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Mediating role of students' engagement to their classes

An experience from higher education in Pakistan

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Abstract

Purpose – The purpose of this paper is to establish the mediating role of students' engagement to their classes, for the conventional relationship between teachers' efforts and students' development, for a better understanding of the instruction-based classroom learning.

Design/methodology/approach – The investigation is made using a mult-istage-stratified-systematic sample of 500 students from business and engineering schools with an almost equal representation of both the genders and the type of schools' ownership. A structural equation modeling is used for this mediation analysis.

Findings – The mediating role of students' engagement is identically established both for business and engineering schools and for both genders. However, in public sector universities, this mediation is insignificant.

Research limitations/implications – The investigation is limited only to business and engineering schools, and this limitation may conceal some factor(s) more important for other schools. Further, the investigation is reading data from Lahore, a metropolitan, which may hide some factor(s) some appropriate for smaller cities.

Originality/value – The data are gathered, analyzed and discussed through the lens of the socio-cultural theory, allowing for a comprehensive understanding to emerge for students' engagement to their classes.

Keywords Quality of higher education, Social learning theory, Students' engagement

Paper type Technical paper

Introduction

In instruction-based education, the role of teacher is critically exclusive. May it be the vernacular folk literature or the conventional academic discourses, the role of the teacher is always given the highest echelon for the student's learning and development. The whole education system seems to be revolving around the teachers' efforts and performance. However, there exist deviations and exceptions, both at observatory and analytical levels for this direct relationship. A teacher performing exceptionally well in one set of circumstances may not be able to reproduce its effectiveness in the other set of circumstances. So much so, a teacher performing well in one section of a class may not be able to perform equally in the other section of the same class while teaching in the same academic year. Without ignoring the students' ability differentials, these observations indicate some extraneous variable(s) which mediate this conventional relationship between a teacher's efforts and the student's learning and development. Let us call this mediating variable as the student's engagement to their classes which converts the teachers' efforts into students' development. The current paper is written for a sole objective that students' engagement to their classes mediates the relationship between the teachers' efforts and the students' performance in the classes.

The concept of students' engagement to their classes is a newly developed concept (Allen *et al.*, 2018; Barkley, 2018; Kahu and Nelson, 2018) and has been defined in different

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ways by different researchers. However, it may either be theorized as a sense of social relatedness or belongingness (Bear *et al.*, 2018; Hughes and Kwok, 2007), or an experience (Ellis *et al.*, 2018; Siddiqi, 2018), which is based upon a number of in- and out-class factors. It is believed, and empirically proved in many different scenarios and socio-economic settings, that it is the sense of engagement that motivate students to participate actively and appropriately in their classrooms (Anderman and Anderman, 1999; Birch and Ladd, 1997; Skinner and Belmont, 1993). Such a motivated participation and appropriateness leads directly to successful academic and socially better outcomes. This makes one thinks that the teacher's efforts are translated into the feelings of engagement among its student, and it is the level of engagement that is directly related to the level of success of the students.

Theoretical background

Education in its traditional sense is a form of learning in which knowledge, skills and behaviors of a group of people are transferred from yester generation to the next through teaching, training, and research. Such a teaching is a twin faced process, as Dewey (1897) puts it; psychological in basis as it starts with a child's own instincts and abilities, and social in its explicit manifestation as it involves, both direct and indirect, explicit and implicit, interaction between stakeholders. Both of these faces are not supplementary to each other but complement the success of whole process. Teacher lies at the center of all discussions (Griffin and Brownell, 2018; Levin, 2018); its personality, its motivation, its drive, its behavior, everything is heavily researched and has significant impact on its performance which ultimately reflects in the students' outcome. The psychological construct of its performance discusses internal drive, motivation and sense of achievement (Alessandri *et al.*, 2018; Carmona-Halty *et al.*, 2018). While, the social construct is based upon expectation (Kim *et al.*, 2018; Perera *et al.*, 2018; Rubenstein *et al.*, 2018). Without belittling the prominence of psychological basis of the education process, this paper is focusing on the social side.

The paper is using three specific domains of theories to understand the education process, namely, social learning theories which explicates a teachers' efficacy in terms of its behavior, pedagogical theories which focus on the process and the substance the students should be dealt with and student involvement/engagement theories which focus on the experience generated through the combined action and interaction of both teacher and the process. The idea discussed here in this paper has its roots in all of these three. However, it needs to be tested empirically for its establishment.

