ABSTRACT
                This project was undertaken to develop and validate a
pupil response instrument for evaluating the instructional competence
of aspiring teachers. Two school districts of moderate size and in
close proximity to a university were selected for the project. The
sample consisted of the pupils of 96 secondary area teacher
candidates completing the student teaching requirement for a teaching
certificate during the 1974-75 academic year. An instrument of 55
items was devised in which the pupils responded to each item on a
five point scale ranging from agree to disagree. Candidates were
requested to select one class section to complete the instrument near
the end of the program. The resulting data was treated with a variety
of statistical procedures which resulted in the selection of 30 items
grouped into nine different factors. Results indicated, however, that
the instrument could not be validated for students in grades seven
through nine, because the terminology used was too difficult. It was
concluded that pupil assessment of teaching competence adds a
significant dimension to the student teaching program from a
measurement viewpoint. However, because the fear of this practice by
student teachers is great, the use of pupil assessment instruments
for determining competence should be placed in the context of a
formative test of self improvement and not be a final measurement of
the candidates' capabilities to teach. (Tables are included.) (RC)

Pupil Perceptions of

a Student Teacher's Competence

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Paper Prepared for Association of Teacher

Educators Conference

February 4-7, 1976

St. Louis, Mo.

2

The evaluation of a student teacher's competence in instruction, human relations, and curriculum development have traditionally been the province of the classroom and university supervisors.

Principals and university professors are frequently requested to complete recommendations on aspiring teachers. Often these professionals rely on the judgment and observations of the supervisor in phrasing their letters of commendation to potential employers. Although pupils play an instrumental role in determining the degree of success experienced by the teaching candidate, these participants in the instructional process are rarely called on to assess the effectiveness of the teacher on various teaching functions occurring within the classroom.

The practice of collecting and using pupil ratings for evaluating teacher effectiveness has empirical and logical support dating back nearly fifty years. Research on measurement issues of students as evaluators indicate that pupil assessment ratings are as reliable and valid as adult judges, and do not appear to be influenced by the sex of student or teacher, the difficulty of the course, or the course grade awarded (Remmers, 1934, 1963; Veldman and Peck, 1967, Doyle and Whitely, 1974; Frey, Leonard, Beatty, 1975). Further, the Pupil Observation Survey (POSR) developed by Veldman and Peck (1967) produce student ratings related to the grade received in student teaching. This relation suggests similar student teacher evaluations by students and supervisors. This work has been extended and applied by Chissom and Morris (1973) who have incorporated a student response scale in an automated system for evaluating student teacher effectiveness. In this system, pupil evaluations of a teaching

candidate are processed mechanically and placed in the decision struc-
ture for assessing the teaching candidates competence.

Encouraged by the empirical support for pupil evaluation of
teachers, this project was undertaken to develop and validate a pupil
response instrument for evaluating the instructional competence of
aspiring teachers.

Method

This investigation was conducted under aegis of the educational
curriculum and instruction department at a Land Grant University
accredited by the Southern Association of College and Universities
and the National Council for Accreditation of Teacher Education.
Like many other programs, this deparment's culminating activity
for teacher certification is the student teaching experience. Two
school districts moderate in size (ADA, 8478; and 2670) in close
proximity to the University provided the setting for the field experi-
ences for all teaching candidates in this investigation. Both districts
are accredited at the secondary level by the Southern Association of
Colleges and Schools and the Texas Education Agency.

Instrument development was initiated with a review of published
scales of pupil perceptions of teachers. This effort provided potential
topics for an instrument, but questionnaires reviewed were not con-
gruent with the local performance criteria for student teaching to the
degree to warrent their adoption. Therefore, steps were undertaken
to construct a pupil response instrument that was congruent with the
competencies established for the final field experience. Over fifty
items were developed to seek information on the student teacher's
personality, i.e., openness, respect for students, and his technical

skills in: applying questioning strategies, using performance objectives and test construction conventions, planning both daily lessons and units, utilizing text and other instructional materials, and guiding inductive instructional activities.

