Study of Attitude of B-School Faculty for Learning Management System Implementation an Indian Case Study

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Research Notes

An empirical investigation of student's motivation towards learning quantitative courses

Sonali Singh, Assistant Professor [a], Richa Misra, Associate Professor [a, *], Shalini Srivastava, Professor [b]

[a] Jaipuria Institute of Management, Department of Decision Science and Operations, Noida, India
[b] Jaipuria Institute of Management, Department of Organizational Behaviour, Noida, India

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ABSTRACT

Purpose: In today's data driven economies, the organizations are collecting data from different touch points. However, only a minimal percentage of this data is utilized for effective decision making. The organizations are facing a dearth of skilled professionals who can understand and analyze the huge big-data and convert it into meaningful information. A manager, by using quantitative techniques can change a complicated problem into a manageable one. Keeping this perspective in mind, the curriculum of management studies is designed in order to inculcate and strengthen the analytical skills of the students. The main objective for conducting this study is to gauge the factors responsible for motivating the students to perform in quantitative subjects (Statistics and Research Methods). The study also intends to explore the impact of identified factors on students' motivation towards learning quantitative courses.

Research design: This research is descriptive in nature. The data has been collected from various private Institutes and Universities of India. The empirical study is done through thirty-eight item questionnaire to measure the factors that motivates the student to learn quantitative subjects and inhibit their understanding of quantitative courses. All the students (respondents) have undergone courses on Business Statistics and Research Methods. Convenience sampling is used for collecting data.

Findings: In order to validate the proposed framework statistical techniques like descriptive analysis, factor analysis and multiple regression analysis were used. The result indicates that motivation towards learning of quantitative subjects has a strong relationship with learning value, attitude, learning environment and achievement goals. The study revealed that motivation for learning quantitative subjects has positive and significant relationship with learning value, attitude and learning environment. However, the fourth construct achievement goals has no significant relationship with motivation towards learning quantitative subjects.

Managerial implications: This study is of immense importance for the business schools and universities which could help in addressing the reasons for low inclination towards learning of quantitative subjects, despite growing importance of information based decision making in the corporate world. Although the screening tests like CAT, MAT, XAT etc. have the component of mathematical skills and data analytics, business schools should also assess necessary quantitative ability and skills of the students at the time of admission. Pedagogy and enabling learning environment enhances the learning of quantitative subjects by students.

* Corresponding author.
E-mail addresses: sonali.singh@jaipuria.ac.in (S. Singh), richa.misra@jaipuria.ac.in (R. Misra), shalini.srivastava@jaipuria.ac.in (S. Srivastava).

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1. Introduction

As per AACSB (The Association to Advance Collegiate Schools of Business), India is a country with highest number of institutes in management education. In India, Management education officially started in 1953 with the first B-School incepted by Government of West Bengal and Kolkata University, Indian Institute of Social Welfare and Business Management (IISWBM) (Shweta & Kumar, 2011). As per Indian Management Education: Vision 2025, India has a sixty year older history in Management Education much richer as compared to other countries like China where management education started in 1991. As per the AACSB, (most prestigious accreditation association for business schools), India has five accredited business schools as compared to twenty-five in China (List of Accredited Schools, 2015). In terms of professional skills required, the quality concerns are so depressing that globally researchers in this discipline have concluded to the extent that MBA business programs and their curriculum are major reasons for the shameful quality of management graduates (Ghoshal, 2005; Mintzberg, 2004). Today, India lags behind China and other countries on parameters for quality essentials in management education. Even the top B-school in India like Indian Institute of Management-Ahmedabad, Indian Institute of Management -Bangalore and the like cannot compete with their Asian counterparts in terms of research, accreditation, rankings, admission of foreign students etc. (*Times Higher Education* Asia University Rankings, 2015).

In India, MBA education boom was witnessed in 1990s when the number of B-schools increased exponentially fueled by economic liberalization and subsequent growth of corporate sectors. In this era, management education has come forward as the most alluring course in higher education furthered by an increase in requirement for professional managers. The flip side of the growth is the mushrooming of bottom tier management schools with no clear objectives and direction in education. They were funded and managed by the promoters having no quality background in education. This tier of management school has posed a serious threat on the credibility of management education in India (see Table 1).

Table 1
Number of B-Schools in different countries (Source: MBAuniverse.com analysis).

