

Student Evaluation of Teaching Effectiveness (SET): An SEM Study in Higher Education in India

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One of the most used measures for evaluation of teaching quality is teaching effectiveness. Teaching effectiveness (TE) is defined and evaluated in several ways such as teacher's ability to effect personal change and development in their students, their effectiveness in facilitating good academic work in their students and by students rating of their teachers (Shevlin et al, 2000). Increasing attention is being given to measurement of perceived service quality (PSQ) from the university students' perspective (O'Neill & Palmer, 2004; Stodnick & Rogers, 2008). However, this has given rise to various issues such as how to determine the dimensions that form part of the PSQ construct, how to design the quality management model and how to deal with the issues arising from its implementation. It is essential therefore to ascertain the types of attributes that students take into account when assessing quality, and their relative importance (Nath & Zheng, 2004).

There is lack of consensus in literature on what are the characteristics of teaching effectiveness. Further the validity and reliability (psychometric properties) of the measures developed and employed for the same have not been conclusively established (Shevlin et. al., 2000). One of the issues requiring resolution is whether the various dimensions of TE are discrete or whether they are reflective of a single higher-order dimension of TE (Abrami *et al.*, 1997; Marsh & Roche, 1997). Some researchers argue that students overall perception of the teacher may lead to more positive ratings irrespective of the actual level of teaching effectiveness. The same is supported by implicit personality theories (Asch, 1946; Bruner & Tagiuri, 1954). Some studies show that manipulation of bipolar attributes such as warm-cold (e.g. Kelly, 1950) produce a large effect in student judgment of their teachers. Other factors which have been found to influence student judgements are "Halo and horns effects" (Vernon, 1964) wherein student perceptions of single attributes may be generalized to other judgments of the individual. Another significant issue requiring resolution is whether the dimensions of TE are formative or reflective of a single higher-order teaching effectiveness construct (Abrami *et al.*, 1997; Marsh & Roche, 1997). It is also not clear whether the determinant variables are being measured or some variables being measured are becoming more important because they are measurable. There are thus significant issues related to the validity of measures of teaching effectiveness which are yet unresolved (Shevlin et al., 2000). This study aims to contribute to the existing literature of teaching effectiveness by validating a measure of student evaluation of teaching effectiveness (SET), evaluating the relationship of the dimensions with the overall measure of the trait of 'charisma' by extending the empirical study undertaken by Shevlin et al., (2000) in UK with students pursuing MBA program of a University of higher education in India.

Indian Higher education

Higher education in India has shown grown significant growth in recent years in terms of the number of students enrolled for higher education, the number of Institutions, number and type of courses being offered and the funds being invested (number of universities in India has increased from 20 in 1947 to 504 in 2010, a 25 times increase) (Gupta and Gupta, 2012).

According to MHRD Annual report 2009-2010, as of March 2009, the country had 26455 institutes of higher education; 504 universities and university level institutions and 25,951 colleges. At the commencement of the academic year 2009-2010 the overall formal system enrollment in the various universities and colleges was reported at 13.6 million, while the total number of faculty members was reported at 0.59 million (Gupta and Gupta, 2012).

However, educational quality is still lacking due to several problems like funds crunch, equity, reorientation of programs, ethics, value associated with delivery of education, teaching learning process, assessment and accreditation of institutions, academic standards of the students, quality of research, innovativeness and creativity. Even with the establishment of accreditation committees like NAC and AICTE, recent reports suggest that Indian Institutions are far behind in delivering quality of education. Only one IIT (place not mentioned) has been listed as 41st ranked amongst the top 100 educational institutions of the world (Krishnan, 2011).

Indian Educational Sector

The Institutional framework of Higher education sector in India comprises of Universities established by an Act of Parliament (Central Universities) or of a State Legislature (State Universities); Deemed Universities (institutions which have been accorded the status of a university with authority to award their own degrees through central government notification), Institutes of National Importance (prestigious institutions awarded the said status by Parliament), and Institutions established by State Legislative Act and colleges affiliated with the University (both government-aided and unaided) (Gupta and Gupta, 2012).

