enabled us to compare faculty judgment on major and supporting area and explore the consistency of students' performance in both their major and minor areas.

Table 6 shows that the inter-rater reliability between Juniors' and Seniors' major and minor ratings is significantly consistent. Similar results were obtained with regard to the major department agreement. The highest agreement correlations were obtained when consensus rating was compared to the average rating given by each of two faculty from the student's major department. Such high correlations suggest that the consensus procedure can be eliminated from the rating, since averaging of two ratings from two faculty in the student's major department will provide almost identical results.

Table 6.

Inter-rater Reliability Per Characteristic
For Juniors and Seniors

| | | Integration | Independence | Creativity | Awareness | Commitment |
|---|---|---|---|---|---|---|
| Average "Major" Rating Compared to Average "Minor" Rating (Approx. 110 Students) | r = | .47 | .52 | .52 | .39 | .40 |
| | s = | .001 | .001 | .001 | .001 | .001 |
| Consensus Compared to Average "Major" Rating (Approx. 180 Students) | r = | .94 | .94 | .90 | .92 | .91 |
| | s = | .001 | .001 | .001 | .001 | .001 |

Note. s = significance level.

Are the Six Performance Characteristics Developmental?

This question examines the extent to which faculty's interpretation of the characteristics is consistent with the intended developmental meaning of the definitions. If ratings are found to be developmental, the data should indicate that:

1) Student ratings within each class standing fall along the full scale range from 1 to 9.
2) The majority of students demonstrate a developmental pattern, i.e. the majority of Freshmen will be rated lower than the majority of Sophomores, etc., per characteristic.

Figure 2 represents the distributions of percentages of students as they were rated on the 9-point scale per characteristic.

Each class distribution is presented by a solid line, whereas the mode of each class standing is indicated by a vertical broken line. The five graphs demonstrate a consistent developmental pattern. The modal point for Freshmen on the scale is 2 to 3 (beginning), for Sophomores is 3 to 4 (developing), for Juniors is 4 to 5 (developing), and for Seniors is 7 to 8 (graduating). The graphs also indicate that the whole scale was used for each class standing. Thus, faculty recognized individual differences within each class standing.

The Freshmen, Sophomores and Juniors seem to progress upward in a consistent manner, whereas the Seniors are making a leap and are far ahead on the scale.

Table 7 indicates the mean rating for each class standing per characteristic. A discriminant analysis indicated significant differences vertically (across class standing) but not horizontally (across characteristics). Thus, although the characteristics were proved to be developmental, ratings across the characteristics are similar.

Table 7.

Means and Standard Deviations Per Characteristic Within Each Class Standing

| | Number of Instruments | | Integration | Independence | Creativity | Awareness | Commitment |
|---|---|---|---|---|---|---|---|
| Freshman | 288 | M = | 3.2 | 3.3 | 3.2 | 3.3 | 3.5 |
| | | SD = | 1.5 | 1.6 | 1.6 | 1.6 | 1.7 |
| Sophomore | 406 | M = | 3.9 | 4.1 | 3.9 | 4.1 | 4.1 |
| | | SD = | 1.5 | 1.6 | 1.5 | 1.6 | 1.7 |
| Junior | 191 | M = | 5.3 | 5.4 | 5.2 | 5.3 | 5.8 |
| | | SD = | 1.5 | 1.6 | 1.4 | 1.5 | 1.5 |
| Senior | 167 | M = | 6.6 | 7.1 | 6.7 | 6.7 | 7.2 |
| | | SD = | 1.8 | 1.6 | 1.6 | 1.7 | 1.7 |

Results from the pilot study of ratings for graduating Seniors (see Appendix B) included findings of group differences between majors and between Seniors graduating with or without honors. The findings of class differences corroborate that preliminary evidence for the discriminating power of the rating procedure.

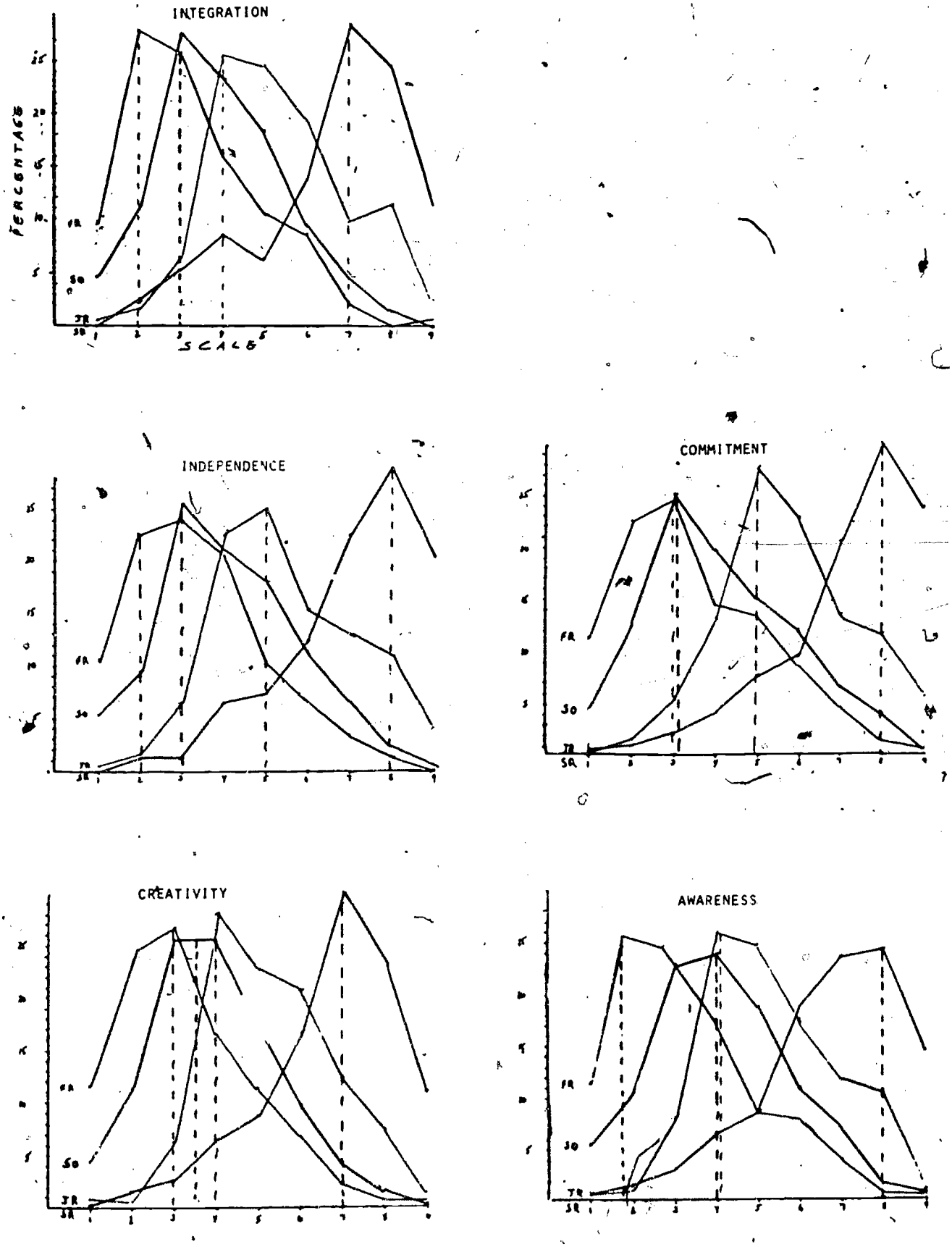


Figure 2. Frequency distributions of Freshmen, Sophomores, Juniors and Seniors rated on the Six Performance Characteristics in Spring, 1979.

## Are the Definitions Differentiating among the Characteristics?

Inter-correlations among the characteristics disregarding class standing indicated that the characteristics are highly interrelated (Table 8).

Table 8.

Table of Intercorrelation for All the Six Performance Characteristic Data Disregarding Class Standing

| | Integration 1 | Independence 2 | Creativity 3 | Awareness 4 | Commitment 5 |
|---|---|---|---|---|---|
| 1 | --- | | | | |
| 2 | .834 | --- | | | |
| 3 | .767 | .775 | --- | | |
| 4 | .815 | .804 | .777 | --- | |
| 5 | .79 | .776 | .712 | .816 | --- |

Figure 3 demonstrates clearly how the class standing distributions across characteristics form almost a straight line, even though there are significant differences between classes.

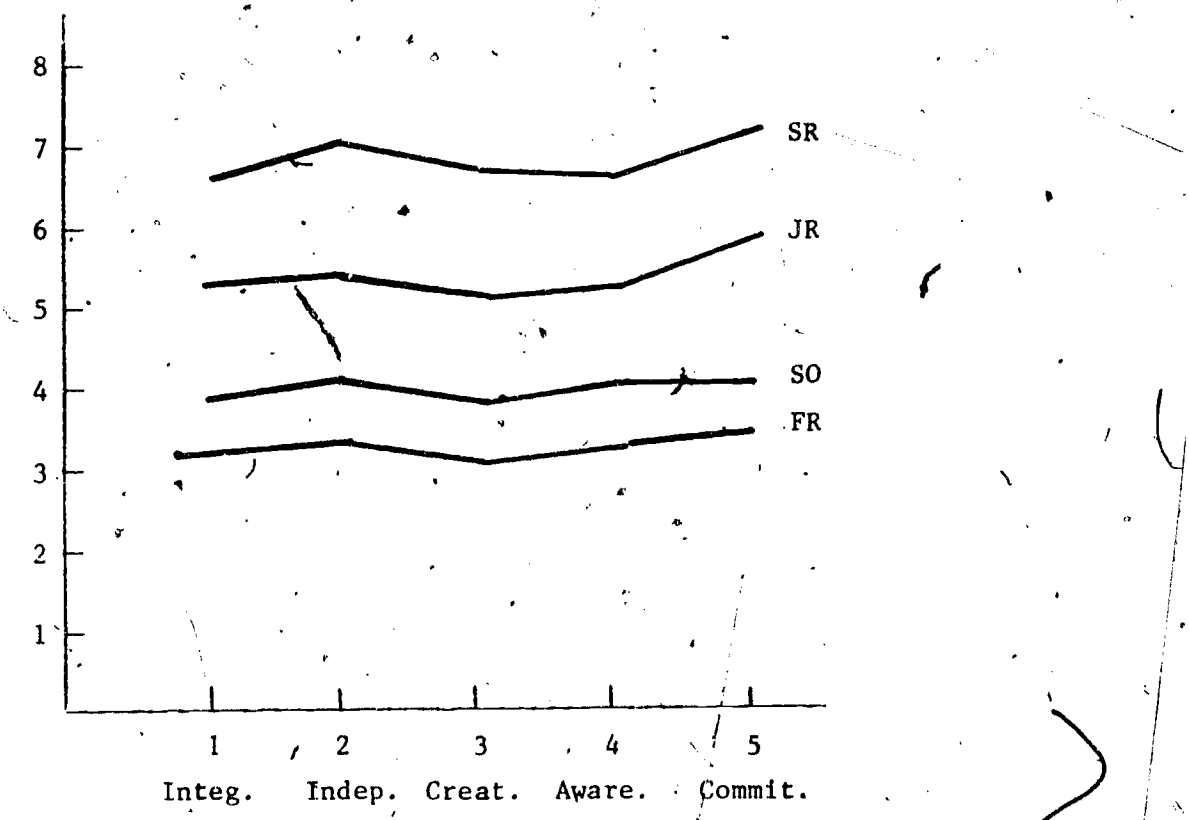


Figure 3. Distribution of ratings across Six Performance Characteristics.