Country	Total No. Of B-Schools	AACSB Accredited B schools
India	3902	5
China	1082	25
South Korea	240	15
Thailand	108	3
UAE	24	5
Singapore	5	3

The first and foremost task of a manager is to make the right decisions at the right time. They need to respond swiftly in the ever competitive environment. In the current era, business environment is multi-layered and each layer of business has abundant information. It has become more complex for managers to amalgamate the enormous information and to make decision out of it. Here comes the significance of quantitative techniques which provides a tool for systematic and scientific decision making. The quantitative methods help managers to understand the cause and effect relationship between the variables and to measures the associated risks related to basic business operations. It also helps the managers to eradicate individual and orthodox biases which has influenced the decisions taken in the past. Managers and associative statistical information system need to be dependable on each other for making proper decisions.

Contemporary organizations believe in scientific decisions that are supported by the facts and communicated numerically. Quantitative analysis results in data must be gauged and used in aggregation with the information from other sources. Issues related to performance are often raised when employees lack in required technical skills related to their work area (Cooper, 1998). Quantitative techniques aids in probing situation from different perspective and the results may be tested by using scenario modeling or simulation techniques. The decisions must lie at the center of the quantitative techniques. As per EY and Nimbus Ninety report (2015) eighty-one percent of respondents (senior executives across different functional area from United Kingdom) agreed that data should be at the heart of all decision-making.

Many organizations are data rich but they are unable to provide relevant information of the students. If we consider the career perspective, it has been observed that more than 1.2 lakhs students having Engineering/Management/IT degrees are not able to beat the process because of poor analytical and quantitative skills. (Chakraborty, 2014). Management graduates are expected to have a sound understanding of basic mathematics and statistical skills which they need to apply in day-to-day business operations, in their future roles as managers in their respective organizations. Many studies (Bishop, 1989; Ma, 1997; Murmane 1998) have emphasized a positive correlation between expertise in quantitative subjects and performance in job, owing to computational tasks required in most managerial roles. As per the empirical study conducted by Rajanibala and Srivastava (2014) the principal factors deciding the job prospectus of management graduates are analytical skills, general management and work culture, leadership and communication. Decision making, predominantly, at an organizational level is complex and has increasingly become data driven, so in current business scenario, managers should be proficient in extracting the relevant data. Needless to mention, quantitative techniques explain mathematical and statistical models which

are designed to support managers with problem-solving and decision making. An organization could employ a series of quantitative methods, including network analysis, forecasting (regression, path analysis, and time series), optimization (linear programming, assignment, and transportation), sensitivity analysis, significance testing, simulation, benchmarking, and total quality management for analyzing the data. As quantitative analysis focuses on the facts, data, or quantitative characteristics related with problems, the manager who has an understanding of quantitative tools and techniques is in a much better position to analyze the facts and data which might help in reducing the uncertainty in decision making.

In accredited business schools' curriculum, the students are required to take a number of quantitative courses like Business Statistics, Decision Science and Research Methods (AACSB standards, 1991). The coursework in Research Methods has significant implications on their research projects and internship. Faculty members teaching Business Statistics courses during their sessions often face challenges like lack motivation to participate and perform or a preconceived notion of the subject being difficult. A study conducted in Pakistan by Irfan, Awan, Saman, and Hakeem (2012) found that the management institutes experience a higher failure rate of students in quantitative subjects relatively to other subjects both in graduate (BBA) and postgraduate course (MBA). The study identified five major factors that lead to student performance in management courses viz. student aptitude, attitude and behavior, teacher competency, behavior and administrative issues.

Another study was conducted by Yousef (2011), with the objective to analyze the performance of students in management courses. The study investigated the factors with a sample from business students at the United Arab Emirates University (UAEU) and Faculty of Business and Economics (FBE).

