Predicting Teacher Behavior

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Frequently, teacher workshops begin and/or end with a questionnaire designed to elicit verbal responses to some aspect of the workshop. Since training programs are usually conducted to improve teacher competency, there is an implicit assumption that a relationship exists between how the teacher responds on the survey and what will be done in the classroom as a result of the training experience.

While for many years research emphasis had been primarily on such variables as teacher preferences and teacher attitudes, the 1960's "witnessed this imbalance in (the) process of redress" (Bush, 1967, p. 35). During this "processs of redress", most researchers in teacher education investigated teacher behavior, rather than both teacher attitudes and behavior.

The importance of considering teacher attitudes and behavior is stressed by Berliner (1969), Rubin (1971) and Allen (1971). Berliner (1969) suggests that the measurement of pre-post treatment differences in teacher behavior in a workshop may not be sufficient to indicate whether, in fact, learnings are transferred from training to the classroom, or whether, in fact, the new behaviors are valued components of a repertoire of behaviors.

Most investigations of teacher behavior have been concerned with two dimensions: (1) Establishing relationships between teacher behavior and the characteristics of pupils and/or teachers; and (2) assessing teacher behavior change as the result of a training experience. Few have sought to relate teacher

behavior to teacher attitudes. For example, an examination of Dissertation Abstracts from July, 1967 to March, 1971 yields only twenty studies of the relationship of attitudes to behavior. Only eight of these are in Education, and of these eight, only six are in Teacher Education (Kidd, 1970; Baker, 1969; Vickery, 1967; Barnes, 1970; Beck, 1970; McCall, 1969). Only Vickery (1967) utilized an attitude-behavior theory framework as the basis for his investigation. His study showed that more dogmatic teachers resist evidence that their attitudes and behavior are inconsistent. Most studies have been atheoretical with regard to a conceptualization of attitudes and behavior. Several studies imply attitude-behavior congruence, but measure only behavior or attitudes.

The purpose of this study was two-fold. First, it was an attempt to develop an attitudinal/behavior model, independent of subject matter, which might serve as a general purpose tool for teacher training program evaluation. The second aspect of this study involves the testing of the model by following up a training program for teachers. This study represents an effort to apply a theory which has been refined and tested in social psychology (Fishbein, 1967) to the field of education. Since tests of this theory have a history of successful replication among college students, it is an object of this study to demonstrate its relevance and transferability to the "real world" setting, where the results might have practical as well as theoretical utility. Also, the addition to Fishbein's model (1967) of relevant constructs will be investigated. Therefore, this study tests the attitudinal/behavior model with a sample of teachers who have attended an inservice training program by obtaining the behavior measures in the natural setting of the classroom.

According to Fishbein (1967), an investigation of attitudes and behavior should be concerned with behavioral intentions and beliefs, as well as with attitudes and behavior. In fact, Fishbein (1967) contends that behavioral

intention represents the concept closest to behavior. He has combined attitudes, beliefs, behavioral intention and behavior in a formulation which identifies two determinants of behavioral intention (and, therefore, of overt behavior), attitude toward the act (Aact) and normative beliefs (NB). The formula for the prediction of behavior (B) or of behavioral intention (BI) is:

$$B \approx BI = (Aact)\, w_o + (NB)\, w_1 \quad \text{(Azjen and Fishbein, 1972)}$$

METHOD

Participants and Overview

Approximately 400 teachers of Grades K-6, an average of five teachers from each of 83 schools in a Florida school system, were asked to attend a summer institute for the social studies. The workshops stressed the use of critical thinking skills, value analysis and clarification activities. Nine behaviors, or workshop objectives were identified by this investigator and the county social studies supervisors. The investigator developed a behavior coding scheme to measure teacher questioning behavior, as well as instruments to measure Aact, NB, D, U, and BI. The "attitude" measures were administered at the end of the workshops and teacher behavior was measured when teachers returned to their classrooms. One hundred three (103) teachers taped social studies discussions with their classes. Therefore, the research population is 103 teachers (N=103).[1]

Research Questions and Methodology

The research questions investigated in this study and the methodology utilized to answer them are identified below:

[1] See *items in Table 1 for a definition of the nine behaviors, or workshop objectives, as well as the symbols for additional variables included in this study.