## Faculty Perceptions of the Rating Process

After rating students, faculty completed questionnaires evaluating the rating process. The questionnaire, with quantitative summary data, is presented in Appendix E.

Faculty were asked to indicate which of five kinds of evidence, or sources of judgment, they used in rating, and to rank order the ones they used. The five sources given were observed behavior, performance on assessments, sense of the student, conversation with student, and handbook definitions. Virtually all of the 39 faculty who responded indicated they used all five sources. Observed behavior was ranked first in importance, performance on assessments was second, sense of student and conversation with student tied for third, and the definitions were ranked as least important.

When asked how clear and understandable the handbook definitions were, the faculty gave similar average ratings to each characteristic. On a scale of 1 to 7 with 7 most clear, all mean ratings were at or just below 5. Independence and Commitment were rated as slightly more clear and understandable than Integration, Creativity, Awareness, and Habituality, all of which received the same mean rating.

Faculty who responded generally felt the process would have been more effective if they had had more advance notice of the rating in which to make mental notes on students they would be asked to rate. There was no single precise procedure used by all faculty in reaching consensus, but most indicated they discussed individual ratings first and then chose a single rating or averaged their ratings.

## Validating the Six Performance Characteristics Rating in Relation to Other Student Performance Measures in the Longitudinal Study

Longitudinal data were collected on two consecutive classes entering in 1976 and 1977. The measures of human potential, identified in Table 9, were administered on three occasions: at entrance, two years later, and three and one-half years after entrance. Table 10 shows the temporal relationships among several components of the comprehensive validation model. The first all-college Six Performance Characteristics rating in the spring of 1979 occurred in the same academic year as the second longitudinal assessment of Weekday College students who entered in 1976. Ratings in the following two years, 1980 and 1981, effectively provided two ratings for each longitudinal Weekday College cohort, roughly coinciding with the second and third longitudinal assessments on human potential measures.

Table 9.

Measures of Human Potential From the Longitudinal Study [1]

HUMAN POTENTIAL MEASURES: COGNITIVE DEVELOPMENT

Test of Cognitive Development (Renner et al., 1976; after Piaget)

By having a student work a series of problems and provide reasons for his or her answers, this instrument measures a student's cognitive activity based on Piaget's stages of cognitive development.

Sentence Completion Test (Loevinger, et al., 1970)

This instrument provides a measure of an individual's stage of ego development. "Ego" here is defined as one's "style of life," the unity of personality, individuality, the method of facing problems, opinion about one's self and the problems of life, and the whole attitude toward making choices in all life spheres.

Defining Issues Test (Rest, 1979)

Rest's instrument (based on Kohlberg's theory of moral development) provides a measure of an individual's moral development in a recognition task by analyzing the relative importance attributed by a person to principled moral considerations. A person attributes importance to several reasons given for resolving a particular moral dilemma, and then rank orders them.

Measure of Vocational, Educational, and Personal Issues (Knefelkamp, 1974; Widick, 1975; now titled: Measure of Intellectual Development; after Perry)

This measure of the Perry scheme of intellectual and ethical development asks students to write three essays on their best class, a major decision and their career. It assesses the progress the college student makes toward movement on the Perry scheme.

HUMAN POTENTIAL MEASURES: GENERIC ABILITIES

Test of Thematic Analysis* (Winter, 1976)

This instrument consists of two sets of stories students are asked to compare thematically. This "thematic analysis" is scored according to twelve categories of critical thinking. This test is based on an understanding of cognitive development defined as the ability to analyze new information and to synthesize new concepts based on this information, and reflects the ability to integrate information into one's own cognitive structure. As the cognitive structure grows, so does the ability to think critically, to make a cogent argument and to reason inductively.

Picture Story Exercise* (Scored for Stages of Adaptation (Stewart, 1977), Self-Definition (Stewart & Winter, 1974); and Achievement (McClelland, et al., 1953, Affiliation (Atkinson, 1958), and Power (Winter, 1973) motives.)

This instrument, modeled on the Thematic Apperception Test, may be used to assess a variety of abilities. The instrument requires the student to write narratives to six pictures. One is "self-definition" which encompasses the way one thinks about the world and one's self, the way one reacts to new information, and the way one behaves (Stewart and Winter, 1974). People with high cognitive initiative are not only able to think clearly, but also to reason from problem to solution, and to propose and take effective action on their own. This instrument is also used to assess Need for Achievement (McClelland, et al., 1953), Affiliation (Atkinson, 1958), Power (Winter, 1973), and Stages of Adaptation, a measure of ego development (created by Stewart, 1977).

Watson-Glaser Critical Thinking Appraisal (Watson and Glaser, 1964)

This instrument measures several components of critical thinking: Inference, Recognition of Assumptions, Deduction.

Learning Style Inventory* (Kolb, 1976)

The Learning Style Inventory is a measure of individual learning styles which affect decision-making and problem-solving. The four styles are Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. The instrument requires the student to rank order descriptive statements about her mode of learning.

*Available from McBer and Company.

[1]For a more detailed description of the measures and their use in the longitudinal study, see Mentkowski, M. & Strait, M. A Longitudinal Study of Student Change in Cognitive Development and Generic Abilities in an Outcome-Centered Liberal Arts Curriculum. Milwaukee, Wi: Alverno Productions, 1983.

Table 10.

Design for the Administration of Human Potential Measures and Student Perception Measures for Longitudinal and Cross-Sectional Studies of Student Outcomes

| | Entrance Cohort | Academic Year 1976/77 | 1977/78 | 1978/79 | 1979/80 | 1980/81 |
|---|---|---|---|---|---|---|
| Longitudinal | 1976 Weekday College | HPM SPI AS | SPI AS | HPM SPI AS | HPM SPI AS CQ | Careering Follow-up → |
| | | | ICS SPC | | SPC | |
| | 1977 Weekday College | | HPM SPI AS | SPI AS | HPM SPI AS | Careering Follow-up → |
| | | | | ICS SPC | SPC | SPC |
| | 1977 Weekend College | | HPM SPI AS | SPI | HPM SPI AS | HPM SPI AS CQ |
| Cross-Sectional | 1972/73 Weekday College (Pilot) | HPM/HPM SPI/SPI AS | | | | |
| | 1973/74 Weekday College | | HPM/HPM SPI/SPI AS SPC | | Careering Follow-up → SPI CQ | |

Note. See Figure 1 for overview of components of the program validation model with measures. Student Perspectives Interview (SPI) data were collected on a subsample of students participating in the administration of the Human Potential Measures (HPM), but all completed the Attitude Survey (AS) and Careering Questionnaire (CQ). All Weekday College students completed the Integrated Competence Seminar (ICS) and were rated by faculty on the Six Performance Characteristics (SPC).

Additionally, Six Performance Characteristics ratings can be compared with performance on the Integrated Competence Seminar, and with other college performance variables collected in the longitudinal study: the number of semesters attended during each of the two intervals between assessment, the number of credit hours successfully completed in each interval, and the number of competence level units achieved in each interval.

The Six Performance Characteristics rating was not conducted with students in the Weekend College. The student population described in this report was relatively homogeneous with respect to such variables as age, marital status, and religious affiliation. A large majority of students were 17 to 19 years old at entrance, not married, and attending full time.

Seventy per cent identified themselves as Catholic, two-thirds were commuting, and two-thirds were intending to major in nursing. Each of these separate background or program characteristics is highly interrelated with the others, a fact which indicates there was a typical student described by most or all of these classifications, and a small percentage of atypical students who were likewise not identified by most or all of these classifications. For example, if a student were older than 19 at entrance, there was also a good chance that she was married, attending part-time, and not Catholic. This simple inverse portrait does not hold for residence and major however. Atypical students were most likely nursing students and were commuting. Otherwise typical students provided the small percentages of majors in traditional liberal arts disciplines and resident students. A more detailed description of the student population can be found in the longitudinal study of student change on the human potential measures (Mentkowski & Strait, 1983).

## Relationships Between Six Performance Characteristics Ratings and Student Background and Program Variables in the Longitudinal Study

Not surprisingly, due to the homogeneity of the sample, there were few statistically significant correlations between ratings and student background or program variables. There was a small, but significant correlation between ratings coinciding with second assessment, and students' high school grade point averages ($r$ = .220, $n$ = 110, $p$ = .01). There were no significant correlations with age, religious affiliation, parents' education or occupation, marital status or prior college experience.

There was also a sizable correlation between ratings and entrance cohort ($r$ = .481, $n$ = 129, $p < .001$). The interpretation of this association is made difficult by the fact that the ratings for the two cohorts were conducted a full year apart and under changing procedures. Thus, the correlation may indicate a

significant change in faculty judgments. On the other hand, the measures of human potential also show significant cohort effects in the study of change (Mentkowski & Strait, 1983), so the correlation may, at least in part, reflect actual group differences in the two entering classes.

There was a high correlation between repeated ratings a year apart ($r$ = .667, $n$ = 125, $p$ < .001), indicating stability in ratings. Variability in ratings coinciding with third assessment not explained by ratings the preceding year was not related to any background or program characteristics.

## Analysis of Six Performance Characteristics Ratings for the Weekday College Longitudinal Sample

The combined classes provided a longitudinal sample of 136 students. Six Performance Characteristics ratings were available for 129 of those students at second assessment, and 131 of the students at third assessment. In the analysis of results from the first all-college rating in 1979, it was shown that the characteristics were developmental, based on the significant mean differences and rating distributions among academic classes. At the same time, it was shown that the intercorrelations among the characteristics were very high, i.e., each characteristic seemed to be showing a nearly identical pattern. Ratings data from the longitudinal sample provided strong evidence supporting the implication that the five ratings (discounting the special case of the Habituality rating) were redundant indices of a single, global judgment.

Table 11 presents intercorrelations of the five characteristics for the same students on three occasions. The consistently high correlations indicated that a single underlying dimension was being rated rather than six differentiated characteristics. This interpretation was further confirmed by factor analyses at each occasion which resulted in a single principal factor accounting for approximately ninety per cent of the total variance among ratings.

On the basis of this strong evidence for a single underlying factor, further analyses of the longitudinal data were carried out using the single factor score instead of the five or six separate characteristic scores.