In India, especially in post graduate management courses, students are admitted from various disciplines like engineering, science, commerce and humanities. Students confidence level in statistics is found to be associated with the graduation stream or discipline. Student with engineering and science background are found to be more proficient in statistics as compared to students with humanity background (Murugesan, 2011). The findings of Aromolaran, Karim, Ikegwu, Okoroafor, and Ajiboye (2014), on a sample of 300 students of Nigeria Metropolitan College of Technology, explains that a good number of student desired statistics to be removed from their preferred course list, reason being ineffective and conventional teaching pedagogy practiced by the professors. Another major reason of anxiety amongst student is the relationship between understanding of mathematics in graduation and school days with performance in statistics desired in a management course. A blog posted by Asian American literature - Ideas and Common Sense (2014), students from humanities background relatively find it more difficult to understand the quantitative subjects as compared to the students of other discipline. Based on the study of Zulkifli (2013) on management students in Malaysia, the study found that students do not find quantitative courses boring and are likely to develop their interest in these courses if the pedagogical tools used by an instructor are simple and encouraging. Majority of students are able to understand the importance of quantitative subjects as they think the knowledge and analytical skills imbibed in the subjects will be valuable in their future. Mathematical aptitude of students enrolling for management courses has been a subject of concern for a number of years and this issue is exacerbated even more so for the courses in which basic mathematics is a prerequisite. In their study, Mallik and Varua (2008) has emphasized the difference in understanding related to students' aptitude, academic background and interest of the students entering management courses. The studies have also found that the students, who have earlier faced challenges in learning mathematics, continue to find it difficult to learn quantitative subjects. A research found that, anxiety levels are also high for the students who are from non-mathematical background, consequently leading to lowered performance in quantitative subjects (Ganal & Guiab, 2014). For completing their degrees/diplomas, the students are required to attain a minimum grade in all the courses including quantitative course. Nevertheless, some students find it extremely difficult to clear the quantitative courses and hence couldn't complete their degree in time.

Knowledge of statistics and related softwares like Excel, SPSS and SAS etc. facilitate an organization to collect, organize and analyze the data that helps in addressing the questions related to key business problems. With the help of statistical software's, managers acquainted with quantitative techniques, can leverage the enormous volume of customer data captured in the marketing processes (Davenport, 2013).

Conceptual framework was based on previous literature, data was collected through structured questionnaire survey, aiming to understand the factors that develop positive perception for learning quantitative subjects. The paper has explored and investigated the impact of several factors like learning values, attitude, learning environment and achievement goals on motivation for learning quantitative subjects. The participants of study were second-year post graduate management students from different cities of India. The present study indicates that learning values, attitude and learning environment has a significant impact on the motivation of student towards learning of quantitative subjects. Although achievement goals have found to be in positive relation with motivation of student towards learning of quantitative subjects, but did not significantly impacted the same. Fig. 1 shows the hypothetical model for the present study.

1.1. Theoretical background: aligning the study variables with theory of self-efficacy

Self-efficacy is basically a degree of sureness and trust about one's own abilities to complete any task successfully and to attain the desired results. (Bandura, 1986a,b, 1997). Self-efficacy for a person varies from area to area. For example, a student may have high self-efficacy towards the society, and is good at dealing with different people and managing such tasks but may have low academic self-efficacy especially when it comes to the quantitative courses.

Many researches has established the relationship of self-efficacy with learning values, understanding, attitude and achievements of students especially in the courses which are quantitative in nature (Betz & Hackett, 1983; Hackett & Betz,

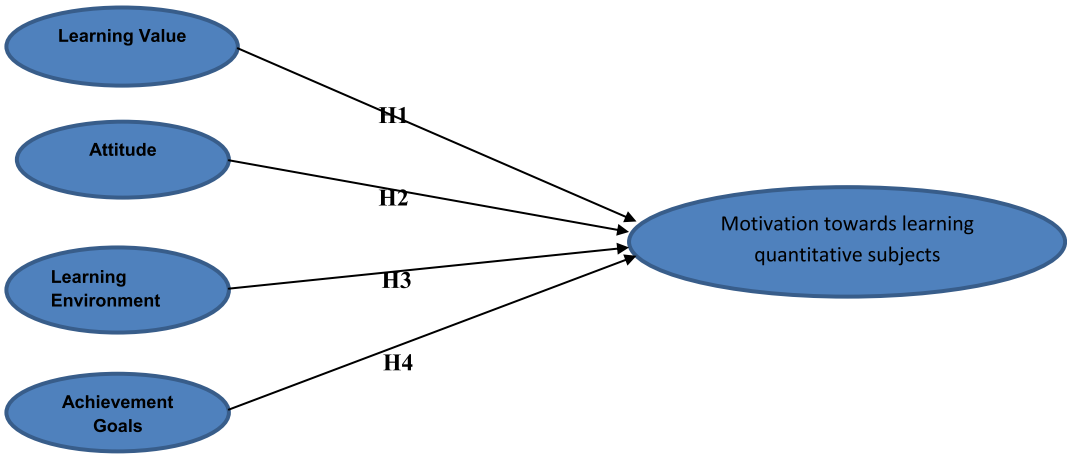

Fig. 1. Hypothesized model.

