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ABSTRACT

The purpose of this study was to examine the factor structure stability of the Student Evaluation of College Teaching Behaviors (SECTB), a 60-item, low inference type of student rating instrument designed to assess college teaching behaviors. While the original factor structure was based on the responses of both faculty and students, including both undergraudate and graduate students across several subject matter fields, the current study focused on 1116 primarily male (74%) freshmen (66%) in one subject matter field (mathematics). Only one factor (currency of knowledge) held up without much change. The results tend to indicate that factor analyses should be obtained for the SECTB and similar low inference item type instruments for each instructional unit and subject matter area within a college. (Author)

Student Evaluation of College Teaching Behaviors (SECTB) Instrument: An Investigation of Factor Structure Stability

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Abstract

The purpose of this study was to examine the factor structure stability of the Student Evaluation of College Teaching Behaviors (SECTB), a 60-item, low inference type of student rating instrument designed to assess college teaching behaviors. While the original factor structure was based on the responses of both faculty and students, including both undergraduate and graduate students across several subject matter fields, the current study focussed on 1116 primarily male (74%) freshmen (66%) in one subject matter field (mathematics). Only one factor (currency of knowledge) held up without much change. The results tend to indicate that factor analyses should be obtained for the SECTB and similar low inference item type instruments for each instructional unit and subject matter area within a college.

Student Evaluation of College Teaching Behaviors (SECTB) Instrument: An Investigation of Factor Structure Stability

The systematic use of student evaluations of college teaching has increased dramatically in recent years. Austin and Lee in 1967 reported only 12.4% of 1100 college and universities using systematic student ratings in all or most departments. Creager (1973), in his study of 669 institutions six years later, found 64.3% using them. One result has been a plethora of student rating forms. Many, perhaps most, of them ask the student to make somewhat global assessments of his instructor's characteristics. That is, most instruments contain high inference type items such as: "How well does the instructor seem to know the subject?" Although such instruments usually have the advantage of short administration time due to a small number of such items, they are often prone to the problems of "response set" and "halo effect."

The Student Evaluation of College Teaching Behaviors (SECTB) was developed as an attempt to deal with the above problems (Greenwood et. al., 1973). It contains 60 low inference items that describe specific teaching behaviors, including both negative and positive type behaviors and asks the student to make a dichotomous choice as to whether or not the item describes the instructor's teaching behavior. The student marks only those items that he considers to be relevant to the course and the instructor.

The SECTB was empirically derived from a large sample of students, faculty and administrators, who were asked to describe the six characteristics of the best and worst college instructors they have known (Bridges et al., 1971). 134 behavioral items were then generated from the categories of characteristics obtained. These were rated by faculty and students in terms of their relationship to good or bad college teaching, and examined by a panel of judges for behavioral specificity. A final pool of 60 items survived and were submitted to factor analysis. Such high agreement was found between students and faculty when their responses were factor analyzed separately, that their responses were pooled into one composite factor analysis yielding eight factors. Table 1 summarizes the original SECTB factor structure (Greenwood et al., 1973).

The purpose of this study was to examine the stability of the SECTB factor structure. The original factor structure was based on the responses of both faculty (n=554) and students (n=328), including both graduate and undergraduate students representing several subject matter fields. This study focused on undergraduates in one subject matter field at the same large southeastern university in which the original study was done.

Method

Subjects

Subjects were 1116 undergraduates enrolled in 38 sections of an undergraduate analytic geometry and calculus course during the fall quarter of

1974. The students were mostly lower division (66% freshmen and 16% sophomores) and male (74%).

Data Collection

The SECTB was administered during the ninth week of a twelve week term. Students were given the usual assurances that instructors would see group data only and then only after the course was over and grades had been turned in. The SECTB was administered by specially trained faculty and students over a two-day period and course instructors were not present at the time.

Analysis and Results

Factor analysis was performed using Gator Education Library programs EEL501 and EEL503 (Guertin and Bailey, 1970). In the case of the data reported here, nine factors were rotated using varimax rotation and the customary eigen value threshold of 1.00.

The rotated factor structure for the data is shown in Table 2. Considerable change in the factor structure is noted when Table 1 is compared with Table 2. Only one factor (Currency of Knowledge) seemed to hold up well, while the original Commitment to Teaching and Evaluation factors seemed to merge with items from some of the original factors. (especially Rapport and Obsolescence of Presentation) and split into two clusters each. The original Facilitation of Learning factor blended into the new Clarity and Organization and Instructor-Student Interaction factors. The original Voice Communication and Openness factors were completely subsumed by new clusters. New factor #8 (Early Communication of Assignments) consists of only one item (#39) with a loading of 0.9121.

Factor I describes an instructor who is not committed to the students he teaches. He not only complains about his teaching assignment and fails to prepare himself for class, but he behaves in a dogmatic and negative manner toward students, communicating his lack of concern for them.