Using the single factor score, the evidence of class differences in the cross-sectional analysis of 1979 ratings was corroborated by evidence of significant change over time in the longitudinal study. Figure 4 shows the mean rating of students over three occasions of assessment. Similar change over time was found for the 1976 entrance cohort between 1979 and 1980 ratings.

Table 11.

Intercorrelations of Six Performance Characteristics on Three Occasions (1977 Entrance Cohort)

| Characteristics | Spring '79 | Spring '80 | Spring '81 |
|---|---|---|---|
| Integration-Independence | .90 | .90 | .86 |
| Integration-Creativity | .68 | .87 | .79 |
| Integration-Awareness | .79 | .85 | .80 |
| Integration-Commitment | .75 | .81 | .69 |
| Independence-Creativity | .73 | .88 | .83 |
| Independence-Awareness | .83 | .85 | .82 |
| Independence-Commitment | .78 | .83 | .79 |
| Creativity-Awareness | .72 | .85 | .83 |
| Creativity-Commitment | .67 | .72 | .73 |
| Awareness-Commitment | .79 | .78 | .82 |

Note. Correlations based on 75 students.

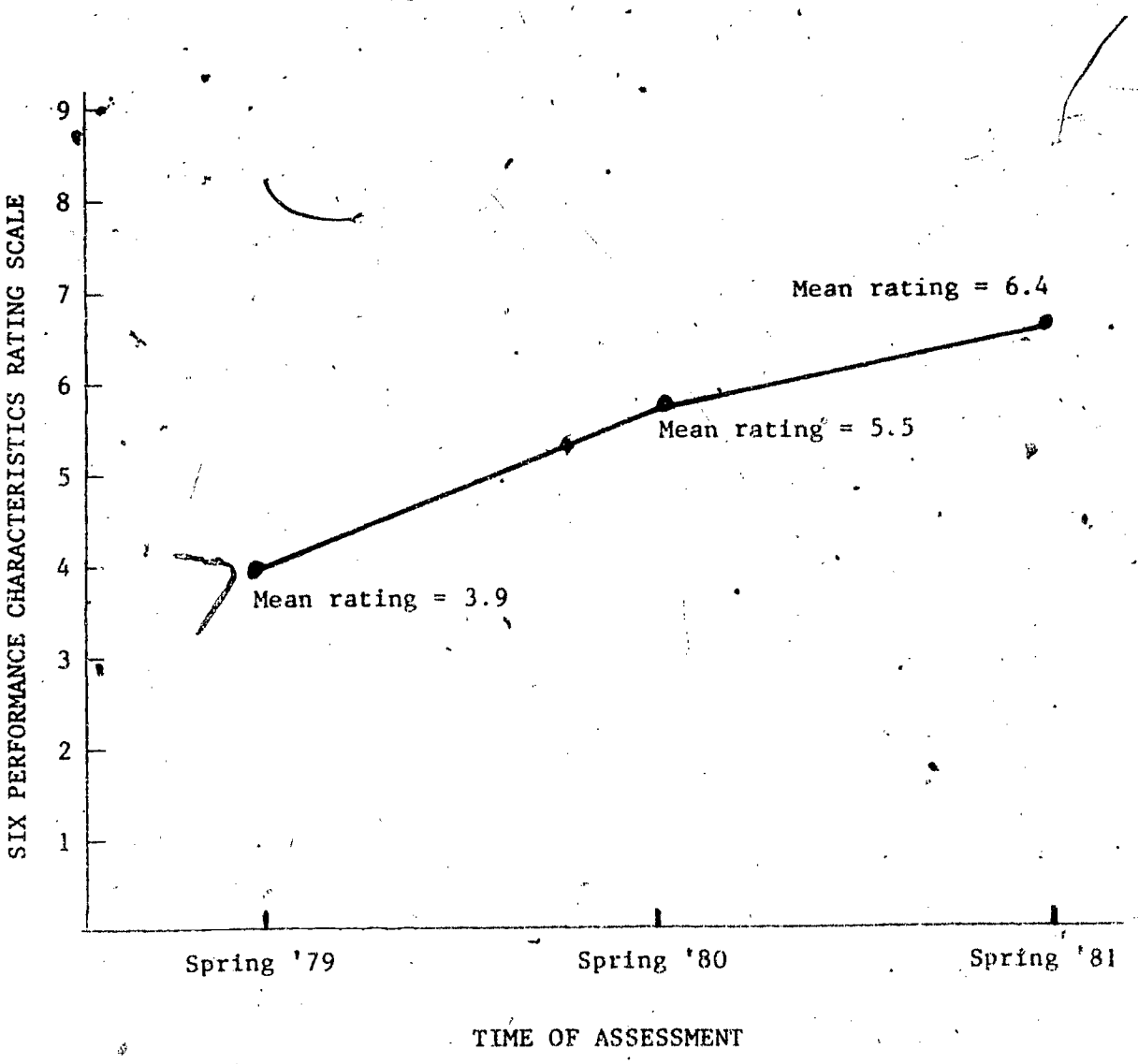


Figure 4. Change in Mean Rating Over Three Occasions of Assessment (1977 Entrance Cohort).

## Relationships Between the Six Performance Characteristics Ratings Factor and Other College Performance Measures

There were no significant partial correlations between the Six Performance Characteristics rating factor and other college performance measures, controlling for variability attributed to student background and program differences. For the combined Weekday College cohorts, the number of semesters attended between entrance and the second longitudinal assessment was related only to students' major field of study. Controlling for this source of variance, there was no relationship between number of semesters attended and faculty ratings. Credit hours accumulated during the same period were correlated with students' age, major field, and full-time status. Controlling for these differences, there was no relationship between faculty ratings and the number of credit hours successfully completed. Competence level units achieved were associated with students' high school grades, their mothers' occupations, and major field and full-time status. The partial correlations between competence level units and faculty ratings were not significant with these variables controlled. This finding corroborated earlier evidence of no relationship between ratings and rate of learning in the analysis of the first all-college sample in 1979.

The other measure of student performance developed by Alverno faculty, the Integrated Competence Seminar, is covered in more detail in another report (Assessment Committee/Office of Research and Evaluation, 1982). Scores on that performance measure were also not related to faculty ratings, when other sources of variance were controlled.

While the Six Performance Characteristics rating factor were not associated uniquely with semesters, credits, or competence level units in the longitudinal study, one piece of evidence was supportive of the discriminating power of the faculty ratings shown earlier in relation to major field, honors, and academic classification. A group of students on academic probation in the fall of 1981 were found to have received significantly lower faculty ratings the preceding spring than students not on probation. In each of these instances of group differences however, it should be noted that control variables were not available as they were in the longitudinal study.

## Relationships Between the Six Performance Characteristics Rating Factor and Human Potential Measures in the Longitudinal Study

As stated earlier, the repeated administrations of the human potential measures at entrance, two years later, and three and one-half years later, and the repeated faculty ratings on the Six Performance Characteristics afford multiple sets of correlations in different temporal relationships. When so many correlations are generated, the possibility is much greater that the usual conventions for assigning statistical significance will be met by pure chance. Therefore, the following results emphasize patterns of statistically significant relationships in the data rather than focusing on individual bivariate relationships.

Examining the many possible relationships between the Six Performance Characteristics factor score and the human potential measures, our general conclusion was that a cognitive-developmental factor was being evaluated by the faculty. Table 12 lists those measures that showed significant relationships to the faculty rating in the left column, and those that didn't in the right column. Significant relationships existed with all of the human potential measures specifically designed to assess very broad dimensions of cognitive development: a measure of Perry's scheme of intellectual and ethical development in the college years (Perry, 1970, 1981), Loevinger's (1970, 1976) measure of ego development, a measure of Kohlberg's theory of moral development (Rest, 1979), and a measure of cognitive development as defined by Piaget. The simple correlations are presented in Appendix F.

When all student background and program differences related to the human potential measures and the faculty ratings were controlled, the few statistically significant partial correlations still supported this general conclusion. Faculty ratings coinciding with second assessments were significantly correlated with entrance assessments from the three essays measuring Perry's scheme of intellectual and ethical development ("Best Class" essay, $r = .215$, $n = 98$, $p = .032$; "Decision" essay, $r = .234$, $n = 96$, $p = .021$; and "Career" essay, $r = .250$, $n = 78$, $p = .025$).

Furthermore, faculty ratings coinciding with second assessments were significantly correlated with change on some of the human potential measures during both intervals. Change during the first two years on the Perry "Best Class" essay unexplained by differences at entrance was correlated with faculty ratings, as was change on Rest's measure of moral development, Stewart's Receptive Stage of Adaptation, and the Watson-Glaser Critical Thinking Appraisal. During the second two years, faculty ratings were correlated with the Perry "Decision" essay and Rest's measure of moral development.

Table 12.

Relationships Between Six Performance Characteristics Factor and Human Potential Measures

| Significant Relationship | No Significant Relationship |
|---|---|
| Measure of Vocational, Educational and Personal Issues (Perry) | Picture Story Exercise - Self-Definition (Stewart) |
| Sentence Completion Test of Ego Development (Loevinger) | Picture Story Exercise - Achievement Motivation (McBer) |
| Defining Issues Test (Rest) | Picture Story Exercise - Affiliation Motivation (McBer) |
| Test of Cognitive Development (Piaget) | Picture Story Exercise - Power Motivation (McBer) |
| Picture Story Exercise - Stages of Adaptation (Stewart) | Learning Style Inventory (Kolb) |
| Critical Thinking Appraisal (Watson-Glaser) | Test of Thematic Analysis (Winter) |

Note: These relationships represent generalizations from four correlation coefficients derived from two faculty ratings with second and third assessments of human potential measures. Approximately 120 students were included in each analysis.

From these patterns of relationship, we concluded that the faculty were sensitively rating differences and growth in student development, but in a global fashion, not according to five or six differentiated characteristics.

Summary and Discussion

Alverno College faculty have developed an assessment technique that can be used to rate students on important characteristics of their performance across competence areas and disciplinary lines. The faculty demonstrated that they could successfully implement such an institution-wide rating procedure.

Results from the first college-wide faculty rating indicated that an acceptable level of inter-rater reliability was achieved irrespective of whether the faculty rater was from the student's major or minor department, or was an instructor in a single class (in the case of Freshmen and Sophomores). It was determined that the consensus process accomplished the same as averaging the ratings of two faculty, thus permitting a simpler and less time-consuming process in subsequent years.

It was found that faculty recognized individual differences within each class by using the full nine point scale, and that there were significant mean differences in ratings for each class, with Freshmen lowest and Seniors highest. Although these findings supported the intention of creating developmental descriptions of the characteristics, ratings across the characteristics were found to be very similar.

In all phases of the development and testing of the instrument, very high correlations were found among the characteristic ratings. Factor analyses of data from the longitudinal sample on three separate occasions confirmed that a single underlying characteristic was being rated, rather than six performance characteristics as differentiated by the handbook definitions. The longitudinal data provided evidence of significant improvement over time in ratings of two entrance classes, corroborating the earlier cross-sectional evidence for a developmental measure.