1989; Hackett, 1985; Pajares & Miller, 1994; Pajares, 1996, 2003; Pajares, Britner, & Valiante, 2000; Zimmerman, 2000). Some other research findings claim that self-efficacy also influences academic motivation of students towards learning of quantitative subjects (Multon, Brown, & Lent, 1991). Although self-efficacy as such is not a part of the current study but is somehow related to all the variables used in this study.

1.2. Learning values

Learning values has a huge impact on motivation towards learning of quantitative subjects. Since students find these quantitative courses difficult, their interest goes down and which in turn affects their understanding (Pajares & Graham, 1999). They are unable to understand its relevance in their professional endeavor. Better learning of these quantitative subjects would help them in improving their aptitude and analytical skills. It also helps in the better understanding of other technical subjects and most importantly progresses their job prospects. When students are not able to establish cause/effect relation between the course in the curriculum and their applicability in the future jobs, they are unable to find interest in learning. Relevance may be contextualized in academics as something that is interesting and has merit in knowing. Even if the course content does not actively engage them, but if students understands the merit of content, they will try their best to learn and perform. Harackiewicz (1979) has conducted empirical testing on 250 high school goers and divided them into two groups; the first group use to maintain notes of the science material they were learning in their lectures on regular basis, and the second group reflected the relevance of the course curriculum to their lives and jobs. In the second group, students who had progressed with low expectations and interest of their success in the course accounted a higher involvement and grades in science than students in the other group which maintained only class notes. Relatedness is a key to student in all age group while utility value is likely to increase importance when students advance in their studies and decide courses that will help them achieving their career goals. Relevance means a student understands how valuable knowledge can be. Relevance is extremely essential to students who are bound to take courses as a part of curriculum, such as general education courses. As far as these quantitative subjects are concerned, it is important for the students to understand the application part of it because simply learning the concepts may not help them in the long run. Along with this, the students are also expected to have expertise in using appropriate softwares. Software allows students to envisage and interrelate with data which in turn improves the understanding of different singularities in such courses (Weissglass & Curnmings, 1991). Using these quantitative tools, also enhances the students' learning about data exploration (Rubin, Rosebery, & Bruce, 1988). A study suggested that mostly students believe that they have control on their academic performance (Dickens and Perry, 1982) and students found their own actions and schedules are responsible for their success or failure in quantitative subjects (Higbee, 1996). Interest of the students in a course has a direct relationship with the understanding of the same. An interesting and involving pedagogical tool used by an instructor often helps in minimizing the difficulty and overall anxiety of students for quantitative courses. Instructors can always encourage the ability of students to appreciate new quantitative concepts and their applications in organization current practices (Wilson, 2001).

The objective of higher education is to develop students' employability. The curriculum is designed in such a way that it motivates students for joining higher education. A survey of school students established that the majority of students indicated the rationale for going to university is 'to study a course that really suits me', together with three career related reasons viz. 'to have a professional career', to improve my job prospects'and 'to gain entrance to a well-paid career' (O'Connor, Bredenkamp, Rutter et al., 1999).

Utility value has purely academic significance and highlights the value that subject curriculum has for the students' future prospects, applicable for both short and long term goals (Ormrod, 2006). For example, quantitative subjects are likely to be

tougher and less attractive to an average student, but for a student who aspires for a consulting and analytics career, quantitative subjects are appealing and have immense utility value. Utility values facilitate students to understand the subject is not only exciting but also has significance in knowing. The instructor need to make students realize how today's lesson will be applicable to them in future. Self-efficacy has a major role in the learning of quantitative subjects. A student would be able to learn these subjects better if they believe they will perform well. Students should therefore be motivated towards self-efficacy for positive learning environment. Similarly, Bandura (1982) also pointed out that supportive learning approaches have twofold outcomes viz. can improve both self-efficacy as well as academic achievement. In a chapter of textbook published in 1994, Albert Bandura mentioned that some conventional instructional rehearses may have an inadvertent effect of weakening the self-efficacy of students who do not belong to the top of the class academically.

H1. There is a significant and positive relationship between deriving value in learning quantitative courses and motivation towards learning quantitative course.