TABLE I

LIST OF ABBREVIATIONS AND SYMBOLS

Aact:	Attitude (affect) toward performing a specific behavior in a given situation.
*AIHPG:	Alternate inferences, hypotheses, predictions and generalizations.
A_o:	Overall favorableness to training program objectives; a general attitude measure.
B:	A specific behavior.
BI:	Intention (Behavioral Intention) to perform a specific behavior in a given situation.
BI:	Overall commitment to training program objectives; a general intention measure.
D:	Perceived difficulty of performing a specific behavior in a given situation.
*EAVJ:	Evaluation and value judgment.
*ETSHAP:	Evidence to support hypotheses and predictions.
*ETSG:	Evidence to support generalizations.
*ETSI:	Evidence to support inferences.
*GBOI:	Generalizations based on inferences.
*HAP:	Hypotheses and predictions.
*IFD:	Inferences from units of data.
MAC:	Mulitple act criterion.
NB:	Normative beliefs about a specific behavior in a given situation; i.e., perception of supervisors' expectations for a specific behavior in a given situation.
*OOUD:	Observations of units of data.
U:	Perceived utility of a specific behavior for attaining objectives in a given situation.

Question 1: What is added to the predictive efficiency of Aact and NB by U (the perceived utility of a specific behavior for attaining objectives), D (the perceived difficulty of performing a behavior) and GT (the grade taught) in the prediction of behavioral intention (BI)?

The following models were tested to answer this questions:

Model (1): $BI = a_1\ Aact + a_2\ NB + a_3\ U + a_4\ D + a_5\ GT$

Model (2): $BI = a_1\ Aact + a_2\ NB$

Model (1) is an estension of Fishbein's basic model (Model 2) in which on Aact and NB are used as predictors of behavioral intention.

Multiple regression was used to test Models 1 and 2. The F ratio was calculated from the difference in R^2 between the "full" model, containing all predictor information, and the "reduced" model, containing only Aact and NB. The procedure used was to drop predictors 3-5 from the "full" model, compare the difference between the two models in the obtained R^2 and P value of the F ratio.

Question 2: Is teacher behavior (B) a partial function of the perceived difficulty (D) of performing the behavior?

Canonical correlation was used to test the relationship of two data sets, Set A (Behavior items) and Set B (Difficulty items). The obtained canonical correlation was examined in relation to the redundancy of the left set given the right set, and the right set given the left set.

Question 3: Is the prediction of teacher behavior improved when teachers are grouped by their obtained level of commitment (ΣBI) scores over that which is obtained when ΣBI is included as a predictor for the total research sample? Specifically, is the prediction of a multiple act criterion of teacher behavior (MAC) by a general attitude measure (A_o) improved when teachers are grouped into High, Medium and Low Commitment Groups over that which is obtained when ΣBI and A_o are used as predictors for the total research sample?

Multiple regression was used to answer question #3. The information of primary interest was R^2. The R^2's obtained when the multiple correlations between MAC, A_o and ΣBI were computed for each of the Commitment Groups were compared with the R^2 obtained when ΣBI and A_o were used as predictors for the total research sample.

Question 4: Are single act teacher behaviors (B) better predicted by (correlated more highly with) an approprate behavioral intention (BI) measure than by a general attitude (A_o) measure or Σ BI?

Pearson product moment correlations were computed between each single act teacher behavior and its corresponding BI, each single act teacher behavior and A_o, and each single act teacher behavior and Σ BI.

RESULTS

Question 1:

The regression procedure used to answer question 1 was to drop U, D and GT collectively and compare the reduced model (Model 2) to the full model (Model 1) in omnibus F tests. This procedure was repeated for each of the nine behavioral intentions. The results of these analyses are presented in Table 2.

