

## Selected Factors of Teaching Effectiveness: Perceptions of Apprenticeship Trainers

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It is theoretically impossible to measure a teacher's effectiveness by measuring only student achievement (Biddle & Ellana, 1964; Medley, Coker, & Soar, 1984). There is no scientific method of separating what and how much a pupil learned from the teacher, due to all other extraneous list of traits attributed to the teacher (Sikora, 1997).

Kindsvatter, Wilen, and Ishler (1988) addressed seven assumptions and beliefs basic to effective teaching:

- The quality of teaching is directly contingent upon the quality of the decision making that precedes that teaching.
- Teaching is a complex behavior.
- Teaching is a learned behavior.
- Instruction should be based on the most effective strategies, methods, techniques, and behaviors as determined by current research and learning.
- Students must be motivated.
- The social settings in which instruction occurs is a major factor affecting that instruction.
- Teaching in the final analysis is a personal invention.

The results of teaching have been studied in terms of student achievement, adjustment, attitudes, socioeconomic status, and creativity (Nwagwu, 1998). Despite all these activities, no studies have examined the factors underlying teaching effectiveness as perceived by apprenticeship trainers.

Under a proposed five-year strategic plan for the new federal workforce development law, the U.S. Department of Labor aims to increase by 10% the total number of registered apprentices and the number of women in such programs. The plan, which outlines the department's vision for the 1998 Workforce Investment Act (WIA) from 1999 to 2004, proposes to increase the number of individuals in registered apprenticeship

programs from 415,262 to 458,482 over five years. It also targets to increase by 10% (from 8,748 to 9,897) the number of women in such programs by 2004 (Dembicki, 1999).

The current emphasis on educational reform in our nation's schools should be forcing us to examine the underlying factors of teaching effectiveness. As work and technology issues increase, apprenticeship trainers must be effective in preparing apprentices for their future roles in selected allied trades (e.g., industrial painting, wall covering, dry-wall finishing floor covering, glazing, sign painting).

### What We Sought to Do

The following objectives guided this investigation:

- To identify factors underlying apprenticeship trainers' perceptions of teaching effectiveness.
- To describe the level of importance of teaching effectiveness as perceived by apprenticeship trainers.
- To determine if significant differences existed in mean scores among four groups of apprenticeship trainers' perceptions toward selected factors of teaching effectiveness.
- To compare perceived level of teaching effectiveness of apprenticeship trainers by age groups.

### How We Proceeded

The target population was apprenticeship trainers of allied trades from all 50 states and Canada. The accessible population for this exploratory study consisted of apprenticeship trainers ( $N = 306$ ) who attended the annual International Union of Painters and Allied Trades (IUPAT) four-day seminar at Marshall Community and Technical College during the summer of 1999. A registration list of the four-day event was obtained from Marshall Community and

Technical College and served as the frame for the study. The apprentice trainers who comprised the population of the study were operationally defined as prospective trainers of trainers.

According to Krejcie and Morgan (1970), a sample size of 169 is needed to represent a population of 306 when a simple random sample is drawn. However, Tatsuoka (1982) cautioned that when stratified samples are used rather than simple random samples, smaller samples should be drawn to more accurately represent the population because the design effect is less than one for stratified samples. Therefore, the sample size recommended by Krejcie and Morgan was reduced from 169 to 150 and was drawn as a proportionally stratified sample composed of 48 first-year apprenticeship trainers, 45 second-year apprenticeship trainers, 30 third-year apprenticeship trainers, and 27 fourth-year apprenticeship trainers.

A two-part questionnaire was developed by the researcher. The first part of the instrument asked participants to determine their perceptions of teaching effectiveness.

A 5-point Likert-type scale was used (1 = *not applicable*, 2 = *unimportant*, 3 = *important*, 4 = *very important*, and 5 = *essential*). Muller (1986) stated that using a scale with a middle category seems to work as well as a scale without a middle category. The second part of the instrument asked participants to provide pertinent demographic information.

Content and face validity for the instrument were established by a panel of experts consisting of university faculty, community college administrators, and business and industry personnel. Fourteen purposely selected adult and technical education graduate students served to establish reliability of the ques-

tionnaire. The resulting Cronbach's alpha reliability coefficient for internal consistency was .8817.