1.3. Attitude

Attitude may be defined as a learning inclination or propensity of an individual to react positively or negatively to some object, situation, theory and concept. It may also be defined as a predisposition of facts towards certain reactions or behaviors (Fishbein & Ajzen, 2010). In technical terms, attitudes are defined as a construct comprising of three important concepts, viz., cognitive, affective and conative. It explains the direction of human behavior towards their purpose (Baker, 1992; Matsuda, 2000). A positive association is found between attitude and motivation towards learning quantitative subjects (Multon et al., 1991).

In a study done by Delcourt and Kinzie (1993), positive attitude towards a subject also demonstrated higher self-efficacy of the student. It is a proven fact that interest towards a particular tasks leads an individual to work harder and invest time to achieve the desired goal (Wentzel, 1998). The same can be related to the students as well. An interest towards a particular subject makes students more focused, dedicated to learn the same. This has been supported by the study done by Pokay and Blumenfeld (1990) who found that students with positive attitude value quantitative subjects and they work hard to achieve better grades.

As cited by many researchers, attitude has been found to play a significant role for success towards learning courses (Brandl, 2002; Desmarais, 2002; Doherty, 2002; Gilbert, 2001; Murday & Ushida, 2002; Warschauer, 1996a, 1996b)

The study conducted by Hemmings and Kay (2010) on Australian secondary school students explored the association between the students' attitude towards mathematics and the efforts placed by them to learn the subject. Positive attitude towards the subject resulted in more amount of effort the students would exert on the subject. Several studies from other disciplines like computers indicated that self-efficacy is associated with the attitude towards the better learning of related subjects like internet application (Delcourt and Kinzie, 1993; Zubrow, 1987). If a student has a positive attitude towards science, computer and mathematics, the student would be more confident towards the learning of quantitative subjects. Mandler's discrepancy theory (1989) talks about negative attitude which says that negative attitude is a consequence of frequent letdowns of planned actions, which were meant to face mathematical tasks. Recurrent emotional reactions for the same would result in the development of an inclusive schema about mathematics and related, which eventually becomes permanent. On the contrary, the positive attitude towards mathematics and other quantitative subject from the childhood would help to develop the self-efficacy of the student.

H2. Positive attitude plays a significant role towards motivation to learn Quantitative courses.

1.4. Learning environment

Learning environment and teaching pedagogies used by an instructor plays a significant role in students' learning (Fencl & Scheel, 2005). Students should therefore, be provided facilities for positive learning environment.

Learning environment consists of faculty teaching competence, class engagement, student–teacher ratio and student–-student interaction, which influences an individual's motivation towards learning (Brophy, 1998; Pintrich & Schunk, 1996). Students will be more likely to be connected in learning when school train them through proper facilities (Brooks & Brooks, 1999).

Learners are observed to be more engaged when they have a personal connect with their faculty as they believe that their teachers are concerned about their academic development in person. Hence, they must get an environment to share their thoughts because if their viewpoint are valued and appreciated, it increases their confidence (Newstreet, 2008, pp. 9–12).

Pedagogical tools used by an instructor may help the students to have a good learning environment which results in improved self-efficacy whereas, some pedagogical tools may challenge students to achieve the realistic short term goals defined by an instructor. It is pertinent for teacher to help students to plan and speak out their learning strategies and keep a track of their improvement (Schunk & Pajares, 2002). It is also important for an instructor to understand that instead of comparing the performance of a student with their peers, compare it with the goals defined for them (Bandura, 1982). Intrinsic motivation takes place when an assessment system raises the student's spirit for abstract learning. Learning

environment and teaching pedagogies used by an instructor do play a significant role in students' self-efficacy (Fencl & Scheel, 2005).

H3. There is a positive and significant association between enabling learning environment and motivation towards learning quantitative courses.

1.5. Achievement goals

Achievement goal includes getting good grades, appreciation by teachers, and recognition in peer group and sense of accomplishment by solving critical problems. To get the best out of their students, teachers have been incentivizing their students for better performance. Stars, grades, appreciation and prizes —all can ignite fires in students to be competitive.

Students feel motivated when they know that other people included teachers around them are concerned and connected. It results in reducing drop out ratio and make them more confident. Similarly, when they relate with their active peer group, they become more engaged and confident (McKay, 2015).