These items were subsequently reviewed by a panel of judges with criteria emphasizing the relation of the items to program elements and item clarity. After this evaluation, 55 items were organized onto an instrument with directions requesting the pupil to respond to each item on a five point scale ranging from agree to disagree. Further, pupils were directed to place their ratings on an optical scan sheet keyed to each item. At this point, the instrument was ready for field testing.

The sample for this investigation was pupils of 96 secondary area teaching candidates completing the requirements for a teaching certif- icate during the 1974-75 academic year. Specifically, 50 secondary student teachers during the fall term were requested to have pupils in one class section of their student teaching assignment complete an instrument near the conclusion of the experience. Pupils partici- pating in this exercise ranged in education from the seventh through the twelth year. Recommendations from classroom cooperating teachers and student teachers emanating from this trial cautioned the use of the instrument with junior high school pupils (7th-8th grades), because the terminology of the items was too difficult. This council was heeded during the spring semester with administration limited to high school pupils (9th-12th grades). This adjustment resulted in the instrument being completed in 46 classes. As with the fall trial, candidates were requested to select one class section to complete the instrument near the end of the program.

Subsequently, 15 class sets of data from each trial containing 414 pupils (fall) and 368 pupils (spring) were randomly selected from the total samples and submitted to separate statistical analyses. This procedure was undertaken to determine whether the instrument was suitable for administering to junior high students. The assumption for this operation was that if the statistical analyses were to yield similar results the instrument could be administered to junior high as well as senior high pupils.

Two statistical procedures conducted on these respective data sets for item selection purposes were item correlation and factor analysis. Correlation coefficients between performance on a single item and total score on the experimental instrument were computed. Table one (appendix) contains the correlation values and probablility level for each item by trial.

The respective data sets were then factor analyzed by the factor procedure from the statistical analysis system developed by North Carolina State University. This procedure incorporates principal components analysis in determining an appropriate number of factors. A factor matrix is then developed and rotated to orthogonal simple structure using the varimax method of rotation (Barr and Goodnight, 1972). Table 2 (appendix) presents the eigenvalues, and cumulative percent of variance accounted for in each trial. The rotated factor matrix for each trial was examined to determine the largest factor loadings for each item. Table 3 (appendix) provides a summary of items with factor loadings exceeding .30 clustered by factor loading magnitude.

It is apparent after examining tables 1, 2, and 3 collectively that dissimilar results were obtained from the two trials, consequently the collective judgment of the classroom teachers cautioning the use of the

instrument with younger pupils was validated. Based on these results information collected and analyzed from the fall trial played no further role in the instrument's development.

Final item selections were made on the basis of the following criteria. Items were retained because they:

(a)   correlated highly with the total score on the instrument $(p \leqslant .01)$.

(b)   had a rotated factor loading on the factor of .30 or more with little contamination from other factors.

(c)   clustered with other items to form a meaningful factor for assessing teaching performance.

Thirty items resulted from applying these criteria to the data collected during the spring trial.

Results

Analysis I – Although 18 factors (table 2) were identified through the principal components analysis, applying the item selection criteria resulted ultimately in nine factors being adopted. Table 4 (appendix) presents the rotated factor loadings for each selected item. Factor names and descriptions were based on the content of the items clustered under each factor.

Factor I. Probing Inquiry Style of Teaching. A teaching candi-
date with a high score on this factor provides opportunities for critical analysis of issues and information included within the instructional unit. Teaching activities used by this teacher nurture and encourage critical thinking. This factor accounts for 8.46 percent of the variance in the original factor structure.

Factor II. <u>Tolerance for Divergent Behavior</u>. Student teachers with low scores on this factor tend to maintain a tight control over their classes and follow an instructional approach emphasizing factual learning. Factor II represents 9.30 percent of the variance in the original factor structure.

Factor III. <u>Use of Technology in Teaching</u>. Teachers in preparation who are rated high on this factor use a variety of equipment and materials in their teaching. Factor III accounts for 7.16 percent of the variance in the original factor space described by this instrument.

Factor IV. <u>Nature of Class Questions</u>. Student teachers rating high on this factor, tend to rely heavily on the textbook to provide the content and sequence of topics for instruction. This factor represents 5.39 percent of the variance in the original factor structure.