The ratings were not correlated with other indices of student performance in the college, when background and program variables influencing these indices were controlled. This indicated that faculty were not merely rating students according to their achievements in successfully completing the curriculum. There was also no relationship found between the Six Performance Characteristics rating and the Integrated Competence Seminar assessment developed by the college. More detailed analysis of performance on the Integrated Competence Seminar (Assessment Committee/Office of Research and Evaluation, 1982) raised questions concerning the validity of some of the Exercises in that assessment, however.

The Six Performance Characteristics rating factor was correlated with several measures of human potential administered in the college's longitudinal study of student development (Mentkowski & Strait, 1983). These relationships supported the idea that the underlying dimension being rated by faculty was a general cognitive-developmental continuum. Among the human potential measures, the strongest pattern of associations with the Six Performance Characteristics rating factor was found with a measure of Perry's scheme of intellectual and ethical development in the college years (Perry, 1970, 1981)

Throughout the development and several cycles of analysis of the assessment technique, the faculty have discussed the various possible practical applications of the assessment technique beyond its employment in the comprehensive program validation model. In Alverno's curriculum, narrative transcripts play an important role as a record of student progress. Faculty have found the rating process, and the data and written comments it has generated, especially useful in the preparation of narrative transcript material for students' records.

The faculty is continuing to experiment with the assessment technique as this report goes to press. Further, and future, information can be obtained from the Office of Research and Evaluation or the Alverno College Assessment Committee.

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# APPENDIX A

## Description of the Six Performance Characteristics

Developed by
Assessment Committee
Alverno College
Milwaukee, Wisconsin
May, 1978.

# INTRODUCTORY STATEMENT REGARDING CHARACTERISTICS OF ADVANCED STUDENTS

During her first semesters at Alverno College the student develops her competence in each of eight specified areas by focusing directly on the meaning, structure, and applicability of each competence within varied disciplines. As she gains assurance and experience in each competence area, she exercises her abilities more extensively in a variety of situations and, consequently, experiences the interdependence of abilities with respect to each other and with respect to systematic areas of knowledge.

This experience of interrelatedness, with its corresponding sense of personal internalization of abilities, becomes especially evident to her as she enters into specialized study in her major area. By exercising the range of her talents in developing the complex abilities required by her major area, the student develops qualities which characterize her way of approaching tasks and of handling responsibility.

At the present time we are able to specify five such characteristics which apply to her behavior — integrated, independent, creative, self-aware, committed — and a sixth — habituality — which modifies the others. The development of these characteristics takes place initially as she strives to acquire or to improve abilities demanded by her discipline or profession. Gradually, the characteristics themselves become central to her style of working and to her exercise of personal responsibility.

Because we think of these as contributing to personal and professional life and because we believe in the possibility and importance of making judgments about them, we incorporate them as general criteria in assessing student endeavor at advanced levels. As faculty assess students on designated abilities required for the major, these six characteristics function as criteria.

Also, because we believe these characteristics continue to develop in a person's professional and personal style of exercising responsibility, we incorporate assessment of them into our longitudinal evaluation program. Prior to graduation, faculty and other evaluators make independent judgments on a senior's manifestation of these characteristics. Later, our graduates themselves and other appropriate individuals will utilize these criteria in judging the degree to which the work of the graduate as a professional and the graduate herself as a person manifest these characteristics.

# INTEGRATION

(Wholeness, Unity, Soundness, Completeness)

A characteristic which is revealed by a growing harmonious relationship among one's inner resources and which is manifested by congruent behavior in interacting with one's total environment.

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Understands content on a quite literal level. Nuances, overtones, and connotations await further development | | |
| • Senses relationships between various academic disciplines and abilities but largely relies on explicit examples of this from external sources of authority | • Describes relationships between various disciplines; seeks to coordinate disciplines that are complementary and mutually supporting | |
| • Needs explicit help in academic and personal goal-direction and time-management | | |
| • Identifies with a single perception from an external authority and submits in a somewhat passive manner to the directions of others in her learning process; needs frequent reinforcement from external authority in the accomplishment of her academic work | • Recognizes the complexity of human issues presented in the various disciplines. (How do I reconcile the individual and community, the particular and the universal, law and liberty? How do I bring together feeling and thinking, reason and imagination, subjectivity and objectivity?) Is willing to wrestle with this dialectic | • Can take multiple perspectives on issues arising from the various disciplines and from her own personal life experiences |
| • Perceives areas of her life as compartmentalized into a multitude of worlds: family, school, leisure, politics, nations, religions, ideologies; frequently loses "Who I am" as she goes from one area of her life to another | • Evidences an awareness of the tension of polarities in her own personal life as well but is willing to live and work with the tension in a creative manner | • Evidences a complementary dynamic between school, work, personal relationships with self as the integrating factor |
| • Describes self at the mercy of external factors and may use one area of [illegible] life escape an area that is viewed as [illegible]ern imposed | • Describes self as actively adapting to as[illegible] a[illegible] in[illegible] factor[illegible]ous [illegible] pe[illegible]l profes[illegible] | |
| • Evidences personal concern for her own performance rather than felt responsibility for total group movement when she is working in collaboration with others | | • Is concerned with her personal future and sees herself linked inseparably with the future of the human community |
| • Understands in a limited way the connection between theory and praxis in her life | • Initiates gathering of personal insights from past and present role models of the total human community who have demonstrated by their behavior that they have achieved integration between theory and praxis | • Begins to come across as a simple, lucid interpreter of life consonant with her own experiential background. Reliance on authority and tradition is meshed with a personal synthesis of her own lived experience |
| | | Moves toward realizing ultimate meaning (transcendence) in the midst of the limiting boundaries of her life cycle |
| | | Incorporates insights from her personal past experiences into her future role within the human community |







Developed by
Assessment Committee
[illegible]o College
[illegible]kee, Wisconsin
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# INDEPENDENCE

The student who operates with independence, to a lesser or greater degree initiates, develops, and carries through to completion experiences relating to her formal educative process, either academically, professionally, or personally. In some way, she sets and achieves her own educational, career, and life goals in a manner that reaches beyond the expressed requirements of her area(s) of study; that is, she uses her ability to initiate and execute work on unfamiliar data and to apply this in new areas. She does this with a growing curiosity, enthusiasm, and energy.

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Manifests aspects of independent activity in discrete learning situations (e.g., chooses a topic from a variety of offered alternatives) | • Initiates activity by responding to an open-ended stimulus (e.g., selects an appropriate framework for analyzing an art piece) | • Manifests facility for initiating, planning, executing, and evaluating processes and projects related to her area and her profession |
| • Follows concrete suggestions and directions for specific instances in her educative process | • Advances plans with fewer directions and/or suggestions (e.g., often suggests or designs subsequent steps within a process) | • On her own, tackles data on unfamiliar areas and extracts from many and varied experiences to relate them meaningfully to her immediate educational and professional experiences |
| | Perseveres toward an immediate goal in the face of obstacles | |
| • Usually acts when something is called for or when she is given something to take hold of (e.g., responds to stimuli presented by the instructor) | • Begins to extend the modes of procedure learned in her academic life, to her professional and personal life | • On her own, takes hold of a situation; analyzes, organizes, and synthesizes it in relation to a self-chosen operational goal; and perseveres toward that goal educationally, professionally, and personally |
| | • Grows in curiosity and enthusiasm for learning that expresses itself in some interest and involvement beyond the requirements and expectations of her discipline (e.g., relates concepts or issues from one area to another area) | • Reaches out, with spontaneous enthusiasm, beyond the formal requirements of her discipline and her profession for something involving totality in her life |
| | | Energetically and enthusiastically brings into her educational, professional, and living experiences things she sees and hears that others do not perceive |
| | | • Demonstrates an awareness of the interdependence of persons by working with others in giving and receiving (e.g., appropriately shares or delegates authority and/or responsibility in group tasks) |

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# CREATIVITY

Creativity is the characteristic of the person which manifests itself by means of various creative styles. One such style is to produce original or unique ideas. Another equally valid style is to rearrange or uniquely synthesize the ideas of others without necessarily originating them. Persons may be strong in one style or another or possess aspects of both. These styles spring from a number of unique, individual characteristics such as imagination, flexibility, openness, inventiveness, etc. In order for these styles to be assessed, they must somehow be demonstrated in the student's behavior. Therefore the elements of an individual's creative style including its developmental processes are stated here in terms of behaviors which would result from that style(s). (The products of creativity are frequently different across discipline areas; however, the intent here is to focus on some generic aspects of the creative process.)

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Produces responses which are original or unique, but not clearly focused around a central idea or goal, etc. | • Begins to perceive the value of producing a variety of ideas with respect to creating a product, reaching a goal, solving a problem<br><br>Begins to perceive that the creative process should not be an end in itself but should be a means toward some end<br><br>(Note: In both of the above, the student is learning about and how to use the learning structures as tools of the discipline as aids to the creative process.) | • Internalizes the value and function of the creative process such that it is purposive and evoked without outside direction |
| • Requires multiple examples of an idea, concept, method | • Generates similar examples when given some examples of idea, method, etc.<br><br>Extracts the concept when given an example | • Can generate own unique examples; requires a minimal number of examples in order to understand method, concept, etc. |
| • Primarily has an affective (positive or negative) response to unanticipated circumstances or ideas<br><br>Deals with unanticipated circumstances, but may allow self to become sidetracked | • Begins to see that unanticipated circumstances may not be obstacles but opportunities for the creation of new ideas | • Demonstrates flexibility when confronted with unanticipated circumstances or ideas |
| • Interprets and follows directions literally<br><br>Relies upon step-by-step means to reach a goal | • Begins to perceive need for creating new options or ideas<br><br>Perceives directions as guidelines but is able to go beyond them by creating new options or ideas | • With minimum direction can select and/or synthesize others' ideas in a unique manner or can generate her own unique ideas |
| • Perceives creativity as a quality one possesses, e.g., talent, rather than an ability one develops | • Begins to perceive that different creative styles exist and begins to identify own preferred creative style | • Recognizes own creative style as well as the creative style of others<br><br>Knows when and how to apply own creative style (including collaborating with others having different creative styles when appropriate)<br><br>• In given situations can articulate own creative process as well as defend it by producing a rationale |

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# AWARENESS (OF CAPABILITY)

A characteristic of the person which also includes as its "object" all of the person's other characteristics (independence, creativity, etc.).

A characteristic which operates as a series of developmental stages within the development of other characteristics.