A study by (Freeman, Anderman and Jensen (2007) and Anderman and Leake (2005) students believe that, their sense of be in the right place of learning is encouraged by a teacher who displays kindness and openness, promote students to participate, is energetic, affable and supportive. Student also feels it is important for the teacher to be planned and prepared for the lessons. A supportive teaching style that agrees to student independence may advance student interest, pleasure in learning, commitment and performance. Supportive teacher has the attributes like listening, helping them to solve problem by giving clues and encouragement, being reactive to student questions and considerate for students. (Reeve and Jang, 2006). Students get more motivated when they see a peer doing well in a task. In this perspective, peer means a name that the student relates with, not always the students studying with them (Margolis & McCabe, 2006).

Students will be stimulated and encouraged not only when they are challenged, but also when they can effectively meet the challenges that are given to them. Quantitative subject case studies and application problems based on real data provides student the opportunity to deal with data, analyze data and decision making based on results. The course content further enhances their critical thinking and students feels accomplished after solving problems. A study by Feldman (2007) found that stimulating students interest in the course curriculum has been analyzed as one of the most powerful interpreter of the overall rating of a teacher and one of the most influential predictor of student achievement.

Students are challenged with fresh and stimulating content in these quantitative courses and are expected to be stressed and anxious which is supported by studies which speculated that the students have difficulties and anxiety in quantitative courses (Forte, 1995; Hauff & Fogarty, 1996; Murtonen & Lehtinen, 2003; Onwuegbuzie, Bailey, & Daley, 1999; Onwuegbuzie & Wilson, 2003). The instructor can stimulate interest by presenting students the cases from corporate-world connections as well as by linking students with assignments that enthuse creative application (Perry & Smart, 2007). “The purpose for behavior that are perceived or pursued in a competence-relevant setting” is defined as achievement goals (Midgley, Kaplan, & Middleton, 2001). Elliot and McGregor (2001) prepared a questionnaire for measuring achievement goals through psychometric properties, where they included items which talked about the performance of a student in comparison to their peer group, getting attention of peer group, proving self to be superior in their peer group. Another study suggests that if the students goal towards tasks is performance oriented, they will be more concerned more with performing better as compared to their peers and try to impress their teachers (Brophy, 1998; Pintrich & Schunk, 1996).

There would be an increase in students' motivation when students are more aware about their values and goals (Duffy & Raque-Bogdan, 2010). Intrinsic motivation is positively associated with academic achievement and achievement goals (Lavender, 2005). Achievement goals play a significant role in improving the academic proficiency. If a person is intrinsically motivated, they are determined to accomplish their intrinsic needs for improving their own competence (Deci & Ryan, 1991), and they believe this kind of participation will help them achieve valuable goals (Atkinson & Birch, 1978). As a result, both learning for the joy of learning and learning to gain a peripheral incentive for achievement are established.

Achievement goals play a significant role in improving the academic proficiency. If a person is inherently motivated, they are determined to accomplish their intrinsic needs for improving their own competence (Deci & Ryan, 1991), and they believe this kind of participation will help them achieve valuable goals (Atkinson & Birch, 1978). If the students' goal towards tasks is performance oriented, they will be concerned more with performing better as compared to their peers and try to impress their teachers (Brophy, 1998; Pintrich & Schunk, 1996).

H4. Achievement goal plays a significant and positive role in *motivation towards* learning quantitative courses.

2. Study design

2.1. Sample

The population for the study was second year post graduate management students both in public/private institutes and universities. The reason for selecting second year students was that they had already completed their quantitative courses (Business Statistics and Research Methods) in their first year of programme. The tool for data collection was structured questionnaire. A total of 250 questionnaires were distributed (with the response rate of 63.6%). The data was

collected from 10 major cities of India and the duration of data collection was three months from July to September 2015. The sampling method used was convenient sampling. The sample size of 159 was judged sufficient by the authors as previous other studies also supported similar sample sizes (Mohamed & Waheed, 2011; Rochelle & Dotterweich, 2007). In order to address the common method variance and the social biases such as social desirability biases, Harman's single factor test which involves subjecting all the variables in the study to factor analysis was used (Malhotra, Kim, & Patil, 2006). The first factor did not explain the majority of variance, hence explaining that all the scales were independent of each other.