Technical education in India comprises of 65 centrally funded institutions like IITs, IIMs, NITs, IISc, etc. and technical institutions set up by state governments. The technical education is regulated by All India Council of technical education (AICTE) and equivalent sectoral regulators (like the Medical Council of India) which approve and regulate technical institutions in engineering/technology, pharmacy, architecture, hotel management & catering technology, management studies, computer applications and applied arts & crafts (Gupta and Gupta, 2012). Vocational Education in India consists of a network of public and private polytechnics and vocational institutions, controlled and supervised by the Councils specializing in each discipline. There are 14 Open Universities of distance learning of which Indira Gandhi National Open University (IGNOU) was the pioneer. They are regulated by the Distance Education Council of India (DEC), New Delhi. The quality of education is monitored and certified by the National Assessment and Accreditation Council (NAAC) established by the UGC in 1994, the National Board of Accreditation (NBA) set up by AICTE in 1994, and for the Accreditation Board (AB) set up by ICAR in 1996 (Gupta and Gupta, 2012).

Review of Literature

Teaching Effectiveness-definition and measurement

There exists a debate in literature regarding the definition of effective teaching and the measures that can capture it. Some of the definitions of effective teaching in literature are as follows: “all the instructor behaviors that help students learn” (Cashin, 1989,); “Providing maximum opportunities for all students to learn (Westwood, 1998); “teaching that fosters student learning” (Wankat, 2002). Further, numerous assessment procedures have been introduced by researchers to measure the quality of teaching in educational settings which include classroom observation, student learning and achievement, peer evaluation, and student rating.” Teaching effectiveness has mostly been measured through a student questionnaire specifically designed to measure observed teaching styles or behaviors (Wright & O’Neil, 1992). In many universities, student ratings are used as one (sometimes the only and often the most influential) measure of teaching effectiveness (Kwan, 1999). However researchers have debated the validity and reliability of these ratings and attempted to provide evidence for either case. According to some researchers and academicians, student ratings are nothing more than a matter of whether the professor gives good grades or not, or whether the professor is easy or popular, creating a potential threat for validity. Because of this controversy, there are several myths about student ratings regarding whether they have influence on how the professors are evaluated above and beyond their teaching (see Basow & Silberg, 1987; Basow, 1995; Adamson, O’kane, & Shevlin, 2005; and Safer, Farmer, Segalla, & Elhoubi, 2005).

Student Evaluation of Teaching Effectiveness (SET)

SET is routinely used in most colleges and universities across the world as part of evaluation of teaching effectiveness (Seldin, 1985; Abrami, 1989; Wagenaar, 1995; Abrami *et al.*, 2001; Hobson & Talbot, 2001). Student evaluation of teaching (SET) is widely used in universities in UK and USA wherein it's also used to effect potential changes in course material and method of delivery.

The Quality Assurance Agency for Higher Education (QAA) have included it in their documentation regarding subject review practices, (QAA, 1997). In the USA, SET influences faculty decisions about conditions of employment, salary and promotion. Therefore, research on student evaluations of teaching effectiveness (SET) has been focused on issues of development and validity of an evaluation instrument (Marsh, 1987), the validity (Cohen, 1981) and reliability (Feldman, 1977) of student ratings in measuring teaching effectiveness and the potential bias of student ratings (Hofman & Kremer, 1980; Abrami & Mizener, 1983; Tollefson *et al.*, 1989). There is however divergence in literature on the nature and the number of dimensions of the construct of teaching effectiveness (Patrick & Smart, 1998). A review of previous studies shows that the number of factors of teaching effectiveness in literature (Table 1.0) varies from two to eleven.

Table 1.0: Review of number of dimensions of Teaching Effectiveness

Authors	Number of dimensions/Factors of Teaching Effectiveness
Shevlin et al, (2000)	Two factors ie Lecturer ability and Module Attributes
Patrick and Smart (1998)	Three factors ie (1) respect for students, (2) organization and presentation skills, and (3) ability to challenge students
Lowman and Mathie (1993)	Two factors ie 1) intellectual excitement, and (2) interpersonal rapport
Atkins (1993)	three factors ie (1) caring, (2) systematic, and (3) stimulating
(Marsh & Dunkin, 1992).	Nine factors
Ramsden, 1991)	Seven factors

Adapted from The Validity of Student Evaluation of Teaching in Higher Education: Love me, love my lectures?, Assessment & Evaluation in Higher Education, by Shevlin et al., (2000).