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Has theoretical knowledge of some characteristics of competent and incompetent performance | • Sees a criterion as something she either can do or can't do right now | • Has so internalized the idea of self-assessment that she practices it habitually |
| Makes tentative and tenuous applications of abstract criteria to any aspects of her own behavior that she can take seriously enough to momentarily look at apart from herself | Begins to sense when her own performance in a given situation is essentially competent or incompetent | |
| • Experiences any evaluation of herself as general affirmation or general rejection | • Identifies individual strengths and weaknesses that consistently appear in her performance | • Identifies specific strengths and weaknesses but puts them into perspective |
| • Makes judgments or her own behavior usually only after someone else points out concrete evidence for her | • Begins to make judgments related to behavioral observation | • In a given situation, makes independent judgments about her general effectiveness which are congruent with those of others who are careful, experienced observers. |
| | | Makes some reasonable predictions, in new situations, about whether or not she can develop abilities she has not considered before but which she sees that this situation calls for (can ask such questions as: What abilities do I bring to this situation? What do I know about this situation that will assist me to insure a competent performance? How is this situation different? What do I still need to learn about this situation?) |
| • "Does" activities as required in her academic program but does not identify with them as expressions of her own abilities that she can understand and develop | • Begins to experience her own abilities in relation to her effectiveness or ineffectiveness in a given situation | • Articulates her own abilities in relation to each other, to their operation in different contexts, and to experienced change in herself |
| • Tries to keep evaluation outside of herself | • Makes occasional, sometimes unrelated, decisions to develop some strengths and to eliminate some weaknesses and ignore others | • Makes thoughtful, consistent decisions about which aspects of her abilities she should consciously focus on for development and which she should not |
| | Consciously makes occasional discrete relationships between her strengths and her personal and professional goals | Experiences the development of her strengths as the gradual achievement of her personal and professional goals |

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Alverno College
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May, 1978

# COMMITMENT

(Self-initiated Obligation, Involvement, Entrustment, Reasoned Belief)

A characteristic demonstrated by actively engaging oneself in finding and living out of a mission. The student undertakes and completes activities or involvement in issues related to her own beliefs, attitudes, and values; that is, those issues that encompass and surpass the "here and now."

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Focuses on issues directly affecting her personal life; sees issue in relation to personal goals | • Participates on her own initiative (minimally--number of times as well as responsibilities) in activities/ concerns fostering identification and involvement in issues | • Focuses on selective concerns/issues that are consistent with her beliefs and attitudes; sees herself in relation to the issue |
| • Selects concerns and issues within contexts of formal learning experiences, whether these affect her career choice, profession, or world environment | • Involves herself in activities beyond her specified class related work | • Involves herself in concerns/issues that are larger than her specific career choice |
| • Articulates concerns related to day-to-day situations (usually crisis-oriented) | • Verbalizes concerns and involvement in personal issues related to career choice | • Tries to convince others of the importance of their involvement and articulation of concern |
| • Responds in a sporadic and not yet consistent manner to issues | • Responds actively and positively to concerns | • Prioritizes areas of concern and involvement |
| • Responds to situations in which she is personally asked to participate | | • Responds with constructive suggestions for others to consider |
| • Responds to situations on a short-term basis | | • Expends significant time and/or energy in active participation in area of professional field and/or role as citizen |
| | | Promotes activities/issues which support her view of the action needed in defined areas of her profession and life |

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Alverno College
Milwaukee, Wisconsin
May [illegible]

# HABITUALITY

Habituality is a dimension of the other five basic characteristics of the person. Habituality modifies the other characteristics of the person in several senses:

a) frequency, consistency— How often do the characteristics manifest themselves? To what extent are the characteristics predictable in a person's behavior?

b) spontaneity, comprehensiveness— To what extent is the source of the characteristics internal or external to the person (i.e., are the characteristics external expectations or internal needs)?

c) ease, perfection of operation— When the characteristics are manifested, does the person experience positive or negative affective awareness?

d) endurance— Do constraints serve as occasions for rallying the other characteristics or as occasions where these characteristics wane?

| BEGINNING STUDENT | DEVELOPING STUDENT | GRADUATING STUDENT |
|---|---|---|
| • Is inconsistent in her exhibition of the characteristics of the person; frequency of demonstration is determined by factors outside herself | | • Exhibits the characteristics of the person frequently and consistently |
| • Knows that she can demonstrate or use certain abilities but has not associated these abilities with herself as a person<br><br>Applies learned skills primarily in the formal classroom setting | • Begins to experiment with skills in new situations<br><br>Begins to generate more enduring uses of particular abilities and transfers these uses outside of formal educational settings | • Exhibits the characteristics of the person in a wide variety of contexts (academic, pre-professional, social, and personal) |
| • Responds to external stimuli (instructors' directions) rather than acting spontaneously | • At times spontaneously incorporates a number of skills in approaching a problem | • Has developed a set of internal standards for her behavior<br><br>Uses these standards to help her strive for quality and professionalism and will gain an affective dissatisfaction with failure to meet these internalized standards whenever possible<br><br>Exhibits the characteristics of the person, even in the face of contradictory external pressures |

Developed by
Assessment Committee
Alverno College
Milwaukee, Wisconsin
May, 1978

APPENDIX B

Pilot Study of Six Performance
Characteristics Rating,
Spring 1978

Presentation by the Office of Research and Evaluation to the Assessment Committee on the pilot study of the Six Performance Characteristics Rating

The relative frequency distribution of students who were rated on the Six Performance Characteristics are presented in graphic form. The graphs indicate that the majority of students cluster around the Developing and Graduating points of the scale (5-9), but the patterns of the distribution varied across characteristics. Habituality and Integration followed almost an identical pattern. Independence and Commitment were distributed in a somewhat similar pattern and so were Creativity and Self-Awareness (see Figures 1 and 2).

A table of inter-correlation of all Six Performance Characteristics is presented (see Table 1). Correlations range from .59 to .78. All were significant at the .001 level, indicating that all Six Performance Characteristics are highly interrelated.

Consistency of faculty judgments (inter-student consistency) was examined by investigating faculty ratings across divisions. Do faculty members in a particular division tend to rate students higher or lower? Students' mean ratings were examined in the following divisions: Arts and Humanities, Behavioral Sciences, Education, Mathematical and Natural Sciences, Nursing and Performing Arts (see Table 2).

The final multivariate statistical analysis indicated that Education students were rated significantly higher than Nursing students within three characteristics: Independence, Creativity and Self-Awareness.

Based on this analysis one cannot conclude that faculty members tend to rate higher in a particular division. The significant difference obtained may be due to the fact that 33% of the Education students as opposed to only 24% of Nursing students were awarded Honors. Education Honor students may have raised the means of the ratings. This may support the assumption that higher ratings in the divisions may be due to higher performance of students rather than differences in faculty rating.

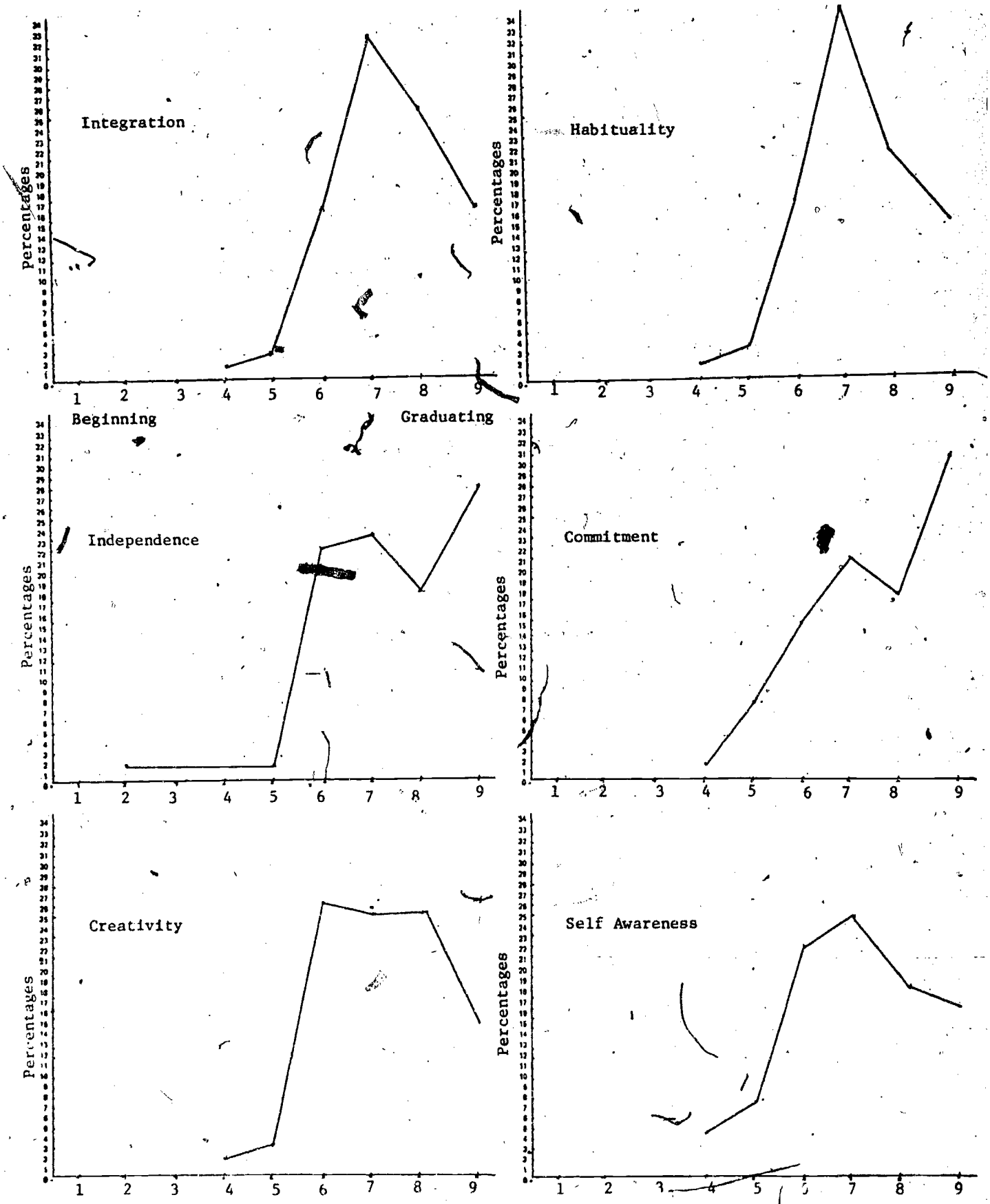



Figure 1. Frequency distributions of Six Performance Characteristics rating for 1978 graduating seniors.