Factor V. <u>Encourages Independent Thinking</u> Teaching candidates with a high score on this factor encourages and supports students who solve different and challenging problems on their own. Factor V accounts for 4.87 percent of the total variance in the orginal factor structure.

Factor VI. <u>Expository Teaching</u> A low score on this factor suggests a student teacher who spends most of the time lecturing from the textbook. Factor VI accounts for 5.37 percent of variance in the factor space described by this instrument.

Factor VII <u>Teacher Led Discussions</u>. Teaching candidates scoring high on this factor use class discussions extensively in presenting information and actively encourages student

participation. This factor represents 6.45 percent of the total variance in the original factor structure.

Factor VIII. <u>Teacher Openness</u>. A high score on this factor reflects a student teacher who is perceived by students as self-confident, friendly, and not affected by the idiosyncracies of some students. The percent of variance this factor accounts for is 5.53.

Factor IX. <u>Respect for Students</u>. Student teachers rated high on this factor are seen by pupils as being interested in their opinions in dialogues occuring both in class and beyond class. Factor IX represents 5.63 percent of the variance in the original factor structure.

Analysis II - Approximate factor mean scores were computed by summing the responses of each pupil in a class over those items assigned to each factor. Product moment correlations were determined between the mean scores and final ratings of the student teaching supervisors and self-report information of the student teacher gleaned from the Purdue Student Teacher Opinionaire (1972). These correlations were made to determine the agreement among various evaluative ratings of student teachers' field experiences. The first Factor, Probing Inquiry Style of Teaching was found to relate to the supervisory ratings of the teaching candidate on questioning skills with correlation values of .69 and .40 for university and classroom supervisors, respectively. A second university supervisor evaluation reflecting a high correlation, .75, with this factor was the utilization of unit plans rating.

The second Factor, Tolerance for Divergent Behaviors, was found to yield negative correlations namely -.65 and -.71 with the "rapport

with supervising teacher score" and "teaching as a profession score" of the Purdue Student Teacher Opinionaire. The relation of Facor III, Use of Technology in Teaching, with supervisor ratings of the student teacher's ability to use audio-visual equipment and materials were determined to be -.46 for the classroom supervisor, and -.28 for the university supervisor. Converse to the negative correlations of Factors II and III with self-report and supervisor ratings Factor IV dealing with the types of questions posed in class correlated positively with supervisor ratings on questioning skills, namely .83 for university supervisors and .52 for classroom supervisors.

The fifth Factor entitled, Encourages Independent Thinking, was found to correlate substantially, .59, with the "rapport-with-students score" of the Purdue Student Teacher Opinionaire. In contrast Factor VI, Expository Teaching, was determined to be inversely related to university supervisor ratings of the student teacher's use of positive reinforcement,-.63, and use of performace objectives, -.60.

Factor VII, Teacher Led Discussions, relates to both supervisors' ratings on the questioning skills that is, .53 (university) and .63 (class room), and to a pair of scores on the teaching candidates self-report instrument namely, rapport-with-students (.62) and professional preparation (.58). The correlation coefficient for Factor VIII, Teacher Openness, was found to relate substantially to university supervisor ratings on the student's use of positive reinforcement, .84. The last Factor entitled, Respect for Students, was determined to relate with one rating of the classroom supervisors, i.e., handling of discipline problems (.69), and two self-report scores from the Purdue Student Teacher Opinionaire, namely, professional preparation (.59) and rapport-with-students (.71).

Discussion

The purposes of this project were to develop and validate an instrument which permits secondary pupils to assess various competencies and qualities of a teaching candidate. These goals were accomplished through administrering the original instrument in nearly 100 classes taught by student teachers. The resulting data obtained from these administrations were treated with a variety of statistical procedures which eventually resulted in the selection of 30 items grouped into nine different factors.

Two of these factors namely, teacher openness and respect for student, address student teacher assessment dimensions found in the Pupil Observation Survey (Veldman and Peck, 1967) and the Student Teacher Evaluation Scale (Chissom and Morris, 1973). The generic nature of these two dimensions suggest a basis for explaining the relation of the teacher openness factor and the university supervisors rating on the use of positive reinforcement, and the correlation of the respect-for-students dimension with the classroom supervisors rating of the student teachers' skill in handling discipline problems. These dimensions are global and potentially overlap with several categories stressing human relations and communication skills.