Factor II is descriptive of a well organized instructor who plans ahead, communicates his plans clearly, and presents the subject matter in a clear, understandable manner. He has no problem in dealing with student questions.

Factor III is indicative of an instructor who interacts effectively with his students. He not only encourages student response in the classroom through a variety of stimulating behaviors but he also relates effectively to students outside the classroom.

Factor IV presents an ill-prepared, unmotivated instructor somewhat like the one described in Factor I. However, this instructor seems more bored with teaching itself, perhaps due to non-teaching interests, and does not translate his frustrations into dealing with his students in such a negative manner.

Factor V describes an instructor who deals with his students fairly as far as evaluation procedures are concerned. He gives students advance notice of exams, returns evaluated work promptly, and is willing to discuss and rectify errors made.

Factor VI presents behaviors related to communicating the means of evaluation in the course. The instructor effectively communicates the course objectives and by what means the student is to be evaluated to determine whether or not the objectives have been met. Further, students are able to present their own opinions on objectives and evaluation procedures.

Factor VII is descriptive of an instructor who not only has kept abreast of current publications, research, and ideas in his field but is able to relate the subject matter to personal experiences.

Factor VIII is a one item factor that relates to the early assignment of such course requirements as reports and term papers. Students are told of such work at the beginning of the course so that they will have adequate time to work on it.

Factor IX presents instructor behaviors related to punctuality, not only in coming to class on time but also in keeping outside of class appointments.

Discussion

The purpose of this study was to examine the stability of the factor structure of an instrument with low inference type items when used with an undergraduate (as opposed to a mixture of both graduate and undergraduate) male (74%) popluation in one subject matter field (mathematics as opposed to several subject matter fields). Only one factor (Currency of Knowledge) held up without much change. These findings would seem to argue that if a low inference type instrument is to be used, factor analyses should be obtained for each subject matter field included in a university's student rating program.

It may well be that certain disciplines, especially in the introductory and basic courses, demand highly organized presentations of carefully defined processes or factual information. Mathematics, for instance, does possess a logical structure that many other areas do not possess. The SECTB factor structure emerging from this study differed from the original one in that it seemed to place greater emphasis on instructor planning, organized presentation, and clear and early communication of objectives, assignments and evaluation procedures. It seemed to place less emphasis on such variables as rapport and instructor openness. These two variables may be extremely important in disciplines such as philosophy and humanities in which student ideas, opinions and interpretations are solicited. If factor analyses could be obtained from various fields and at various levels, it may be that different variables could be identified as they relate to the nature of the discipline and the instructional mode the discipline demands.

An issue that might be raised is whether or not the factor structures of high inference item instruments are more stable than those of low inference item instruments. Obviously, research on this issue would be extremely helpful. However, low inference instruments would appear to have greater usefulness as tools for instructional improvement and perhaps the idea of developing separate factor structures for each subject matter field in a college isn't a bad one in any case. College administrators who use student ratings as a basis for making judgments about college teaching effectiveness would do well to encourage research on factor structure stability right along with research on instrument reliability and validity. A different set of factors may emerge for each department (and for each

subject matter area within each department) in a college. It may be found that the uniform use of a student rating instrument throughout an entire college does not make sense.

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Table 1

Factor Arrays of Eight Varimax Factors

Item	Loading	Statement
		Factor I: Facilitation of Learning
3	.562	Gave organized answers to complicated questions in class
9	.558	Permitted students to express opinions which differed from his/her own
12	.526	Encouraged students to ask questions
27	.355	Dealt with student difficulties before they arose
38	.424	Utilized background of students to aid in class activities
51	.570	Encouraged class discussions
54	.509	Explained the reasons for his/her criticisms
56	.395	Delivered orderly, logical presentations of the material
		Factor II: Obsolescence of Presentation
5	.510	Would not deal with questions covering material beyond text
10	.324	Tested primarily for isolated and/or obscure details
25	.352	Presented obsolete material
32	.564	Frequently read aloud from the textbook
36	.327	Presented facts without relating them to one another
40	.616	Class presentations were primarily reiterates of textbook
48	.630	Read extensively from his/her lecture notes
52	.349	Lacked knowledge of subject being presented
59	.334	Presented irrelevant material during lectures
		Factor III: Commitment to Teaching
7	.328	Missed class often due to non-teaching responsibilities
8	.475	Permitted students to disrupt classroom activities

Factor III: Commitment to Teaching (cont.)