Research shows that various external factors also influence student ratings of teaching effectiveness (Table 2.0) and hence the validity of the instrument in specific contexts assumes importance so that appropriate instruments can be deployed for assessment of TE.

Table 2.0: Review of relationship between external factors and Student ratings of Teaching Effectiveness

Authors	Findings
Fernandez <i>et al.</i> , 1998	Weak relationship between class size and student ratings with the largest and the smallest classes giving the most positive ratings
d'Apollonia & Abrami, (1997)	Strong relationships between ratings of teaching effectiveness and variables related to student characteristics, lecturer behavior, and the course administration
Marsh & Roche (1997)	Positive relations between ratings and the prior subject interest of the student and the reason for taking the course
Greenwald and Gillmore (1997)	demonstrated that grading leniency had a strong positive relationship with ratings of teaching effectiveness
Marsh (1987) and Feldman (1976)	positive association between expected grades and ratings of teaching effectiveness.

Adapted from The Validity of Student Evaluation of Teaching in Higher Education: Love me, love my lectures?, Assessment & Evaluation in Higher Education, by Shevlin et al., (2000).

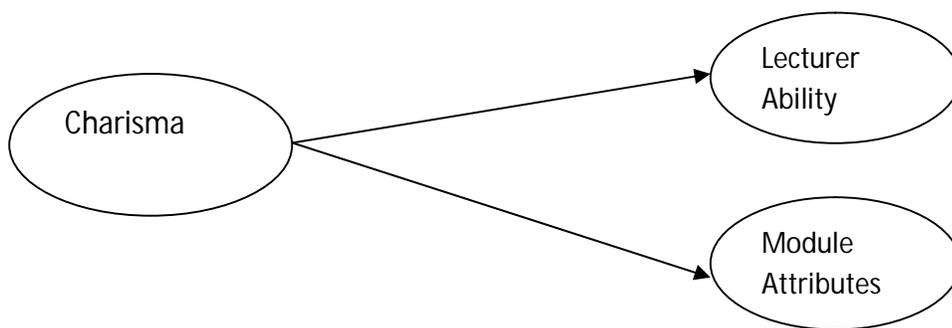
Conceptual model

There is thus wide variation in literature with regard to the number of factors of Teaching Effectiveness (Brown & Atkins, 1993; Marsh & Roche, 1997; Patrick & Smart, 1998; Ramsden, 1991). This is partly attributed to the existence of an underlying variable i.e., the personal quality of leadership also described as charisma.

The explanation for the wide variation in factors constituting TE is that the effectiveness of a teacher affects their ratings of charisma. Teaching is construed as a multi-dimensional construct wherein students approach the evaluation of teaching by rating specific features of teaching on the basis of a global evaluation (d'Apollonia & Abrami, 1997), known as charisma which implies that there is a single underlying trait that accounts for SET scores (Shevlin et al, 2000). It is thus argued here that the quality of charisma affects students' judgments including that of teaching effectiveness. Charisma has been shown to affect voter judgments of politicians (Pillai et al., 1997), as well as leadership at work (Fuller et al., 1996).

Thus it is suggested that charisma affects students' perceptions of teachers and their assessment of TE (Shevlin et al., 2010). The measure of student effectiveness of teaching effectiveness shows that student's perception of the teacher would significantly predict teaching effectiveness ratings. Hence, it's hypothesized that teaching effectiveness is a multi-dimensional construct consisting of the two dimensions of 'lecturer ability' and 'module attributes' and that charisma is the global evaluation of the teacher which is reflected by the two dimensions of teaching effectiveness.

Figure 1.0 Hypothesized model of Student Evaluation of teaching effectiveness



Adapted from The Validity of Student Evaluation of Teaching in Higher Education: Love me, love my lectures?, Assessment & Evaluation in Higher Education, by Shevlin et al., (2000).

Methodology

The study was conducted with 209 graduate students in January-March 2013 pursuing MBA program at a reputed University of Delhi state government in New Delhi, India. The demographic details of the participants were not collected for reasons of anonymity although there is no apparent reason why the profile of the students at the university would significantly differ from other institutions offering the MBA program or its equivalent. The sample size used for data analysis after deletion due to missing data, erroneous entries et al was 201. The participants were required to rate their teachers in the marketing courses of first year in total twenty sessions in each course. The students rated two male and two female teachers during the study.