The instrument was administered by the coordinator of the seminar on the third day of this four-day event. However, this time period of administration proved to be less than ideal as indicated by a return rate of only 53% (79) usable questionnaires. Caution is warranted in generalizing the results beyond the accessible sample.

### What We Learned and What It Tells Us

Data were analyzed with the SPSS for Windows computer program. Appropriate statistics for description were used including frequencies, percentages, means, and standard deviations.

Factor analysis (principal components with varimax rotation) was used to identify factors underlying apprenticeship trainers' perceptions of teaching effectiveness. Procedures for conducting the factor analysis were patterned after those of McCaslin and Torres (1992). Analysis of variance was used to test for significant differences among the subsamples of apprenticeship trainers on their perceived factors of teaching effectiveness. When significant differences were observed, the Duncan's multiple range test was used to identify where differences existed.

The data on apprenticeship trainers indicated that a majority (89.9%) of the respondents were male, 10.1% were female. This finding is supported by data reported by Dembicki (1999). According to Dembicki, the U.S. Department of Labor aims to increase by 10% the total number of women participating in apprenticeship-related areas.

The characteristics collected from apprenticeship trainers also revealed that over 30% fell within the 35 and 45 age brackets. In addressing the educational level, almost two thirds (62.0%) of the apprenticeship trainers reported having completed college credits beyond the

high school level. Apprenticeship trainers reported an average of 16.26 years of employment ( $SD = 9.54$ ) in their current or most recent occupation.

To discern whether there was clustering among the items, the ratings of respondents were subjected to factor analysis (principal components with varimax rotation). The analysis resolved the 51 items into 10 factors including a dominant one that accounted for over two fifths of the total variance explained. A factor is a set of individual questionnaire items that coalesce into an entity on the basis of their intercorrelation, presumably on the basis of their conceptual similarity.

The 10 factors accounted for 70.7% of the total variance. Factor loadings ranged from .51 to .81. According to Hair, Anderson, Tatham, and Black (1998), loadings of .30 are to be considered significant; loadings of .40, more significant; and loadings over .50, very significant. As indicated above, it is presumed that factors are held together by an underlying theme or concept. This underlying theme provides a basis for their naming. In order of percentage of variance explained, the 10 factors in this solution were named as follows: faculty-student interaction, classroom management, professional development, enthusiasm, students participate in evaluation, socialize with students, procedures and policies, positive individual attention, communication and feedback, and atmosphere for respect.

Examination of the faculty-student interaction factor indicated that it was dominant, explaining 29.7% of the variance. It was also revealed that the items in this factor, for the most part, refer to a process of encouragement and involvement of students in learning activities. In the survey of people nominated for the 1999 All-USA Teacher Team, respondents reported that interaction with students and influence of students' lives ranked highest among items that teachers found to be rewarding about their jobs (DeBarros, 1999).

The remaining nine factors each explained relatively small amounts of variance. The atmosphere for respect factor was comprised of a single questionnaire item. In a strict sense, a single item cannot constitute a factor. However, "respect" for apprenticeship trainers must in this context be taken as a special case—an important outlier. The fact that it did not correlate with other questionnaire items did not diminish its value. Indeed, this item had a factor loading of .79, *very significant*, and virtually the highest among the 51 questionnaire items. DeBarros (1999) reported that, in general, students respect teachers.

Apprenticeship trainers agreed that it was *very important* ( $M = 4.50$ ,  $SD = 0.73$ ) for instructors to be at all scheduled classes. Respondents were more likely to agree that it was unimportant ( $M = 2.65$ ,  $SD = 0.98$ ) for students to assist in composing test questions. Almost three fourths (72.54%) of the items were reported as important ( $M = 3.01$ -3.97) by respondents in this study.