Table 2

Results of Omnibus F Tests
(N=103)

	Aact	NB	U	D	GT	R	R^2	R^2Diff.
OOUD	IN	IN	IN	IN	IN	.316	.100	
	IN	IN	OUT	OUT	OUT	.154	.024	.076
IFD	IN	IN	IN	IN	IN	.181	.033	
	IN	IN	OUT	OUT	OUT	.062	.004	.029
ETSI	IN	IN	IN	IN	IN	.317	.100	
	IN	IN	OUT	OUT	OUT	.229	.053	.048
HAP	IN	IN	IN	IN	IN	.328	.107	
	IN	IN	OUT	OUT	OUT	.303	.092	.016
ETSHAP	IN	IN	IN	IN	IN	.640	.410	
	IN	IN	OUT	OUT	OUT	.589	.347	.063
GBOI	IN	IN	IN	IN	IN	.372	.138	
	IN	IN	OUT	OUT	OUT	.277	.077	.061
ETSG	IN	IN	IN	IN	IN	.387	.155	
	IN	IN	OUT	OUT	OUT	.074	.005	.145*
AIHPG	IN	IN	IN	IN	IN	.406	.165	
	IN	IN	OUT	OUT	OUT	.358	.128	.037
EAVJ	IN	IN	IN	IN	IN	.286	.082	
	IN	IN	OUT	OUT	OUT	.228	.052	.030

* Significant at P < .05

Question 2:

A canonical analysis was performed to consider the two data sets. The first set, Set A, contained the nine B items; the second set, Set B, contained the nine D items. Table 3 presents the canonical correlations associated with each of the nine roots in the canonical analysis. The first root, with a canonical R of .549, is significant at $P < .05$.

Table 3

Canonical Correlations Between Set A and Set B
(N = 103)

Root	Cannon. R	Cannon. R^2	D.F.	Chi. Sq.	P
1	.549	.301	17	33.113	.025*
2	.502	.252	15	26.875	.062
3	.447	.200	13	20.610	.152
4	.394	.155	11	15.636	.271
5	.331	.109	9	10.711	.531
6	.277	.077	7	7.391	.598
7	.182	.033	5	3.117	.874
8	.168	.028	3	2.650	.756
9	.058	.003	1	.315	.956

* P = < .05

Question 3:

This question asks if prediction of a multiple act criterion (MAC) of teacher by a general attitude measure (A_o) and ΣBI is improved when teachers are grouped into High, Medium and Low Commitment Groups over that which is obtained when Σ BI and A_o are used as predictors for the total research sample.

Table 4 presents the results of the regression procedure to determine the predictive efficiency of ΣBI and A_o. Table 5 shows the correlations between MAC and A_o for the total research sample and for each of the commitment groups.

Table 4

Regression Results For
$MAC = \beta\Sigma BI + \beta\Sigma A_o$

Total Sample (N=103)			
$\beta\Sigma BI$	βA_o	R	R^2
.478	.094	.522	.273
HC (N=24)			
$\beta\Sigma BI$	βA_o	R	R^2
.118	.099	.168	.028
MC (N=57)			
$\beta\Sigma BI$	βA_o	R	R^2
.063	.076	.107	.011
LC (N=22)			
$\beta\Sigma BI$	βA_o	R	R^2
.226	-.033	.216	.047

Table 5
Correlations of MAC and A_o

Total Sample (N = 103)	HC (N = 24)	MC (N = 57)	LC (N = 22)
.283	.123	.087	.046

Question 4:

The analysis to answer this question constitutes the major test of the theory in this study. Table 6 presents the correlations between each B and its corresponding BI, and each B, A_o and ΣBI. An examination of Table 6 shows that each single act criterion (B) is better predicted by a general behavioral intention measure (ΣBI) than by a general attitude measure (A_o). Further, the range of correlations for B and its corresponding BI is .54 to .68. In addition, the lowest B/BI correlation obtained (GBOI= .537) is higher than the highest correlation obtained in either the B/A_o or B/Σ BI comparison.