Measurement Scale

The initial 11 items scale of teaching effectiveness used by Shevlin et al. (2000) was used in the study after modification by addition of two items based on expert reviews with academicians and researchers. The 13-item teaching effectiveness self-reported scale (Appendix 1) was administered to students by a member of the administrative staff. The hypothesized scale was designed to measure students perceptions on the two dimensions of teaching effectiveness and consisted of seven items (items 1, 2, 3, 4, 5,6,11) as measures of 'lecturer ability', and four items (items 7, 8, 9, 10) as measures of 'module attributes'. Students were expected to rate their teachers on a 5-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (5). Item nos' 12 and 13 'The lecturer has charisma', and 'The lecturer helped in transforming me to take interest in studies' were employed as measures of the charisma of the lecturer/teacher.

Exploratory factor analysis: The data was initially analyzed through factor analysis to establish the unidimensionality of the measure. The data was found appropriate for factor analysis based on KMO measure of sampling adequacy = 0.823 and Bartlett's test of sphericity having chi square value of 685.511 ($p = 0.000$), (Hair et al., 2006).

The exploratory factor analysis conducted on the 11-item (Table 3.0) scale of teaching effectiveness resulted in a two-factor solution using principal component method of factor extraction and varimax method of rotation. The two components/factors were extracted for further analysis based on their eigenvalues which were greater than 1.0 with cumulative variance explained equal to 60%. The factor loadings are shown in Table 3.0. Two items (Item No.s 1 and 2) did not load on any component (factor loading less than 0.5) and were therefore not selected for further analysis.

Table 3.0 Exploratory factor analysis (EFA) with varimax rotation of data collected on 11 items of teaching effectiveness

Scale Items	Factors extracted through EFA (Varimax rotation)		
	1	2	3
lect1	.564	.420	.014
lect2	.534	.400	.111
lect3	.132	.750	.142
lect4	.289	.641	-.113
lect5	.146	.744	.317
lect6	.143	.587	.340
mod1	.696	.231	.107
mod2	.799	.070	.119
mod3	.665	.065	.477
mod4	.268	.226	.786
lect7	.054	.118	.861