Four of the remaining dimensions of this instrument converge on specific instructional techniques and modes emphasized in the instructional components of the preparatory program. These variables are directly related to presentation procedures, namely, probing inquiry style of teaching, nature of class questions, expository teaching, and teacher led discussions. It is not surprising these factors relate to the supervisor ratings on questioning skills and to some degree the use of positive reinforcement by the student teacher. These dimensions

11

of the pupil response instrument allows a greater discrimination of the types of teacher discourse in class than is possible on the supervisor rating form which contains only one category for teacher questioning skills. However, the relation between these pupil ratings and supervisor ratings do appear to be logical since each rating focuses on some aspect of class presentation by the teacher.

One factor not alluded to previously dealt with the use of technology in teaching. This variable has an analog on the supervisor rating scale, but ironically, inverse correlations resulted when the various supervisor ratings were compared with this factor score. Although it is conjecture, the difference in response set of pupils compared with supervisors on this dimension may be due to the number of observations on which the rating was based. The student ratings surely represent a more comprehensive sample of observations concerning the student teacher's proficiency with technology than the ratings of either supervisor. This is certainly possible if emphasis was placed on demonstrating skill with a movie projector or filmstrip projector on a given lesson and then checked off.

Two other pupil response variables dealing with tolerance and independent thinking were found to be related to subscores on the Purdue Student Teacher Opinionaire. In a sense these variables served as perception checks of the student teachers compared with their pupils.

The development of an instrument to gather pupil perceptions of a student teacher's competence is not without precedence. Both the object and the methodology of this undertaking have been accomplished as noted in the aforementioned investigations. However, the resulting instrument produced from this project differs from these antecedents.

in the following ways.

First, efforts were made to develop a collection of items related to the various skills and techniques stressed in the local preparation program. These efforts were partially realized, especially in the area of presentation skills. Ironically, many of the items developed for assessing unit planning, stating performance objectives, and constructing evaluation instruments failed to cluster together in the factor analysis and were deleted from the instrument. The item clusters that did survive, provide a means of evaluating the type of discourse occurring in the classroom by the collective observations of the pupils.

Second, correlation coefficients determined between the nine variables of the instrument and the rating scales completed by university and classroom supervisors signify notable relation between scales on the instrument and the supervisor rating scale. This is important because pupil ratings will be combined with supervisor ratings in determining the competence of a teaching candidate.

These substantial correlation values also support the work of Doyle and Whitely (1974) and to some degree Veldman and Peck (1967) which suggest that mean scores should be used in making evaluative decisions concerning a teacher. The use of mean scores in this study effectively reduced the sample size from nearly 400 to 15, and reduced the variance of a factor score; however, the mean scores did reduce the bias of individual ratings and added a dimension of stability to the data.

In closing, pupil assessment of teaching competence adds a significant dimension to the student teaching program from a measurement viewpoint. However, the potential for serious reservations and

fear of this practice by student teachers is great. This trepidation

stems from insecurity about the unknown, namely, the classroom

and pupils. For this reason the practice of using pupil assessment

instruments for determining competence should be placed in the

context of a formative test for self improvement and not be a final

measure of the candidates capabilities to teach.

Table 1

Correlation Coefficients Between Performance On

Single Item and Total Score for Fall and Spring Trials

Trial

Item	Fall		Spring	
	R.	Prob.	R.	Prob.
1	.195	.0001	.017	.7430
2	.346	.0001	.354	.0001
3	.057	.2400	.146	.0050
4	.067	.1700	.239	.0001
5	.192	.0001	.226	.0001
6	-.050	.310	.142	.0060
7	.262	.0001	.415	.0001
8	.113	.020	.267	.0001
9	.465	.0001	.362	.0001
10	-.124	.0110	.385	.0001
11	.359	.0001	.368	.0001
12	.219	.0001	.154	.0030
13	.207	.0001	.337	.0001
14	.170	.0005	.160	.0020
15	.097	.0460	.117	.0240
16	.120	.014	.062	.2350
17	.236	.0001	.410	.0001
18	.333	.0001	.330	.0001
19	.364	.0001	.455	.0001
20	.376	.0001	.281	.0001