Item	Loading	Statement
21	-.503	Spoke with poise
42	-.386	Remained unruffled by student's questions
44	.345	Complained about his/her teaching assignment
45	.607	Was late to class
57	-.555	Came to appointments on time
59	.327	Presented irrelevant material during lectures
		Factor IV: Evaluation
2	.405	Told students what was expected of them
10	-.341	Tested primarily for isolated and/or obscure details
15	.545	Explained how grading was done
16	.310	Provided feedback on student work promptly
33	.330	Established and kept office hours for individual conferences
34	.639	Gave tests which could be completed within the allotted time
37	.349	Gave clear, reasonable assignments
39	.492	Informed students of reports, term papers at the beginning of the course
43	.382	Stated course objectives
53	.734	Stated basis by which grades were determined
55	.608	Announced exams in advance
		Factor V: Voice Communication
4	.634	Changed pitch, volume or quality of speech
18	.799	Could be heard in all parts of the classroom
50	.785	Spoke distinctly
		Factor VI: Openness
24	.410	Listened to student's problems
29	.550	Admitted being wrong when shown he/she was in error
31	.487	Laughed at his/her own mistakes

Item	Loading	Statement
		Factor VII: Currency of Knowledge
5	-.337	Would not deal with questions covering material beyond text
11	.550	Dealt with questions covering material beyond text
13	.685	Introduced new ideas and/or research findings in class
14	.540	Gave references to current publications
19	.318	Presented material as an extension of the text
41	.383	Asked challenging and/or probing questions
43	.378	Stated course objectives
		Factor VIII: Rapport
17	-.391	Ridiculed students in front of class
20	.478	Students could understand professor's vocabulary
22	.538	Students could understand class presentation
24	.340	Listened to student's problems
26	-.451	Ignored student questions
33	.349	Established and kept office hours for individual conferences
47	-.358	Insisted that his/her opinions were the only correct ones
49	.429	Permitted students to complete thought processes
60	.429	Evaluated each student as an individual

Table 2

Factor Arrays of Nine Varimax Factors

Item	Loading	Statement
		Factor I: Lack of Commitment to Students
44	0.7627	Complained about his teaching assignment
47	0.7325	Insisted that his opinions were the only correct ones
35	0.7203	Accepted and/or used inaccurate information
25	0.7009	Presented obsolete material
23	0.6708	Penalized students for disagreeing with teacher
17	0.6443	Ridiculed students in front of class
26	0.6386	Ignored student questions
59	0.6152	Presented irrelevant material during lectures
32	0.5577	Frequently read aloud from the textbook
8	0.5134	Permitted students to disrupt classroom activities
1	0.4283	Admitted lack of knowledge
		Factor II: Clarity and Organization
22	0.6848	Students could understand class presentation
56	0.6689	Delivered orderly, logical presentations of the material
21	0.6116	Spoke with poise
3	0.5844	Gave organized answers to complicated questions in class
50	0.5687	Spoke distinctly
20	0.5439	Students could understand professor's vocabulary
42	0.4612	Remained unruffled by student's questions
37	0.4584	Gave clear, reasonable assignments
27	0.4335	Dealt with student difficulties before they arose
2	0.3677	Told students what he expected of them
34	0.3532	Gave tests which could be completed with the alloted time

Item	Loading	Statement
		Factor III: Instructor - Student Interaction
18	0.5018	Could be heard in all parts of classroom
51	0.5006	Encouraged class discussion
54	0.4638	Explained the reasons for his criticisms
41	0.4624	Asked challenging and/or probing questions
30	0.4529	Talked with students outside of class
12	0.4159	Encouraged students to ask questions
24	0.3957	Listened to student's problems
4	0.3308	Changed pitch, volume or quality of speech
46	0.3059	Lead students to answer own questions
		Factor IV: Lack of Commitment to Teaching
7	0.5291	Missed class often due to non-teaching responsibilities
52	0.5262	Lacked knowledge of subject being presented
38	-0.4642	Utilized background of students to aid in class activities
36	0.4163	Presented facts without relating them to one another
28	0.4083	Showed boredom for teaching this class
48	0.3824	Read extensively from his lecture notes
10	0.3785	Tested primarily for isolated and/or obscure details
49	-0.3652	Permitted students to complete thought processes
60	-0.3087	Evaluated each student as an individual
31	-0.3072	Laughed at his own mistakes
58	0.3007	Made no comment (oral or written) on returned papers
		Factor V: Fairness of Evaluation Procedures
55	0.6748	Announced exams in advance
29	0.6084	Admitted being wrong when shown he was in error
33	0.4336	Established and kept office hours for individual conferences
16	0.3564	Provided feedback on student work promptly

Item	Loading	Statement
		Factor VI: Communication of Evaluation Procedures
15	0.6870	Explained how grading was done
53	0.6624	Stated basis by which grades were determined
43	0.4499	Stated course objectives
9	0.3552	Permitted students to express opinions which differed from his own
		Factor VII: Currency of Knowledge
14	0.5954	Gave references to current publications
13	0.5885	Introduced new ideas and/or research findings in class
11	0.5495	Dealt with questions covering material beyond text
5	-0.4061	Would not deal with questions covering material beyond text
6	0.4061	Called often upon relevant personal experiences in teaching subject
		Factor VIII: Early Communication of Assignments
39	0.9121	Informed students of reports and term papers at the beginning of the course
		Factor IX: Punctuality
57	0.7467	Came to class and appointments on time
45	-0.7364	Was late to class