Generated from the study

Findings

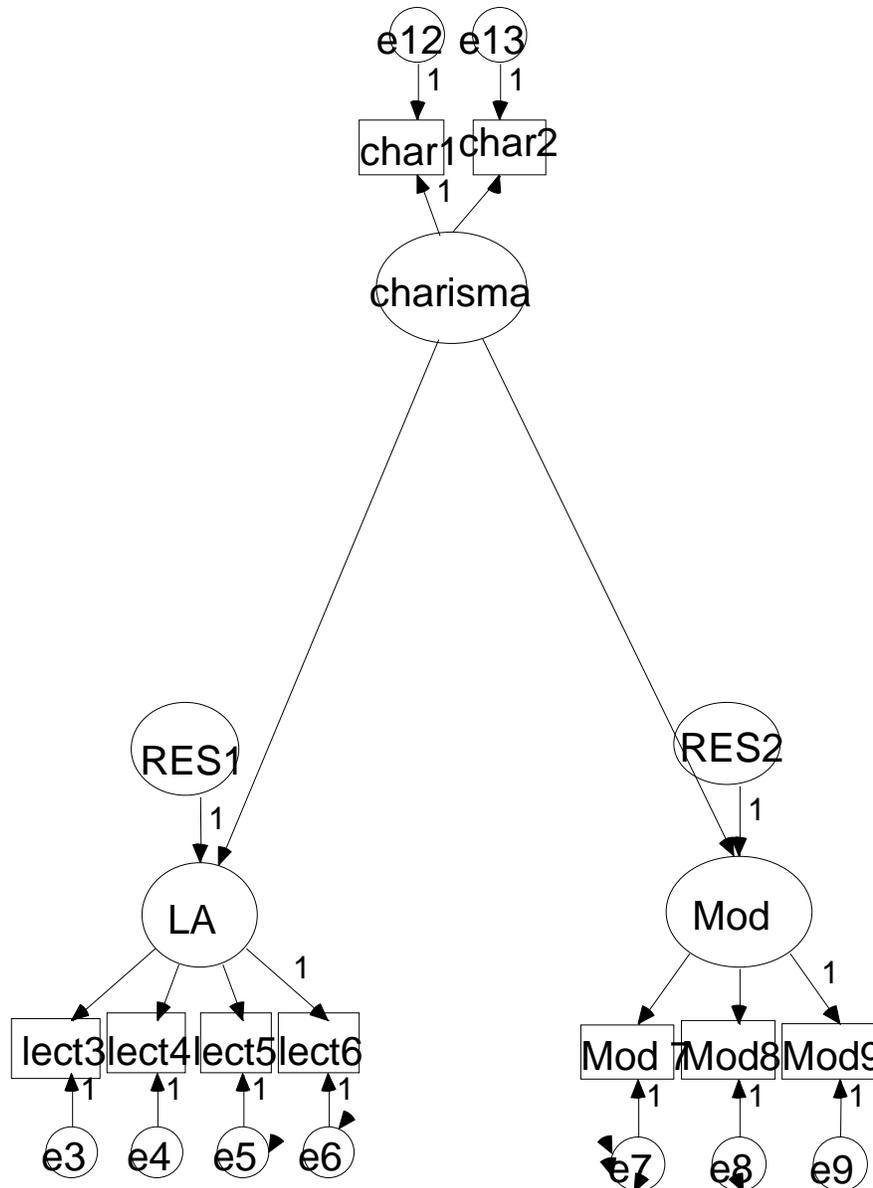
Confirmatory factor Analysis: The structure pattern of the two dimensional initially extracted model (Table 3.0) was further evaluated for construct validity by undertaking confirmatory factor analysis using AMOS ver 4.0. The two-factor measurement model (Figure 1.0) as initially hypothesized was specified and the model parameters were estimated using AMOS ver 4.0. The items were restricted to loading on their respective factors. However, the model was not found acceptable based on indices of fit and hence the model was modified by deleting the items with cross loading and factors which were affecting model fit based on modification indices (Byrne, 2001). The model eventually resulted in acceptable fit as shown in Figure 2.0 based on fit indices. The final model with acceptable fit was a two dimensional model as initially hypothesized with seven attributes having significant loading on their respective factor (Figure 2.0). The dimensions of teaching effectiveness and their respective measurement attributes (with their standardized regression co-efficient values) are shown in Table 4.0. The model's overall goodness-of-fit indicators are GFI = 0.972; CFI = 0.991; NFI = 0.932; RMR = 0.038; RMSEA = 0.032, as given in Table 4.0.

The Chi Square statistic of 26.583 with 22 degrees of freedom was significant as it is up to 2 times the number of degrees of freedom (Bollen, 1989). The t statistics were significant for each path with critical ratios more than twice the standard errors (Joreskog and Sorbom, 1989). The model was of suitable fit and its parsimony was supported. All the t-values of the estimated parameters were significant ($p < 0.001$). The two dimensional structure was conceptually consistent with the model of teaching effectiveness suggested by Shevlin et al, (2010) in their study with students of UK as shown in Table 4.0.

The scale was of acceptable reliability as measured by Cronbach alpha scores for the two dimensions of teaching effectiveness which were ‘Lecturer Ability’ = 0.725 and ‘Module Attributes’ = 0.720. Convergent validity was evaluated according to criteria identified by Fornell and Larcker (1981) and established as shown in Table 5.0, wherein the results of the CFA revealed good to strong standardized regression co-efficient loadings of teaching effectiveness items/attributes on their respective dimensions (ranging from 0.493 to 0.768). All loadings were statistically significant at the 0.05 level ($t > 1.96$).

The results thus show that charisma is reflected by the teaching effectiveness dimensions of ‘lecturer ability’ and ‘module attributes’ as shown in Table 6.0.