Significant differences were observed among means on 6 of the 10 factors of teaching effectiveness. Duncan's multiple comparison test was used to determine the nature of difference among the four groups of apprenticeship trainers. This analysis revealed that first-year apprenticeship trainers were significantly different from fourth-year and third-year apprenticeship trainers on the faculty-student interaction factor. The data also revealed that first-year apprenticeship trainers were significantly different from third-year and fourth-year apprenticeship trainers on the communication and feedback factor. Second-year apprenticeship trainers also reported a similar pattern for the communication and feedback factor. Communication and feedback are essential tools for helping students understand cognitively what they are doing, what they should and should not be doing, and what adjustments should be made (Rink, 1993).

Apprenticeship trainers from the four different groups did not differ significantly on the following four factors: pro-

professional development services, participation of students in the evaluation process, socialize with students, and atmosphere for respect.

Significant differences were observed among means on 5 of the 10 factors (classroom management, explanation of procedures and policies, professional development, communication and feedback, and atmosphere for respect) of teaching effectiveness by age groups.

Apprenticeship trainers within the 35 to 44 age bracket were significantly different ( $M = 22.67$ ,  $SD = 4.05$ ) from apprenticeship trainers in the 45 to 54 age group ( $M = 24.77$ ,  $SD = 3.25$ ) on the classroom management factor. This finding suggests that apprenticeship trainers within the 45 to 54 age bracket were more likely to have higher mean ratings for classroom management. This finding can probably be attributed to experience within the apprenticeship industry.

The data revealed that apprenticeship trainers who fell within the 25 to 34 age group were less likely to have high mean ratings for the 10 factors of teaching effectiveness when compared with the other age groups.

Based on the results of this study, the typical apprenticeship trainer in this study (a) was more likely to be a male, (b) was more likely to be in the age bracket of 35 to 54 years old, (c) had completed some college credit hours, and (d) had completed an average of 16 years of employment in current or most recent occupation.

In this study, apprenticeship trainers were more likely to report the following statements as *very important* for teaching effectiveness:

- Be at all scheduled classes.
- Be fair and impartial in dealing with

requests.

- Show enthusiasm for students and subject matter.
- Listen to students' opinions and comments.
- Be specific about acceptable and unacceptable behavior.
- At the beginning of class(es), state topics and objectives.
- Give appropriate and considerate responses to questions.

These findings illustrate the importance of these statements as measuring indicators of teaching effectiveness for apprenticeship trainers.

Third- and fourth-year apprenticeship trainers were more likely to report higher mean ratings for the 10 perceived factors of teaching effectiveness when compared to first- and second-year apprenticeship trainers. This finding can probably be attributed to the amount of in-service training completed by third- and fourth-year apprenticeship trainers.

The following perceived factors of teaching effectiveness were highly significant among the four groups of apprenticeship trainers: communication and feedback, faculty-student interaction, and explanation of policies and procedures. The data seem to suggest that communication and feedback, faculty-student interaction, and explanation of policies and procedures are essential factors for assessing teaching effectiveness of apprenticeship trainers. Overall, younger apprenticeship trainers appeared to be less aware of the essential factors of teaching effectiveness.

The following implications and recommendations are offered:

There was not a representative sample of female apprenticeship trainers in this study. This implies that there is a need to recruit and retain more female

apprenticeship trainers. To increase participation, apprenticeship agencies should develop and circulate awareness and education materials to community-based organizations.

Apprenticeship trainers rated almost three fourths of the 51 items as *important* for an instructor to practice. This finding suggests that apprenticeship trainers value a majority of these selected measures of teaching effectiveness as essential for evaluation and assessment of apprenticeship trainers.

First- and second-year apprenticeship trainers were more likely to report low mean ratings for the 10 perceived factors of teaching effectiveness. This probably implies that these two groups have not received sufficient training in the area of teaching effectiveness. Preservice training should therefore be made available to prospective apprenticeship trainers in the area of teaching effectiveness. Mentoring should be provided for incoming and younger apprenticeship trainers.

Research should be conducted to determine the relationship between teaching styles and teaching effectiveness of apprenticeship trainers.

Improving teaching effectiveness is not merely a function of effective reward system, but rather a collaborative function of several factors working together to improve not only what goes on in the classroom but to improve quality of faculty. Apprenticeship trainers must learn a body of knowledge essential for teaching, how to prepare for instruction, and how to deliver instruction to become effective.

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