Table 1

(continued)

Trial

Item	Fall		Spring	
	R.	Prob.	R.	Prob.
21	.296	.0001	.291	.0001
22	.079	.1070	-.091	.0820
23	.166	.0007	.143	.0060
24	.149	.0020	.184	.0004
25	.160	.001	.083	.1110
26	.212	.0001	.175	.0008
27	.180	.0002	-.040	.4450
28	.190	.0001	.235	.0001
29	.111	.020	.160	.0020
30	.360	.0001	.299	.0001
31	.137	.0050	.138	.0080
32	.277	.0001	.348	.0001
33	.362	.0001	.391	.0001
34	.424	.0001	.302	.0001
35	.497	.0001	.382	.0001
36	.530	.0001	.413	.0001
37	.464	.0001	.385	.0001
38	.037	.447	.034	.5190
39	.357	.0001	.269	.0001
40	.101	.040	-.014	.7940

Table 1

(continued)

Trial

Item	Fall		Spring	
	R.	Prob.	R.	Prob.
41	.525	.0001	.381	.0001
42	.166	.0007	.264	.0001
43	.434	.0001	.379	.0001
44	.404	.0001	.353	.0001
45	.626	.0001	.434	.0001
46	.513	.0001	-.347	.0001
47	.283	.0001	.365	.0001
48	.386	.0001	-.001	.9840
49	.436	.0001	.2880	.0001
50	.369	.0001	.099	.0590
51	.494	.0001	.397	.0001
52	.578	.0001	.392	.0001
53	.470	.0001	.344	.0001
54	.492	.0001	.294	.0001
55	.336	.0001	.325	.0001

Table 2

Principal Components, Eigenvalues and Cumulative Percent

of Variance for Each Trial

Principal Components	Fall Trial		Spring Trial	
	Eigenvalues	Cumulative % of Variance	Eigenvalues	Cumulative % of Variance
1	6.679	12.14	6.283	11.42
2	4.444	20.22	4.216	19.09
3	2.403	24.59	2.579	23.78
4	2.144	28.49	1.992	27.40
5	1.702	31.59	1.638	30.38
6	1.674	34.63	1.567	33.23
7	1.521	37.39	1.426	35.82
8	1.401	39.94	1.349	38.28
9	1.379	42.45	1.315	40.67
10	1.271	44.76	1.287	43.01
11	1.256	47.04	1.231	45.25
12	1.185	49.20	1.207	47.44
13	1.142	51.28	1.154	49.54
14	1.049	53.18	1.119	51.57
15	1.039	55.07	1.064	53.51
16	1.002	56.89	1.048	55.41
17	-0-	-0-	1.034	57.29
18	-0-	-0-	1.020	59.15

18

Table 3

Items Clustered by Factor with Rotated Loadings Greater than .30

Factor	Fall Trial	Spring Trial
F1	9, 11, 19, 20, 21, 34, 35, 36, 37, 39, 41, 43, 44, 45, 46, 48, 49, 51, 52, 53, 54	7, 17, 19, 24
F2	16, 24, 25, 26, 27, 28, 47	41, 46, 50, 51, 52, 54
F3	10, 12, 40, 42, 50	9, 45, 53
F4	1, 3, 32, 33	5, 15
F5	38	3, 6, 26
F6	2, 7, 17	16, 27
F7	23, 29	38, 40
F8	13	32, 33, 42
F9	6, 15, 22	28, 30, 34, 36, 43
F10	31	1, 2, 22
F11	14, 30	12, 13
F12	55	14, 23, 19
F13	4, 18	31
F14	-	10
F15	8	29, 39, 55
F16	5	8, 11
F17	-	25
F18	-	37, 48