The social learning theories presents a traditional view of the social aspect of the process. It is quite straightforward and based upon the interactions and behaviors. Believing the teacher being the first pillar of the process, it is thought that the teacher's behavior is cultivated by his, or her, experiences and the stimuli generated through environment in contrast to mere drive as claimed by stimulus response theories (see e.g. Hull, 1930). Rotter (1966, 1970, 1982), in his social learning theory, asserts that the teachers' likelihood of engaging in a certain behavior is formed by the perception of the outcome of the behavior and the probability of that outcome. He calls this perception as reinforcement value of the behavior and the probability as its expectancy. More, specifically, a teachers' behavior (B) is given by a function of this reinforcement and its expectancy, as:

$$B = f(E, R)$$

where E is the expectancy, in terms of perceived probability that the desired results would produce, and R is the teachers' reinforcement value of the behavior. The theory is quite straightforward and attempt to functionalize a teachers' behavior, which may lead to some pre-conceived outcomes at students' side, in terms of its perceived success. More specifically, a teachers' efficacy is a behavior which is evolved by its perceived outcome in

the class; better the expectation, more is the efficacy. The theory is probably the first which translates the efficacy into the nature of social interactions. The RAND researchers applied this theory to conceive that the extent to which teachers believe that they control the reinforcement of their actions lay within themselves or in the environment (Tschannen-Moran *et al.*, 1998). Besides its simplicity and straight forwardness, the theory faces strong criticism. Expectancies are calculated from past experiences. The more often a behavior has led to reinforcement in the past, the stronger the person's expectancy that the behavior will achieve that outcome now. Reinforcement value refers to the desirability of these outcomes. As a matter of fact, things one wants to happen, that one is attracted to, have a high reinforcement value. And, things one does not want to happen, that one wishes to avoid, have a low reinforcement value.

Another theory which is used to explain the social side of the education process is enunciated by Bandura (1977, 1989, 2001). It is a logical continuation, and extension, of Rotter's (1966, 1970, 1982) deliberations. He emphasizes the role of self as a significant and powerful moderator in the translation of social interactions into efficacy. In other words, if the teacher is motivated enough for the outcome, higher would be the efficacy. More specifically, the functional relationship should have a form given by:

$$B = f(E, R, S),$$

where S is the factor represents' self in terms of cognition, belief and personality. Bandura (1977) believes that humans are active information processors and think and then control about the relationship between their behavior and its consequences. Observational learning could not occur unless cognitive processes were at work.

Both of these theories are very relevant for explaining the relationship between a teacher's efforts and performance and the student's learning and development. These theories explains the role of behavior in the carving and developing a teachers' efforts, while the reinforcement to this behavior is developed either due to their personal expectations and/or their self. The functional form, both in Rotter (1966) and Bandura (1977), is not linear or simplistic and depends upon many endogenous and exogenous factors (Goddard *et al.*, 2000). It may be the subject matter, its nature, quantity and quality, classroom ecologies, agronomy which effect the shape of this function.

These factors lead to the second domains of theories that have been considered here. Let us call them pedagogical theories as these related to the pedagogical process of transferring knowledge and skills. These theories consider the education process as a manufacturing process with the learning and development of the students as the tangible, and thus measurable, product and based upon the principle, popular in industrial settings, that better the process better, is the product. These include first, the theories related to the subject matter and the contents that should be adopted in different classes. The concept is simple; right the material, right the output. It requires fixed curriculum, roadmaps and policies every student has to take. Most of the engineering schools, especially in Pakistan, are working on this fixation. Albertyn *et al.* (2008), Gibbs and Simpson (2005), Keith and Cool (1992), Marsh and Yeung (1997), Pike (1991), Simonite (2003) are few names who work for the advocacy of this theory. Second are the theories related to the campus environment and facilities available to students. The main concept here is: better the environment and facilities available to students, better are the students in their achievements and development. Allen (1992), Ancis *et al.* (2000), Belch *et al.* (2001), Bradshaw *et al.* (2018), Davis (1994), Hurtado (1992), Kahu and Nelson (2018), Kuh (2009), Thomas and Galambos (2004), Zhou (2017) are a few names who believe that campus resources and the environment is an important determinant in the success of the education process. Most of the accreditation bodies, like Higher Education Commission, Pakistan Engineering Council in Pakistan, European Quality Standards, etc., believe in this

resource theory, Third are the theories related to the individuality of a student. The concept is: need of every student is unique and has to be dealt specific to these needs. It goes beyond the curriculum and resource related boundaries and address directly the student with respect to its individual specialized needs.