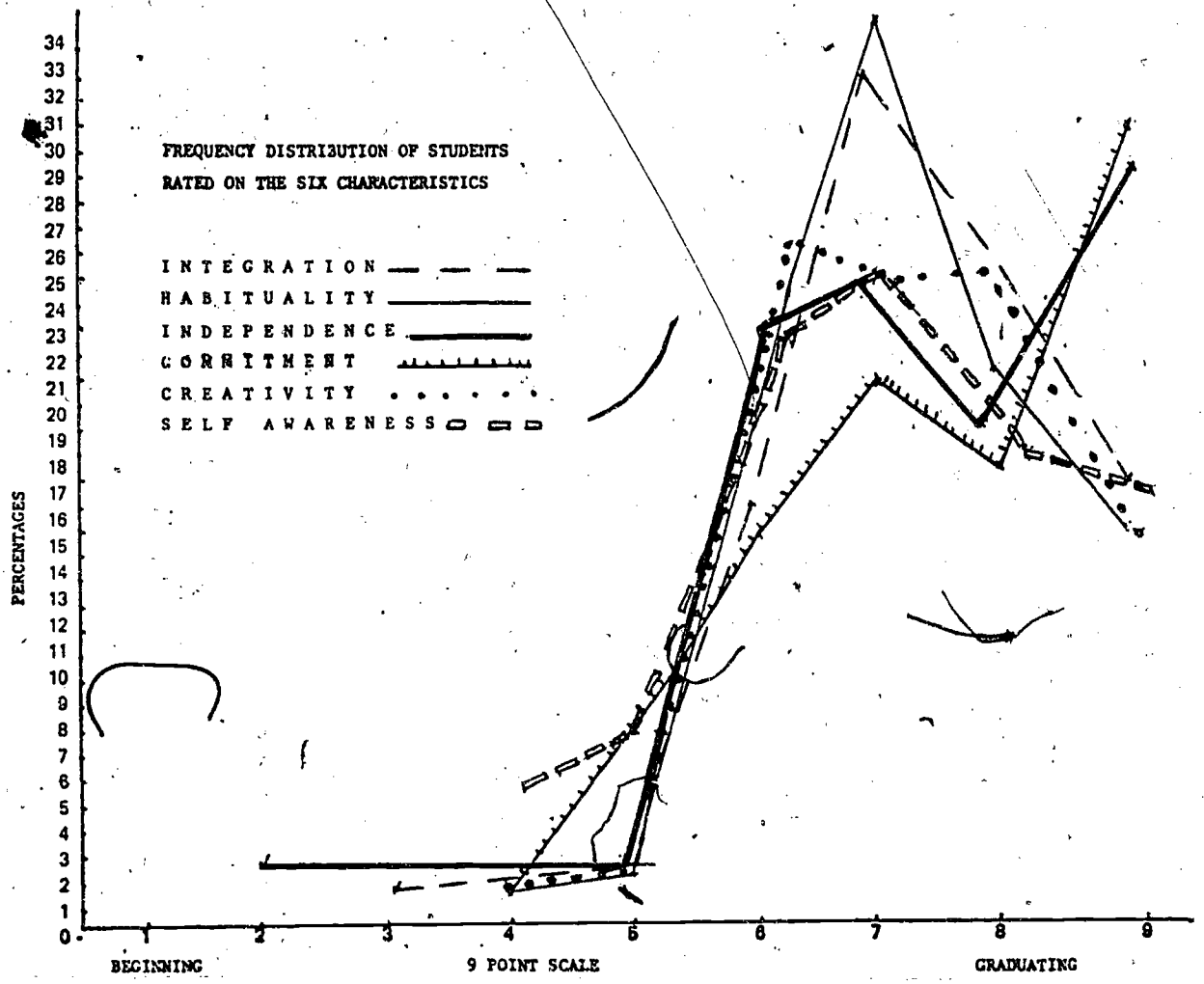



Figure 2. Combined frequency distributions of Six Performance Characteristics ratings for 1978 graduating seniors.

Table 1.

Inter-correlation Coefficients of the Six Performance Characteristics Ratings for 1978 Graduating Seniors

| | Integration | Independence | Creativity | Self-Awareness | Commitment | Habituality |
|---|---|---|---|---|---|---|
| Integration | 1.0000 | .7555 | .7236 | .7792 | .7269 | .7511 |
| Independence | .7555 | 1.0000 | .7286 | .6971 | .5914 | .6616 |
| Creativity | .7236 | .7286 | 1.0000 | .7850 | .6728 | .6375 |
| Self-Awareness | .7792 | .6971 | .7850 | 1.0000 | .7723 | .7588 |
| Commitment | .7269 | .5914 | .6728 | .7723 | 1.0000 | .7747 |
| Habituality | .7511 | .6616 | .6375 | .7588 | .7747 | 1.0000 |

Note. All coefficients in the table are statistically significant at the .001 level.

Table 2.

Means and Standard Deviation of Six Performance Characteristics Rating for 1978 Graduating Seniors Across Divisions

| Division | n | | Six Characteristics: Integration | Independence | Creativity | Self-Awareness | Commitment | Habituality | Mean for Six Characteristics |
|---|---|---|---|---|---|---|---|---|---|
| Arts and Humanities | 2 | M | 5.500 | 5.000 | 5.500 | 6.000 | 6.000 | 6.500 | 5.6 |
| | | SD | 3.536 | 4.243 | 2.121 | 2.828 | 2.828 | 2.121 | |
| Behavioral Sciences | 6 | M | 7.167 | 7.667 | 7.000 | 6.333* | 7.500 | 7.000 | 7.11 |
| | | SD | .753 | 1.506 | .894 | 1.366 | 1.378 | .632 | |
| Education | 9 | M | 7.889 | 8.333* | 8.111* | 8.222* | 7.667 | 7.889 | 8.0 |
| | | SD | .782 | .707 | 1.054 | .833 | 1.323 | 1.054 | |
| Mathematical and Natural Sciences | 2 | M | 7.500 | 8.000 | 6.500 | 6.000 | 7.000 | 7.500 | 7.0 |
| | | SD | .707 | 1.414 | .707 | .000 | 2.828 | 2.121 | |
| Nursing | 33 | M | 7.121 | 7.121* | 6.909* | 6.727* | 7.152* | 7.061 | 6.7 |
| | | SD | 1.053 | 1.166 | 1.128 | 1.376 | 1.253 | 1.088 | |
| Performing Arts | 13 | M | 7.769 | 7.846 | 7.692 | 7.692 | 8.385* | 7.462 | 7.2 |
| | | SD | 1.301 | 1.144 | .947 | .947 | 1.044 | 1.127 | |

* Significant differences at the .01 level

So far the data have indicated consistency of inter-student ratings (judgment among students) and consistency of intra-student ratings (judgment of one student across Six Performance Characteristics).

The Office of Research and Evaluation then investigated the relationship between the Six Performance Characteristics and indicators of performance in the Alverno learning process, as well as their relationship to a cognitive-developmental measure (Loevinger's Ego Development Measure). Such an analysis may assist faculty in understanding what aspect of the students' development is being measured by the Six Performance Characteristics:

- Do the Six Performance Characteristics measure developmental changes in the person?
- Are the characteristics reflective of performance within the eight competences?
- Or both?

The measure of rate of validation was chosen as a way to examine student performance within the learning process through levels 1-4. The total number of validations (77) expected to be completed at the beginning of Junior year was taken as the maximum measure of rate of validation. Only students who had completed 6 semesters at Alverno were included.

When rate of validation was correlated with each of the Six Performance Characteristics, only Habituality was significantly correlated ($p < .04$). One should keep in mind that the measure of rate of validation reflects student performance through levels 1-4 whereas the Six Performance Characteristics reflect student performance also at the more advanced levels. This analysis did not support the idea that the rate of validation from levels 1-4 predicts performance at levels 5 and 6 as measured by these characteristics (see Table 3).

Table 3.

Correlation Coefficients Between Rate of Validation and Six Performance Characteristics Ratings for 1978 Graduating Seniors

| | | Integration | Independence | Creativity | Self-Awareness | Commitment | Habituality |
|---|---|---|---|---|---|---|---|
| Rate of Validation | r= | .1472 | -.018 | -.1886 | -.1298 | .0572 | .2581 |
| | p= | .162 | .399 | .102 | .192 | .351 | .030* |

Note. Total number of validations in all four levels = 77
All students were in their Junior year -- Spring, 1977
All 47 students had six semesters at Alverno

* $p < .05$

The Six Performance Characteristics were not significantly related to Loevinger's Ego Development Measure (see Table 4). Similar results were obtained when the Six Performance Characteristics were correlated with age (see Table 5). Further measures of the learning process and other developmental measures may be used to further refine the meaning of the Six Performance Characteristics.

Table 4.

Correlation Between Loevinger's Ego Development Measure and the Six Performance Characteristics Rating of Spring 1978 Graduates (n=32)

| | | Integration | Independence | Creativity | Self-Awareness | Commitment | Habituality | Average Score |
|---|---|---|---|---|---|---|---|---|
| Loevinger's Ego Development Measure | r= | .0172 | .1330 | .0512 | .1925 | .1222 | .2739 | .1455 |
| | p= | .463 | .234 | .390 | .146 | .253 | .065 | .213 |

Table 5.

Correlation Coefficients Between Age and Six Performance Characteristics from Ratings by Faculty of Spring 1978 Graduates (n=65)

| | | Integra-gration | Indepen-dence | Creativ-ity | Self-Awareness | Commit-ment | Habitu-ality |
|---|---|---|---|---|---|---|---|
| Age | r= | -.0093 | .0243 | -.0500 | -.0103 | .0774 | .0689 |
| | p= | .471 | .423 | .346 | .468 | .270 | .291 |

Another way of validating the measurement of the Six Performance Characteristics is to examine ratings of Honor students. Do Honor students demonstrate significantly higher ratings across all Six Performance Characteristics? Mean ratings of Honor students were compared (see Table 6) with mean ratings of students who did not achieve honors. Results obtained did indicate that honor students were rated significantly higher on each of the characteristics, but the fact that they were rated after being nominated cannot be overlooked.

Table 6.

Honor Ratings Compared to No Honor Ratings on Each of Six Performance Characteristics

| Characteristics | Honor/ No Honor | Number | Mean | Standard Deviation | t Value |
|---|---|---|---|---|---|
| Average Rating Across Six Characteristics | Honor | 14 | 8.6307 | .44420 | 6.58* |
| | No Honor | 51 | 6.9149 | .94281 | |
| Integration | Honor | 14 | 8.5714 | .64621 | 5.30* |
| | No Honor | 51 | 6.9804 | 1.0675 | |
| Independence | Honor | 14 | 8.7143 | .61425 | 4.45* |
| | No Honor | 51 | 7.0980 | 1.3154 | |
| Creativity | Honor | 14 | 8.4286 | .64621 | 5.29* |
| | No Honor | 51 | 6.8431 | 1.0653 | |
| Self-Awareness | Honor | 14 | 8.6429 | .63332 | 6.09* |
| | No Honor | 51 | 6.6078 | 1.2013 | |
| Commitment | Honor | 14 | 8.7857 | .57893 | 4.66* |
| | No Honor | 51 | 7.0980 | 1.3154 | |
| Habituality | Honor | 14 | 8.6429 | .49725 | 6.96* |
| | No Honor | 51 | 6.8627 | .91694 | |

* All t values are significant at the .001 level.