Table 4

Items with Rotated Factor Loadings above .30

Original Item	Item	I	II	III	IV	V	VI	VII	VIII	IX
7.	We often discuss the kind of evidence that is behind the "truths" presented in this course.	-.60	-	-	-	-	-	-	-	-
17.	When reading the textbook we are expected to look for the main ideas and for the evidence that support and describe them.	-.68	-	-	-	-	-	-	-	-
19.	My teacher encourages differing viewpoints on issues relative to subject matter.	-.53	-	-	-	-	-	-	-	-
24.	We often read subject-related material in books and periodicals outside of class.	-.40	-	-	-	-	-	-	-	-
41.	My teacher frequently discourages rather than encourages student participation during class.	-	.53	-	-	-	-	-	-	-
46.	I do not like to answer discussion questions, because of the teacher's possible negative response if my answer is incorrect.	-	.58	-	-	-	-	-	-	-
51.	My teacher tends to impose unconsciously her/his value system upon us.	-	.70	-	-	-	-	-	-	-
52.	My teacher has a tendency to overemphasize rules and regulations and other rigid school controls.	-	.75	-	-	-	-	-	-	-
54.	My teacher tends to see students not as individuals but as a group or class.	-	.68	-	-	-	-	-	-	-

Table 4

Items with Rotated Factor Loadings above .30

Original Item	Item	I	II	III	IV	V	VI	VII	VIII	IX
32.	The films used in this class are valuable because they supply additional depth to the topic being studied.	-	-	.59	-	-	-	-	-	-
33.	I find the film-loops, filmstrips, and transparencies the teacher uses are helpful aids to understanding the textbook.	-	-	.53	-	-	-	-	-	-
42.	Films, audio-tapes, or some type of audio-visual equipment is used in this class one or more times a week.	-	-	.73	-	-	-	-	-	-
3.	Over 50% of our class time is spent in answering questions that are in the textbooks or in the study guide.	-	-	-	.51	-	-	-	-	-
6.	Most of the questions we ask in class are to clarify what the text or teacher has presented to us.	-	-	-	.49	-	-	-	-	-
26.	Our tests include many questions based upon the unit objectives provided by the teacher at the beginning of the unit.	-	-	-	-.66	-	-	-	-	-
29.	A question on a test that asks you to think up and state ways of looking for solutions to an unfamiliar problem is fair.	-	-	-	-	.43	-	-	-	-
39.	I feel that subject matter can be learned most effectively by letting the student explore and "dig-out" the answers with guidance and direction provided by the teacher.	-	-	-	-	.65	-	-	-	-
55.	My teacher frequently conveys through look, tone of voice, or gesture "high-regard" for students in this class.	-	-	-	-	.51	-	-	-	-

Table 4

Items with Rotated Factor Loadings above .30

Original Item	Item	I	II	III	IV	V	VI	VII	VIII	IX
8.	A large portion of class time is spent listening to our teacher tell us about material.	-	-	-	-	-	-.76	-	-	-
11.	The class discussion are dull because the teacher often repeats almost exactly what the textbook says.	-	-	-	-	-	-.54	-	-	-
28.	Our tests usually ask us to relate ideas that we have learned in different parts of the course.	-	-	-	-	-	-	.51	-	-
30.	The practice of discussing the test results in class the next day is a good learning experience.	-	-	-	-.	-	-	.65	-	-
34.	Teacher led discussions in this class involve about 80% of the class.	-	-	-	-	-	-	.40	-	-
36.	If my teacher maintains eye-contact with me while I am answering a question, I feel she/he is interested in my answer.	-	-	-	-	-	-	.49	-	-
43.	My teacher often uses or entends one of my ideas to explain and clarify the idea or concept.	-	-	-	-	-	-	.31	-	-
9.	My teacher openly admits his mistakes.	-	-	-	-	-	-	-	-.60	-
45.	My teacher is warm and friendly in his class contact with his students.	-	-	-	-	-	-	-	-.58	-
53.	My teacher does not "turn-off" students because they have long hair or unusual tastes in clothing and grooming.	-	-	-	-	-	-	-	-.74	-

Table 4

Items with Rotated Factor Loadings above .30

Orginial Item	Item	I	II	III	IV	V	VI	VII	VIII	IX
37.	My teacher takes time to speak to me outside of class and outside of school, because of this I feel she/he is interested in me as a person.	-	-	-	-	-	-	-	-	-.59
48.	I feel the teacher does respect student answers to discussions, because she/he often refers to these responses in her/his summarizing remarks.	-	-	-	-	-	-	-	-	-.55

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