As a matter of fact, both of these types of theories are one in nature as both are stimuli attempts to transform the students. The third theory which plays significant part is the theory of engagement. The theory of engagement is concerned with inter-relations of time, teachers' enforcement, ecologies and other relevant resources invested by students, teachers and the universities intended to maximize the students' experience (Siddiqi, 2018). The literature is replete with numerous works establishing its importance in different dimensions. It is an experience which has its roots in the classrooms and is based however on many other, both endogenous and exogenous, dimensions. The literature on the topic seems to be split between schools of thought which are either based upon the constructivist theory (Ginsburg and Opper, 1988; Wadsworth, 1996) and involve factors endogenous to the classroom itself, or the socio-cultural theory (Hickey and Granade, 2004; Lantolf, 2000; Vygotskiĭ, 2012) which involves factors mostly exogenous in nature. The assessment of the experience is typically at the classroom level and involves global assessments across all activities. Many definitions and measures focus on the teacher, and the factors endogenous to the classroom for developing this engagement. Like Blatchford *et al.* (2011) explore the role of class size, Diemer *et al.* (2013) explore the role of technology (iPods); Jensen (2013) investigates the role of poverty; Vitiello *et al.* (2012) investigate the effect of class time and timing; Shernoff *et al.* (2017) investigate the role of seating position (Castro *et al.*, 2017); Valiente *et al.* (2012) explain the impact of students' psychology; Oga-Baldwin and Nakata (2017) explore the role of motivation, on the part of teacher; Buhs *et al.* (2010) explore the connection between in-class peer-to-peer victimization and social, or physical, exclusion; Bingham and Okagaki (2012) study the impact of ethnicity, etc., just to name a few variables researchers have investigated and explored their roles for developing classroom engagements.

These three domains of theories develop an interesting troika to understand the education process where the social learning theories emphasize the role of teacher (in terms of his/her behavior) for the development of students; the pedagogical theories emphasize the role of the process of imparting education for this development in students while the engagement theory accentuates the experience at the class, and/or in the campus, which actually transforms the students.

Hypothesis to be tested

Believing the dynamics of school and university education are different, the scope of the current paper is limited to university education only. Further, it is limited to the students of business and engineering schools primarily to cater the students of privately owned universities which impart education to these two types of students. The hypothesis to be tested in the paper is given by:

H1. Students' engagement to their classes is a mediator for the relationship between teachers' efforts and students' development.

Methodology

With presumably teachers' efforts and pedagogical process at one end, students' development and learning at the other, while the students' engagement is meddling in between, acting as a mediator for the traditional relationship between the formal two. This presumption seems quite logical; however, it needs formal testing for its assertion. The paper is an attempt toward the same direction.

The questionnaire

The study is based upon three different, however, duly tested questionnaires to cater its different needs:

(1) The questions measuring the students' engagement to their classes is based upon a study conducted to explore students' engagement for a measuring construct for the same by Siddiqi (2018). The data are taken from different students of business and engineering students. The result is six factors' construct for students' engagement to the classes, with items seeking information on university atmosphere, different facilities available in university, rigor of the course work, social diversity of the class, teachers' professional competence, and class conduction rules and policies, being the important factors in descending order of importance. Cronbach's (1951) α value is reported to be 0.817. These factors are estimated by 59 different variables focusing on different socio-psycho-eco-educational characteristics of the classes and the schools.

(2) Ramsden (2003) enlists 13 characteristics of good teaching, namely, a desire to share your love of the subject with students, T1; an ability to make the material being taught stimulating and interesting, T2; a facility for engaging with students at their level of understanding, T3; a capacity to explain the material plainly, T4; a commitment to making it absolutely clear what has to be understood at what level and why, T5; showing concern and respect for students, T6; a commitment to encouraging independence, T7; an ability to improvise and adapt to new demands, T8; using teaching methods and academic tasks that require students to learn actively, responsibly and co-operatively, T9; using valid assessment methods, T10; a focus on key concepts, and students misunderstandings of them, rather than covering the ground, T11; giving the highest quality feedback on student work, T12; ans a desire to learn from students and other sources about the effects of teaching and how it can be improved, T13. These characteristics have been taken as items for seeking information on teaching quality. The construct is been widely used to assess the teaching quality and its Cronbach (1951) value is reported to be more than 0.70 (Byrne and Flood, 2003; Chan, 2003; Duff, 2003; Prokop *et al.*, 2007; Richardson *et al.*, 2012; Stes *et al.*, 2008).