2.2. About the instrument

The conceptual framework for developing questionnaire has been adapted from Tuan, Chin, and Shieh (2005) which aimed at developing the questionnaire that measures the motivation of students towards the learning of science. Some of the items were deleted, modified or added to the adapted instrument based on their suitability and relevance with respect to the quantitative subjects. The basis for this modification was personal experience of the authors and related literature as mentioned in the subsequent text. Whenever students are given with an evocative learning task, they keenly participate and try to integrate their current understanding with some new ones. But on the other hand, if students are given with a regular learning task, they may lose interest and just try to mug up the concepts (Pintrich & Schunk, 1996). Students with different levels of motivation will also have distinct insights for the learning environment (Huang & Waxman, 1995). As far as quantitative learning values are concerned, it refers to recognize the importance of quantitative learning they are involved in. For the quantitative courses there are some exclusive features such as problem-solving, critical thinking, analytical skills which relates the concepts to their daily life and business situations. When students have set their minds to achieve something, they are motivated within themselves and aim to achieve their goals which also satisfy their intrinsic desire to hone their competency (Deci & Ryan, 1991). Hanrahan (1998) studied that teacher, pedagogy used by teacher in classroom, relations between student and teacher would also impact the motivation towards learning of a particular course. The survey questionnaire was finalized only after the discussions with four expert instructors teaching similar subjects in reputed institutes in Delhi NCR region, India.

Before using questionnaire for the final survey, pilot study was conducted on a small cross-sectional data obtained from the first 30 students. Pilot test analysis includes the detailed comparison of data obtained for each student with other responses. This is to further ensure the reliability and also guarantees the rightness of the instrument, language and acceptability among the respondents.

The first part of questionnaire contains items measuring motivation, learning environment stimulation, learning values, involvement, and impact of faculty, attitude, recognition, achievement goals and performance goals. The second part of the questionnaire contains background details about the respondent.

Motivation of the student plays a crucial role in learning and understanding quantitative subjects. Students were asked to state their agreement and disagreement on five-point Likert scale (strongly disagree-1, disagree-2, neutral-3, agree-4, strongly agree-5) on a set of statements related to various motivational factors and inhibiting factors related to learning of quantitative subjects.

As far as the questions on Motivation towards learning quantitative courses are concerned, the present study borrowed 6 questions from Intrinsic Motivation Inventory (IMI) which were selected as per the relevance of the present study. IMI inventory has been used by McAuley, Kunkel, and Acton (1987); Plant and Ryan (1985) and Ryan, Stiller, and Lynch (1994) thus confirming high validity. The six questions were related to dimensions like interests, understanding, importance, pressure, value and relationship. The items were measured on a five point likert scale ranging from strongly agree to disagree. Studies done in the past have stressed that entry or withdrawal of any scale/items will not impact the purpose (Ryan, 1991).

As acknowledged by Messick (1989), content validity and construct validity needs to be addressed for administering a questionnaire. Content validity states the amount by which a measure symbolizes all aspects of a certain paradigm. For establishing content validity, literature from the published work was used. the opinions obtained from the discussions with the instructors teaching similar courses were used to validate the items included in questionnaire. Factor analysis was used to ensure construct validity. Cronbach Alpha was used to assess the reliability of the scale used which is found to be 0.87.

2.3. Data analysis and results

It is evident from Table 2, that the majority of survey respondents were males while only one-third were females. Most of the respondents had no work experience, had a commerce background and were doing specialization in Marketing/Sales.

2.4. EFA

Exploratory factor analysis was conducted on 38 variables using principal component analysis with varimax rotation method. Eigen value greater than 1 was considered as a cut off point for the number of factors extracted. The result indicated KMO statistics value of 0.833 and Barlett's test of Sphericity was significant, which indicated appropriateness of extracted variable for factor analysis. The analysis eventually resulted in the selection of four factors. The factors explained a total of

Table 2
Demographic characteristics of respondents.

Demographics	Frequencies	Percentage
Gender		
Male	110	69.18
Female	49	30.82
Work Experience		
Yes	44	27.67
No	115	72.33
Academic Background		
Science	40	25.16
Humanities	6	3.77
Commerce	84	52.83
Engineering	29	18.24
Specialization		
Marketing/Sales	76	47.80
Finance	42	26.42
Operations/IT	19	11.95
HR	14	8.81
IB	4	2.52
Entrepreneurship	4	2.52

Source: Authors' survey

50.87 percent of the total variance explained by the model. The rotated component matrix was used, using 0.40 as cut off point for factor loading for naming the factors.