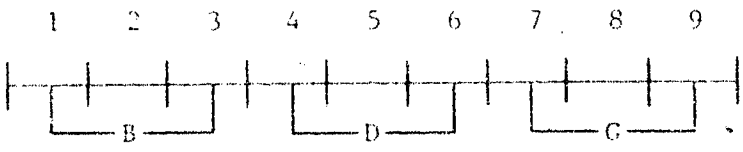
Several questions were raised by the Assessment Committee while discussing the data:

- Are the definitions of the characteristics adequately differentiating between each of the characteristics?
- Should students be rated by faculty both from the major and minor areas to improve the quality of the ratings?
- At what point in time should the rating be done? Before nominations for honors?
- When rating is done as a departmental activity, are students rated by faculty members who used to teach the students in their Freshman or Sophomore year but who are not familiar with their performance in the upper levels? By rating each year the process will be simplified. It will be an ongoing process in which faculty members will judge current performance.
- Can we obtain feedback from faculty members on how they judged students? What was the basis for judgment?
- It may be better to change the definitions rather than change the number of characteristics.
- To what extent did faculty members use the definitions while rating? How often are individual conceptualizations of the Six Characteristics used?
- Faculty should be asked to rate each class this spring. More data are needed before we begin reviewing the definitions of the characteristics.

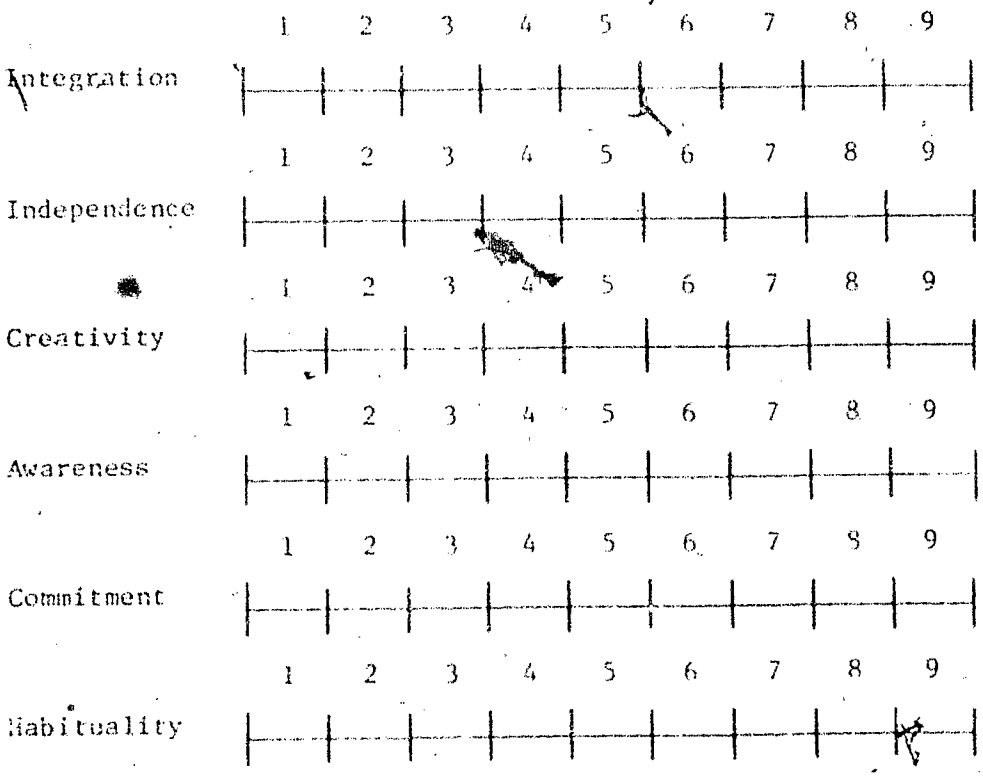
Name _____ Major _____

Please rate this student on each of the following six characteristics. Place a check (✓) in the space desired.

The scale is divided into 3 stages:




B = Beginning Student; D = Developing Student; G = Graduating Student




Note: Habituality modifies the other characteristics.
i.e., habitually committed, habitually independent, etc.

5/78

APPENDIX C

Revised Six Performance
Characteristics Rating Form,
Spring 1979

# SIX PERFORMANCE CHARACTERISTICS RATING

Assessment Committee/Office of Research & Evaluation
ALVERNO COLLEGE

Funded by a grant from the National Institute of Education:
Careering After College: Establishing the Validity of Abilities
Learned in College for Later Success
(NIE–G–77–0058)

Principal Investigators:
Marcia Mentkowski
Austin Doherty
Alverno College
3401 South 39th Street
Milwaukee, Wisconsin 53215

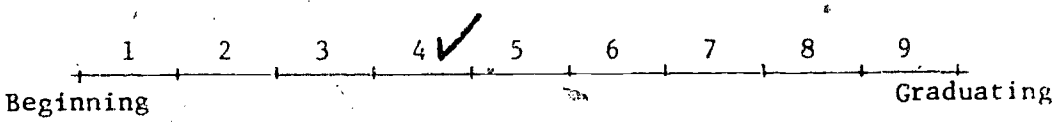
54

Name _____ Instructor _____

Circle one: Fr So Jr Sr Course _____

Major: _____

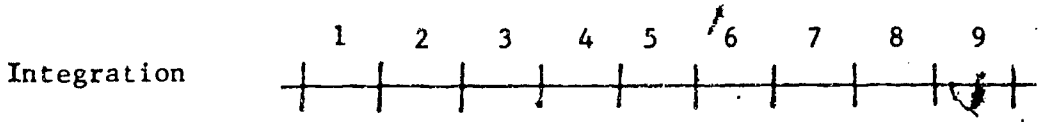
Please rate this student on each of the following six characteristics. Place a check (✓) in the pace desired.

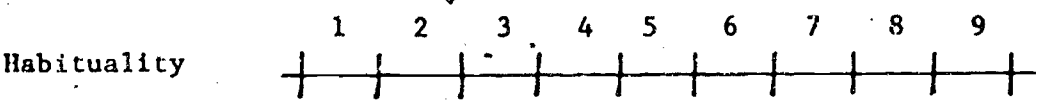



- While the definitions of the six characteristics describe the Beginning Student, the Developing Student and the Graduating Student, please do not limit your rating to "F" for Freshmen, "G" for Seniors, etc. Use the entire 9-point scale for each student.
- Study the definitions of all the characteristics (see Faculty Handbook on Learning and Assessment). We recognize that you will be rating the whole person. However, try to distinguish between each of the characteristics when rating an individual.
- The last page allows space for comments. Comments will provide an ongoing record of developmental performance that can assist faculty in preparing the narrative transcript when the student graduates.

Thank you for your contribution.

The Assessment Committee

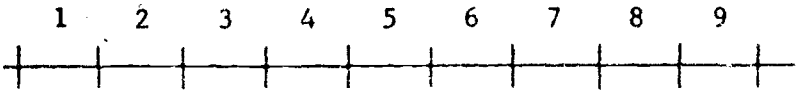


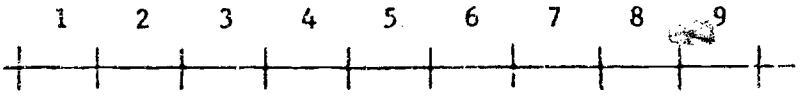

Note: Habituality modifies the other characteristics, i.e., Habitually Committed; Habitually Independent; Habitually Creative; etc.

If you have rated a student at 4 or above on this characteristic, then indicate on the Habituality scale the extent to which you have observed that this characteristic is habitual.

Independence



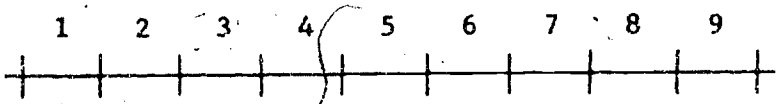

Habituality



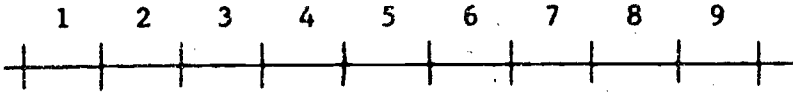

Note: Habituality modifies the other characteristics, i.e., Habitually Committed; Habitually Independent; Habitually Creative; etc.

If you have rated a student at 4 or above on this characteristic, then indicate on the Habituality scale the extent to which you have observed that this characteristic is habitual.

Creativity



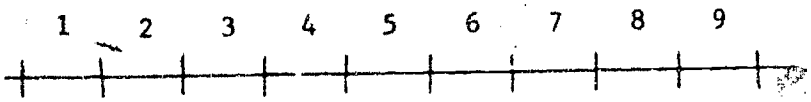

Habituality



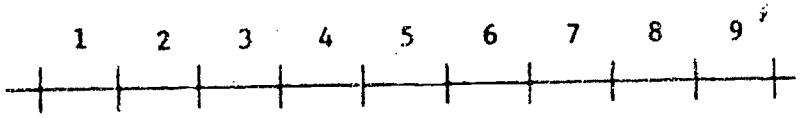

Note: Habituality modifies the other characteristics, i.e., Habitually Committed; Habitually Independent; Habitually Creative; etc.

If you have rated a student at 4 or above on this characteristic, then indicate on the Habituality scale the extent to which you have observed that this characteristic is habitual.

Awareness



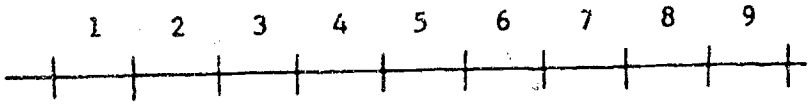

Habituality



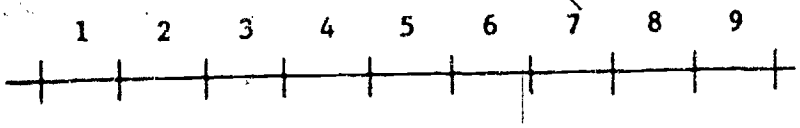

Note: Habituality modifies the other characteristics, i.e., Habitually Committed; Habitually Independent; Habitually Creative; etc.

If you have rated a student at 4 or above on this characteristic, then indicate on the Habituality scale the extent to which you have observed that this characteristic is habitual.

Commitment




Habituality




Note: Habituality modifies the other characteristics, i.e., Habitually Committed; Habitually Independent; Habitually Creative; etc.

If you have rated a student at 4 or above on this characteristic, then indicate on the Habituality scale the extent to which you have observed that this characteristic is habitual.

NOTE: A PAGE FOR COMMENTS FOLLOWS THIS PAGE IN THE INSTRUMENT.

APPENDIX D

Six Performance Characteristics
Rating Procedures, Spring 1979

Six Performance Characteristics
Rating Procedures, Spring 1979

1. All students in the Weekday College will need to be rated for us to further understand the developmental nature of the characteristics.

2. In order to obtain more reliable ratings, both the student's major and minor department should be asked to rate her in her Junior and Senior year on the Six Performance Characteristics.