(3) Students' output is measured in terms of their academic and social attainments (Allen, 1992; Jacobsen and Forste, 2011; Richardson *et al.*, 2012). The social attainments are measured through questions taken from the well-reputed and well-published Emotionality–Activity–Sociability–Impulsivity scale (Rowe and Plomin, 1977).

A pilot survey was being conducted to establish the reliability of the questionnaire. The overall reliability, as calculated by using Cronbach's (1951) α, is 0.775 which is sufficient enough to call the instrument reliable for the current investigation.

The participants

The sample size estimation is based upon Guadagnoli and Velicer (1988) and Hair *et al.* (2007), where the data are gathered from 500 (52 percent male, 48 percent female) university-level students attending business and engineering schools (50 percent business and 50 percent engineering students) of universities working each in public and private sectors (54 percent private and 46 percent public sector's students) with a mean age of 23 (SD = 3.2) years. The only reason for selecting the students from these two schools is to consider both science and social-science students.

The research design

The data are collected using multi-stage stratified systematic sampling. The sector of operation, being public or private, and the type of school, being business or engineering, are the respective stratifications at the two stages of the sampling. Probability proportional allocation scheme is used to extract participants from the universities in Lahore, Pakistan, which offer both business and engineering programs (6 out of 13 in public, 15 out of 24 in private sector); 40 students (21 males, 19 females) are selected from each selected public sector university, while 18 students (10 males, 8 females) are selected from each private sector university. Students are contacted, for questionnaire filling, just after their classes to confirm their identity as being business or engineering students. A deliberate attempt is made to adjust equality between males and females while asking students to fill in. All questionnaires are filled around noon as these are the hours when maximum number of students are present in the universities. The whole data are collected in the month of November.

Results and discussions

The model is quite a complex model, attempting to combine three different constructs as explained in the questionnaire. The flow diagram of the analysis is given in Figure 1.

The analysis is conducted by *R* (using library *lavaan* (Rosseel, 2012) for the analysis and *semplot* (Epskamp and Stuber, 2017) for the path diagram). Figure 1 is actually a re-drawing of the plot produced by *R* showing the flow and the make-up of the analysis (the real plot is too messy and cluttered to show this flow and make-up).

The structural equation model is developed by using generalized least squares (GLS) estimation (the conventional maximum likelihood estimation is not possible due to non-normality issue (Siddiqi, 2014)) with asymptotic distribution free function, as proposed

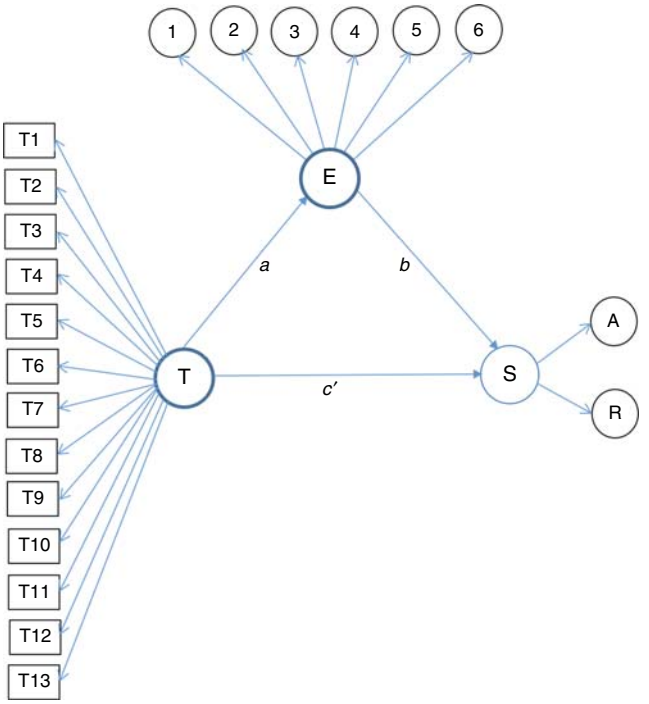

Figure 1.
Teachers' efforts translate into students' development through their engagements to classes