Table 6

Correlations of B with A_o, ΣBI, BI
(N = 103)

B	A_o	ΣBI	BI
OOUD	.224	.233	.680
IFD	.283	.359	.608
ETSI	.294	.319	.565
HAP	.053	.285	.610
ETSHAP	.059	.309	.575
GBOI	.027	.076	.537
ETSG	.076	.251	.598
AIHPG	.135	.322	.603
EAVJ	.229	.353	.668

DICUSSION

Question 1:

Table 2 shows that for only one behavioral intention, ETSG (see Table 1), did the predictor group (U, D and GT) contribute significantly to the prediction of behavioral intention. This tends to support Fishbein's (1967) contention that respondents consider variables about which they have knowledge in responding to BI, Aact and NB. Also, the range of the R^2's for the nine full models is only .033 to .410, and for the reduced models, .004 to .347.

It should also be noted that for only behavior, ETSHAP, a multiple correlation (R) of more than .50 was obtained between BI and Aact and NB (R = .589). In other words, BI is shown to be a strong function of Aact and NB for only one of the nine behaviors measured in this study.

Question 2:

Love and Stewart (1968) have suggested that a strong canonical correlation may be obtained between two functions, although these functions may extract only a small portion of variance from the respective data sets. Therefore, they calculated R, an index of the proportion of variance of Set A predictable from (or redundant with) Set B. The proportion of variance of Set B predictable from Set A can be calculated from by reversing the sets and finding R to determine the contribution of each of the variables in Sets A and B to the redundancy. In other words, interpretation of the Canonical R needs to be made in consideration of how much variance R represents for the two data sets. For the canonical correlations shown in Table 3, the redundancy of the behavior items (Set A) given the difficulty items (Set B) is only 13.4%. The redundancy in Set B given Set A is only 12.8%. Although the results indicate that there is some predictive validity in Set A relative to Set B (and conversely), a strong relationship does not exist between a teacher's behavior and his/her perception of the dificulty of performing the behavior.

Question 3:

The results of the analysis indicate that prediction of teacher behavior (MAC) is not improved when teachers are grouped by their overall commitment to workshop objectives. While the multiple correlation of A_o and ΣBI with MAC is .522 (and R^2 = .273) for the total research sample, multiple correlations obtained for each of the commitment groups are much lower (R .107 to .216; R^2 = .011 to .047). Further, while a correlation of .273 ($P < .01$) between MAC and A_o was obtained for the total research sample, obtained correlations for the commitment groups were all lower.

Question 4:

In five studies utilizing Fishbein's theoretical model (Azjen and Fishbein, 1970; Azjen, 1971; Hornick, 1970; Darrock, 1971; Fishbein, Azjen, Landy and Anderson, 1970), the range of obtained B/BI correlations was reported to be .211 to .970. All five studies assessed B and BI close in time. None assessed B in the natural behavior setting, in which feedback is possible after the performance of the behavior. Therefore, the correlations for B/BI in this study are considered to be very high because of the length of time between B/BI assessment (about seven weeks), the complex nature of the behaviors, the fact that the behavior data was collected in a natural setting in which it was not possible to assure complete homogeneity of events, and performance of each of the behaviors by the teachers involved feedback on the behaviors from children.

Therefore, the best predictor of a single act criterion (of a behavior, B) is, as Fishbein (1967) contends, its corresponding behavioral intention measure.

The success of the behavioral intention measure in predicting overt teacher behavior indicates that a method is available for measuring the transfer of training from a teacher workshop to the classroom (or from a training environment to a performance environment). In addition, the behavioral

intention score may be used to plan follow-up training sessions. Further, future research utilizing the variables in this study should also represent a test of the theory (Fishbein, 1967; Mitchell, 1973), since better communication of research findings within the research community results if the theoretical framework of the investigation is explicitly stated and if the research attempts to validate a model which has already been tested and replicated.

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