3. Last year departmental consensus ratings for majors were obtained from at least two faculty ratings. We did not collect individual faculty ratings that were made before the consensus rating. This year, in order to add to our understanding of the role that expert judgment plays in the ratings, we need individual ratings first from at least two faculty. These faculty should be chosen on the basis of how closely they have worked with the student. Then the department (or faculty group) provides a consensus rating, during which time the faculty who filled out individual ratings would jointly fill out a separate consensus form. Both individual ratings before consensus and the final consensus rating would be collected.

4. Freshmen and Sophomores need to be rated by at least two of their instructors. The ratings would be averaged for this group. Consensus ratings would not be attempted for this group because of anticipated difficulties in creating time schedules for instructors to get together.

   In order to coordinate the ratings of the Freshmen and Sophomores, certain faculty with Freshman and Sophomore classes will be asked to rate their Freshman and Sophomore students. Since the faculty on the Assessment Committee are most familiar with the meaning of the Six Performance Characteristics, they will first be asked to rate. Other faculty will then be chosen to rate those students not covered by Assessment Committee members.

5. Given our need to prepare narrative transcripts at the end of the Senior year, comments recorded during the earlier years will provide us with some information that would be extremely helpful in creating a developmental picture of student's progress and outcomes for the narrative transcript. Thus, a comment sheet will be added to the rating form for this purpose.

6. In order to get underneath the sources for the expert judgment faculty use in rating, we will ask faculty who rated students to respond to a short questionnaire concerning the sources for their judgment after all ratings are completed.

Each chairperson will receive the following materials from the Assessment Committee:

1. Materials to rate all major and minor students in your department.

   a. List of all major and minor students in your department.
   b. Enough rating forms for each Junior and Senior student for both individual and consensus rating for major only.[1] Minor students rated once only.[2]

2. A list of instructors in your Division who will be asked to rate students who are Freshmen and Sophomores.

   a. A class list for each instructor who will be asked to rate.
   b. Enough rating forms for each instructor.

3. Questionnaires for the faculty on their use of expert judgment.

During Faculty Institute this spring, the Assessment Committee will explain the rationale and procedure to the faculty. The Chairpersons will then be asked to coordinate the scheduling of time within the Division so that the rating can be accomplished before May 25, 1979.

Thank you for your assistance in this worthwhile endeavor. We expect to be able to present the results in the fall Faculty Institute.

---

[1] Each major student is rated individually by two faculty. Those two faculty then come to consensus on a third form.

[2] Each minor student is rated by the one faculty member in the department who "knows" the student best.

APPENDIX E

Six Performance Characteristics Rating
Faculty Questionnaire, Spring 1979,
With Summary Data

HOW DID FACULTY RATE THE CHARACTERISTICS?

Purpose: We are interested in how the faculty rated. What was the basis for judgment? At this point in time, we expect that the ratings are an accurate indicator of faculty expert judgment, but we need clarification on what the various sources of this expert judgment are.

Please respond to the following sources:

1. Check the box next to each source you used, intuitively or analytically, to make judgments. Then rank order the sources you checked with "1" as most important, "2" as second most important, etc. There is space next to the source to comment on how it was used.

| Check If Used | Rank Order | | |
|---|---|---|---|
| 100% | 1 | observed behavior | _____ |
| 97% | 2 | performance on assessment techniques | _____ |
| 93% | 3 | conversation with student | _____ |
| 100% | 3 | your "sense" of the student | _____ |
| 96% | 4 | definitions of the characteristics | _____ |
| ___ | ___ | others _____ please list 1. | _____ |
| | | 2. | _____ |
| | | 3. | _____ |

2. How clear and understandable were the definitions?

| | Low | | | | | | High | |
|---|---|---|---|---|---|---|---|---|
| Integration | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 4.7 |
| Independence | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 5.0 |
| Creativity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 4.7 |
| Awareness | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 4.7 |
| Commitment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 4.9 |
| Habituality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | M = 4.7 |

3. What needs to be done to make this a more effective process?

4. How was consensus reached for the group of students you rated?

APPENDIX F

Simple Correlations Between Human Potential Measures

and the Six Performance Characteristics

Rating Factor in the Longitudinal Study

APPENDIX F Table 1.

Simple Correlations Between Entrance Assessments on the Measures of Human Potential and the Six Performance Characteristics Rating Factor

| Human Potential Measure at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | | Six Performance Characteristic Factor: Three and One-Half Years After Entrance | |
|---|---|---|---|---|
| Measures of Vocational, Educational and Personal Issues | | | | |
| "Best Class" Essay | .088 | (120) | .157* | (123) |
| "Decision" Essay | .053 | (121) | .123 | (124) |
| "Career" Essay | .056 | (109) | .087 | (109) |
| Sentence Completion Test | -.113 | (120) | -.075 | (123) |
| Defining Issues Test | | | | |
| P% Score | .103 | (104) | .134 | (107) |
| D Score | .053 | (104) | .139 | (107) |
| Test of Cognitive Development | -.022 | (118) | -.029 | (121) |
| Picture Story Exercise | | | | |
| Receptive | -.036 | (120) | -.010 | (123) |
| Autonomous | .073 | (120) | .114 | (123) |
| Assertive | -.007 | (120) | -.004 | (123) |
| Integrative | -.225** | (120) | -.208* | (123) |
| Self-Definition | -.081 | (120) | -.173* | (123) |
| Achievement Motive | -.053 | (120) | -.051 | (123) |
| Affiliation Motive | -.060 | (120) | -.037 | (123) |
| Power Motive | .017 | (120) | .028 | (123) |
| Learning Style Inventory | | | | |
| Concrete Experience | .105 | (124) | .124 | (126) |
| Reflective Observation | .183* | (124) | -.250** | (126) |
| Abstract Conceptualization | -.037 | (124) | -.141 | (126) |
| Active Experimentation | -.012 | (124) | .124 | (126) |
| Abstract/Concrete Learning Orientation | -.083 | (124) | -.164 | (126) |
| Active/Reflective Learning Orientation | .106 | (124) | .222** | (126) |

Table 1. continued

| Human Potential Measures at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | | Six Performance Characteristic Factor: Three and One-Half Years After Entrance | |
|---|---|---|---|---|
| Test of Thematic Analysis | -.141 | (122) | -.079 | (125) |
| Critical Thinking Appraisal | | | | |
| Inference | .138 | (115) | .101 | (118) |
| Recognition | .187 | (115) | .105 | (118) |
| Deduction | .113 | (115) | -.041 | (118) |

*p < .05
**p < .01

Note: Numbers in parentheses are sample sizes.

APPENDIX F Table 2.

Simple Correlations Between Second Assessment on the Measures of Human Potential and the Six Performance Characteristics Rating Factor

| Human Potential Measure at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | Three and One-Half Years After Entrance |
|---|---|---|
| Measures of Vocational, Educational and Personal Issues | | |
| "Best Class" Essay | .232** (120) | .195* (123) |
| "Decision" Essay | .109 (121) | .147 (124) |
| "Career" Essay | .186* (120) | .082 (123) |
| Sentence Completion Test | .281***(120) | .181* (123) |
| Defining Issues Test | | |
| P% Score | .225** (106) | .258** (110) |
| D Score | .163* (106) | .288***(110) |
| Test of Cognitive Development | .218** (118) | .312***(121) |
| Picture Story Exercise | | |
| Receptive | -.332***(120) | .103 (123) |
| Autonomous | .053 (120) | .193* (123) |
| Assertive | .188* (120) | .204* (123) |
| Integrative | .051 (120) | -.031 (123) |
| Self-Definition | -.068 (120) | -.138 (123) |
| Achievement Motive | -.024 (120) | .012 (123) |
| Affiliation Motive | .011 (120) | -.140 (123) |
| Power Motive | .090 (120) | .091 (123) |
| Learning Style Inventory | | |
| Concrete Experience | -.080 (124) | -.048 (126) |
| Reflective Observation | -.127 (124) | -.258** (126) |
| Abstract Conceptualization | .089 (124) | .022 (126) |
| Active Experimentation | .036 (124) | .132 (126) |
| Abstract/Concrete Learning Orientation | .096 (124) | .038 (126) |
| Active/Reflective Learning Orientation | .093 (124) | .223** (126) |

Table 2. continued

| Human Potential Measures at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | | Six Performance Characteristic Factor: Three and One-Half Years After Entrance | |
|---|---|---|---|---|
| Test of Thematic Analysis | -.003 | (122) | -.044 | (125) |
| Critical Thinking Appraisal | | | | |
| Inference | .140 | (115) | .111 | (118) |
| Recognition | .212* | (115) | .170* | (118) |
| Deduction | .304*** | (115) | | (118) |

*P < .05
**P < .01
***P < .001

Note: Numbers in parentheses are sample sizes.

APPENDIX F Table 3.

Simple Correlations Between Third Assessment on the Measures of Human Potential and the Six Performance Characteristics Rating Factor

| Human Potential Measure at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | Six Performance Characteristic Factor: Three and One-Half Years After Entrance |
|---|---|---|
| Measures of Vocational, Educational and Personal Issues | | |
| "Best Class" Essay | .243** (121) | .137 (124) |
| "Decision" Essay | .370***(120) | .363***(123) |
| "Career" Essay | .253** (121) | .218** (124) |
| Sentence Completion Test | .212** (120) | .092 (123) |
| Defining Issues Test | | |
| P% Score | .361***(102) | .290***(105) |
| D Score | .326***(102) | .282** (105) |
| Test of Cognitive Development | .215** (118) | .195* (121) |
| Picture Story Exercise | | |
| Receptive | .034 (119) | .005 (122) |
| Autonomous | -.084 (119) | -.097 (122) |
| Assertive | .021 (119) | -.089 (122) |
| Integrative | .092 (119) | .040 (122) |
| Self-Definition | .017 (120) | -.022 (123) |
| Achievement Motive | .063 (120) | .096 (123) |
| Affiliation Motive | -.118 (120) | -.268***(123) |
| Power Motive | -.016 (120) | .055 (123) |
| Learning Style Inventory | | |
| Concrete Experience | -.019 (124) | -.053 (126) |
| Reflective Observation | -.079 (124) | -.199 (126) |
| Abstract Conceptualization | .105 (124) | .161* (126) |
| Active Experimentation | -.093 (124) | -.031 (126) |
| Abstract/Concrete Learning Orientation | .076 (124) | .127 (126) |
| Active/Reflective Learning Orientation | -.002 (124) | .104 (126) |

Table 3. continued

| Human Potential Measures at Entrance | Six Performance Characteristic Factor: Two and One-Half Years After Entrance | Six Performance Characteristic Factor: Three and One-Half Years After Entrance |
|---|---|---|
| Test of Thematic Analysis | .103 (122) | .105 (125) |
| Critical Thinking Appraisal | | |
| Inference | .216** (115) | .124 (118) |
| Recognition | .276***(115) | .143 (118) |
| Deduction | .260** (115) | .103 (118) |

*P < .05
**P < .01
***P < .001

Note: Numbers in parentheses are sample sizes.


3401 South 39th Street / Milwaukee, WI 53215