by Browne (1984), and given by:

$$F_{GLS} = \left(\frac{1}{2}\right) tr\left(\left\{S - \sum(\theta) W^{-1}\right\}^2\right),$$

with S being an estimator of $\sum(\theta)$ and W is a weight variable, usually taken as the inverse of the covariance matrix (Olsson *et al.*, 2000). The GLS, is obtained by minimizing the difference between S and $\sum$ after weighting it by W. The standard errors are estimated using bootstrap, primarily to tackle the issue of non-normality (Siddiqi, 2014). Typically, in the bootstrap technique, a large number of samples, usually 500 or 1,000 (Nevitt and Hancock, 2001; 2004), are drawn with replacement which create a mini sampling distribution (Bollen and Stine, 1993; Yung and Bentler, 1996), and based on the central limit theorem, it should have desirable distributional characteristics. These bootstrap samples are used to compute standard errors which are used in subsequent statistical tests of significances.

The structural model, as given in Figure 1, is estimated, using the F_{GLS} function given above. This model has to be corrected for different model-fit indices for an overall model acceptability using modification indices available in *lavaan* library. Like CMIN = 316.938, RMSEA = 0.047 (with 90% CI: LO = 0.038, HI = 0.055), PCLOSE = 0.730, GFI = 0.913, AGFI = 0.893, PGFI = 0.739, CFI = 0.902, NFI = 0.793, RFI = 0.767, IFI = 0.903, TLI = 0.889, PRATIO = 0.890, PNFI = 0.706, PCFI = 0.803, ECVI = 1.265 (with 90% CI: LO = 1.124, HI = 1.432), MECVI = 1.286, AIC = 234.511 (saturated model: 272.000, independent model: 1728.728), BCC = 239.742 (saturated model: 290.721, independent model: 1,730.931), BIC = 475.900 (saturated model: 1,135.915,independent model: 1,830.365), CAIC = 408.541 (saturated model: 894.843, independent model: 1,802.004). All these ratios and indices are well above the specific satisfactory thresholds for these ratios and indices. A detailed description of these model-fit indices is available in any standard text in structural equation modeling like Bowen and Guo (2011).

The mediated regression involves a direct relationship between Students' performance (the dependent variable, DV) as depends upon teachers' efforts (the independent variable, IV) as represented by the path *c*, and an indirect relationship between DV as depends upon IV through students' engagement with their classes (the mediator, *M*) as represented by the path *c'*. As a matter of fact, the path *c'* is a combination of the relationship showing how *M* depends on IV as represented by the path *a*, and the relationship showing how DV depends on *M* as represented by the path *b*.

The statistical literature presents mainly three distinct methods for conducting a mediated regression: first is Baron and Kenny's (1986) approach which furnishes the presence of mediation without formally testing its statistical significance. It requires the statistical significance of the paths *c*, *a* and *b* and then a smaller *c'* as compared to *c*. Second, Sobel's (1982) test furnishes the statistical significance of the mediation. It requires that the product *ab* as statistically significant which is calculated through its ratio with its standard error, σ_{ab}. By definition, such a ratio is distributed as student *t* distribution (Li, 1957). There exists, however, three different versions to estimate this σ_{ab}, respectively, be Aroian (1947), Goodman (1960),and by Sobel (1982) himself vary in the formulas to combine standard errors of *a* and *b*. Sobel (1982), being the latest, is usually considered to be a better combination. Sobel's (1982) test is superior to that of Baron and Kenny's (1986) approach but suits better to larger samples and marred with lesser statistical power (Preacher and Hayes, 2004; Preacher and Leonardelli, 2001). Third, Preacher and Hayes (2004) introduced the concept of bootstrapping to develop confidence intervals for the indirect effect, calculated by the product *ab*. This confidence interval is used to establish the statistical significance of the mediation; same sign of lower and upper boundary values of the confidence interval indicates statistical significance.

Table I shows the results of the mediated regression.