Figure 2: The model of SET with acceptable fit



Legend: Char 12,13: items nos 12 and 13 for charisma;lect3,4,5,6,: Items no 3,4,5,6 for lecturer ability; mod 7,8,9: Item nos 7,8 and 9 for module attributes ; LA-Lecturer Ability;Mod-Module Attributes

Table 4.0 : Two dimensional model of teaching effectiveness-CFA results

Fit Indices	Results
Chi Square(degrees of freedom=22)	26.583
Goodness of fit index	0.972
Normed Fit Index	0.953
Comparative Fit Index	0.991
RMR	0.038
RMSEA(p Close=0.739)	0.032

Table 5.0 Dimensions of teaching effectiveness and their attributes with factor loadings

Dimension	Attributes /Items	Standardized Factor Loading values
Lecturer ability	The lecturer is able to explain difficult concepts in a clear and straight forward way.	0.630
	The lecturer makes use of examples and illustrations in his or her explanations of concepts	0.493
	The lecturer is successful in presenting the subject matter in an interesting way	0.768
	The lecturer is successful in encouraging students to think independently and do supplementary reading on the subject matter of the module.	0.628
Module Attributes	The module is what I expected	0.550
	The references given were very useful	0.632
	In this module I learnt a lot	0.740

Table 6.0

First order paths	Results
Charisma → Mod	0.882
Charisma → LA	0.665

Discussion

The purpose of the study was to empirically validate a model of teaching effectiveness (Figure 1.0) with students of pursuing MBA program of higher education in India and to test the hypothesis that the teachers trait of ‘charisma’ would be reflected by the students perceptions of ‘lecturer ability’ and ‘module attributes’ as shown by Shevlin et al., (2010) with students of higher education in UK. The results of the study show that the hypothesized model is applicable in Indian higher education context with slight modification. Teaching effectiveness is a two dimensional construct consisting of the dimensions of ‘lecturer ability’ and ‘module attributes’ as shown in Table 5.0 and charisma is the underlying trait of the teacher which influences student evaluations of the two dimensions of teaching effectiveness. The study also shows that the dimensions are reflective of a single higher-order construct as shown in the hypothesized model (Figure 1.0).

The results thus empirically establish that student’s perceptions of charisma of the teacher explains’ a significant percent of the variation of SET rather than the individual ratings of dimensions of “lecturer ability” and “module attributes”. The results provide empirical support for the classic work of Asch on implicit personality theories (Asch, 1946; Bruner & Tagiuri, 1954) and House’s (1977) theory of charismatic leadership which emphasize that the relationship between the leader and the follower are influenced by the behavioral features of a charismatic leader.

Implications for academicians of higher education are that teachers are attributed a level of charisma by students based on their level of 'lecturer ability' and 'model attributes', which influences student ratings of teaching effectiveness. Thus, SET ratings should not be interpreted alone but utilized along with other measures as they are effected by 'charisma' which is unrelated to teaching ability. The validity of the scale of teaching effectiveness is questionable for teacher's performance assessment due to the prevalence of halo effect. The two factors of 'lecturer ability' and 'module attributes' are reflective of a halo effect which also partially explains the wide discrepancy in factors of teaching effectiveness identified in literature (Brown & Atkins, 1993; Marsh & Roche, 1997; Patrick & Smart, 1998; Ramsden, 1991). Thus, future research can focus on how to reduce the halo effect of charisma which reflects the teachers leadership abilities rather than teaching ability. Further refinement of the hypothesized and tested model is suggested by including other variables or/and testing other model specifications (for exp. a formative vs a reflective model)

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Appendix 1. Student evaluation questionnaire

Serial No.	Statements	SD	D	N	A	SA
1	The lecturer speaks clearly					
2	The lecturer presents material in an organized and coherent way					
3	The lecturer is able to explain difficult concepts in a clear and straight forward way.					
4	The lecturer makes use of examples and illustrations in his or her explanations of concepts					
5	The lecturer is successful in presenting the subject matter in an interesting way					
6	The lecturer is successful in encouraging students to think independently and do supplementary reading on the subject matter of the module.					
7	The module is what I expected					
8	The references given were very useful					
9	In this module I learnt a lot					
10	In my opinion this module was enjoyable and worthwhile					
11	The lecturer was very approachable for the difficulties in the module.					
12	The lecturer has charisma					
13	The lecturer helped in transforming me to take interest in studies.					

(Abbreviations: SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree)

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