All *c*, *a* and *b* are statistically significant; at least at 5 percent, while *c'* is smaller than *c*. This furnishes, as per Baron and Kenny's (1986) approach, the mediation role of students' engagement with their classes for the relationship between students' performance and the teachers' efforts in the classes. The product *ab* is statistically significant, at 5 percent, which furnishes, as per Sobel's (1982) approach, the statistical significance of the mediation role of the students' engagement with their classes for the relationship between students' performance and the teachers' efforts in the classes. The bootstrap process, as enunciated by Preacher and Hayes (2004), yields a 95% confidence interval of {0.129, 0.371} for the product *ab*. This also renders the mediation role of students' engagement to their classes as statistically significant for their performance in the classes.

The deviation test, based upon the difference of the log likelihood values, as calculated by using the already defined, F_{GLS}, of the null and saturated model, which gives the fitness of the overall model, and yields a *p*-value of 0.078 and 0.073 (not shown in the table) for the relationships showed in paths *a* and *b*, respectively. Such large *p*-values cast doubts on the appropriate or singleness of the IVs in the models shown in *a* and *b* (Venables and Ripley, 1999). In non-statistical words, these *p*-values indicate the presence of some other variable, either as another IV, dummy, moderator or mediator, which is important enough to be included in the model. Without losing the specificity, the analysis may be split, here in this paper for dummy variables like gender of the students, being male and female; type of the students, being engineering and business students; and type of the ownership of the institute, being public and private sector. As a matter of fact, gender may not be a good dummy variable for the model under consideration as deliberate efforts are usually made in almost every institute of higher education to provide equal opportunities to both sexes. However, the other two variables may be the reasons of larger *p*-values.

A re-analysis of the data, for the split data, on the basis of the type of students, is done to develop separate structural models each for engineering and business students. The model needs to be refit for the two types of students. The structural model, as given in Figure 1, is estimated, using the F_{GLS} function given above. This model has some constrained estimation (due to smaller size of the split sample) and needs to be fixed either to zero or some other value. Further, it requires a few tweaking on the basis modification indices to correct the model for fitness ratios and indices. The results are shown in Table II.

Baron and Kenny's (1986) approach renders the mediation role of students' engagement as present for students from the business schools while for students from engineering schools this role could not be substantiated as the direct role (in path *c*) is not significant (which is one of the compulsion for this approach). However, Baron and Kenny's (1986) approach loses its credibility here as it is good only for large samples. As far as Sobel's (1982) test and Preacher and Hayes' (2004) approach are considered, this mediation role is statistically significant. This shows that the mediation role of students' engagement is statistically significant for both engineering and business students. The difference between the β values (path *c'*) of the two types of schools is statistically insignificant with student

		Direct model				Indirect model		
Independent variable		β	SE	*p*		β	SE	*p*
Teaching efforts	*c*	0.842	0.227	0.000	*a*	0.267	0.120	0.026
Students engagement		–	–	–	*b*	0.963	0.125	0.000
		–	–	–	*ab*	0.257	0.119	0.030
Total					*c'*	0.585	0.209	0.005

Note: Dependent variable: students' performance

Table I. Mediating regression analysis for all students

Independent variable		Direct model β	SE	p		Indirect model β	SE	p
Engineering students								
Teaching efforts	*c*	0.294	0.228	0.197	*a*	0.537	0.119	0.000
Students engagement		–	–	–	*b*	1.014	0.128	0.000
		–	–	–	*ab*	0.545	0.135	0.030
Total					*c'*	0.250	0.216	0.027
Business students								
Teaching efforts	*c*	1.235	0.230	0.000	*a*	0.364	0.124	0.003
Students engagement		–	–	–	*b*	0.924	0.123	0.000
		–	–	–	*ab*	0.336	0.121	0.005
Total					*c'*	0.898	0.215	0.000

Note: Dependent variable: students' performance

Table II.
Mediated regression analysis split for engineering and business students

t-value of 2.567 (*p*-value = 0.221). For business students, the engagement factor is more prominent (observe the difference between *c'* and *ab* in Table II) as compared to the engineering students.

The re-analysis of the data, when split is made with respect to the ownership of the university, being either public or private, reveals very interesting results as shown in Table III.

The mediation role of the students' engagement to their classes is not substantiated either using Baron and Kenny's (1986), Sobel's (1982) or Preacher and Hayes' (2004) approach in case of public sector universities in stark contrast to private sector universities. The difference between the β values (path *c'*) of the two types of schools is statistically insignificant with student *t*-value of 1.476** (*p*-value = 0.021). What is so special with universities of private sector or what is wrong with universities in public sector? The answer requires a separate study. However, observations are quite straightforward. For public sector universities, teachers are not able to develop engagement among the students to their classes; path *a* is not statistically significant. One needs to conduct a separate study to rummage this insignificance; however, a common observation may relate this to the superiority perception of the students at the public sector universities. As a matter of fact, the public sector universities attract comparatively more intelligent students for being less expensive as compare to private sector universities. This may results in the creation of superiority perception among these students which makes them oblivious to the classrooms. However, this is mere conjectural and requires scientific study to establish. And, since there

Independent variable		Direct model β	SE	p		Indirect model β	SE	p
Public sector								
Teaching efforts	*c*	0.185	1.028	0.571	*a*	0.134	0.419	0.625
Students engagement		–	–	–	*b*	0.084	0.723	0.546
		–	–	–	*ab*	0.011	0.535	0.508
Total					*c'*	0.215	0.816	0.604
Private sector								
Teaching efforts	*c*	0.938	0.130	0.000	*a*	0.466	0.123	0.000
Students engagement		–	–	–	*b*	1.034	0.126	0.000
		–	–	–	*ab*	0.482	0.137	0.000
Total					*c'*	0.471	0.218	0.031

Note: Dependent variable: students' performance

Table III.
Mediated regression analysis split for public and private sector universities

does not exist any engagement, teachers' efforts and the diligent performance could not be translated into the students' development.

An analysis is also conducted to appreciate the difference, if there exist any, between the two genders for the mediated role of their classroom engagements. However, the statistical analysis (not shown in the tables) could not differentiate between them.

Concluding remarks

The vernacular version of the education emphasizes the role of teacher for the progress and development of the students with more the efforts made by the teacher, better are the students, while the more recent version emphasizes the role of pedagogical process of the education, including the material, policies, etc., responsible for the development of the students. Both of these versions focus on a direct relationship between a teacher's efforts and the students' development. Here, in this paper, the directness of this relationship is challenged and have been hypothesized that the teachers' efforts develop engagement experience for the students for their class, and it is the engagement factor which is actually responsible for the development and progress of the students; better the engagement, better is their development. In other words, the students' engagement to their classes is a mediation factor for the relationship between teachers' efforts and the students' developments.

For data analysis purposes, the paper is taking its variable set from the social learning theory, which governs the behavior of the teacher; the pedagogical theory, which governs the whole education process and mechanizes the teachers' efforts; and the students' engagement theory, which governs the experience develops in students due to these effects.

The scope of the paper is being limited to higher education only for a better understanding of the inherent dynamics. A random sample of students is taken from a couple of business and engineering students by distinguishing them into public- and privately-owned universities. Further, a deliberate care has been taken to select (almost) equal number of males and females. A mediated regression analysis, using Baron and Kenny's (1986), Sobel's (1982), and Preacher and Hayes' (2004) approaches, is conducted to establish the mediation role of students' engagement for the presumed direct relationship between teachers' and system's effort and students' development.

It has been established that their traditional direct relationship is due to a mediator which is students' engagement to their classes. This mediation is statistically significant. In other words, the teachers' efforts and performance generate an engagement experience for the student, and it is this experience which motivates students to excel and develop. It has been further established that the mediation is equally effective for both the genders, i.e. gender is not a moderator for the mediation. Further, this mediation is also identical for the two types of students selected for this study. In other words, the mediation is not moderated by the type of students. And the results hold for all types of students. However, the type of school's ownership is a moderator for this mediation; the mediation is not statistically significant for public sector universities. The analysis does show that this may be due to an insignificant relationship between teachers' efforts and the engagement experience developed in the students, and the insignificant relationship between this engagement and development and progress. It is a common observation that publically owned universities attract intelligent students due to their lesser tuition fees, which results in a strictly merit-based admission in these institutions. And these intelligent students think themselves capable enough for their progress and development. However, this is quite farfetched reasoning and requires a separate study for its validation.

The investigation carried out in this paper signifies the role of students' classroom engagement as being a mediator between what a teacher makes efforts for and what actually the students become. It has been established that the students' growth not merely depends upon a teachers' personality, knowledge, assessment-tools, etc., but upon the environment which it manages to make in the classroom.

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