2.5. Reliability analysis

Reliability was carried out to identify internal consistency among the items of each sub-scale which were derived from the EFA. The criterion of 0.70 and above was adopted to select or drop the entire sub-scale (Nunnally, 1978). Result of Table 4 indicates that Cronbach's α values ranged from 0.760 to 0.882 indicating the statistical adequacy of the selected scales. Such a criterion of reliability is commonly adopted in other scale development studies (e.g. Hinkin, 1998).

After conducting EFA, 37 items were extracted to explore the underlying dimensions of student's motivation towards learning a quantitative course. Results of EFA are shown in Table 3. The variables with lower factor loading were removed. Only those factors were considered that has the minimum Cronbach alpha value of 0.6. The factors were named as Learning values, Attitude, Learning environment and Achievement goals.

Multiple linear regression test using standard regression method was carried out to uncover the predictors which explain the motivation towards learning quantitative courses according to the level of importance as depicted in Fig. 2.

Based on the results, the Multiple Linear Regression model with four predictors of Learning Values, Attitude, Learning Environment and Achievement Goals have worked well in explaining the motivation towards learning quantitative courses ($F = 5.413$; d. f. $= 4$; $p = 0.000$). From Table 5, learning value derived from the course was found to exert significant positive influence on the motivation towards learning quantitative courses ($p = 0.018$; $\beta = 0.242$), hence proving the first hypothesis. The relationship of attitude to the motivation towards learning quantitative courses was also found to be positive and significant ($p = 0.035$; $\beta = 0.181$). Hence the second hypothesis is also accepted. The third hypothesis of the study that learning environment has a positive and significant influence on motivation towards learning quantitative courses ($p = 0.003$, $\beta = 0.281$) is also accepted. Although the fourth predictor achievement goal is important for the motivating the students but it does not hold significant relationship with the motivation towards learning quantitative courses in the present study ($p = 0.471$, $\beta = 0.066$).

3. Discussion & suggestions

The present paper findings and evidence from the literature suggest that student quantitative skills and attitude plays a crucial role in the successful completion of the course as well as in developing the skills like problem solving and critical thinking required to grow in today's competitive business environment. The results from EFA found four predictors which motivates students towards learning the quantitative subjects. The first factor Learning Values showed a positive and significant correlation with motivation towards learning the quantitative subjects, hence proving the first hypothesis of the study. Learning Values explains the skills and value attained by students when they learn quantitative subjects as well as sense of achievement when they solve challenging problems. The Utility value has purely academic significance and highlights the value that subject curriculum has for the students' future prospects, applicable for both short and long term goals (Ormrod, 2006). The second hypothesis of the study was proved when Attitude reflected a positive association with motivation to learn quantitative subjects. Attitude explains the confidence and the motivation within an individual to learn and understand quantitative subjects. The result is supported by the study done in the past by Thorndike-Christ (1991) who emphasized that attitude and interest level determines the student's intention of student to study quantitative subjects.

Table 3
Factor Analysis results: Motivation toward learning quantitative courses.

Factors	Measurements	Factor Loading	Eigen Value
Learning Value (14)	With my hard work and help of others I can do well in the subject.	0.443	9.296
	Learning Quantitative subjects is important for professional life.	0.529	
	Quantitative subjects improve my aptitude skill.	0.440	
	Understanding of Quantitative subjects facilitates my learning in other technical subjects.	0.695	
	Learning Quantitative subjects gives a better understanding of business and economics.	0.712	
	Learning quantitative subjects through Excel/SPSS/SAS/Minitab/R provides me better job prospects.	0.444	
	It satisfies me when I attain good scores in Quantitative courses.	0.722	
	I feel satisfied when I am confident about the content of the course.	0.670	
	I feel a sense of accomplishment when I am able to solve most difficult problems.	0.760	
	I feel a sense of achievement when my fellow students accept my views.	0.418	
	Acceptance of my views by a faculty makes me contended.	0.469	
	I find Quantitative course content being exciting and challenging.	0.520	
	Different pedagogical tools make me actively participate in the course.	0.600	
	Reasonable work load by a faculty leads me to better understanding of the course.	0.474	
Attitude (8)	I am not confident in understanding difficult Quantitative concepts.	0.443	5.005
	I am sure that I can do well in Quantitative subjects.	0.594	
	No matter how much effort I put in, I cannot learn Quantitative concepts.	0.780	
	When some portion of the course is difficult, I give up and only do the easy parts.	0.676	
	During the Quantitative classes, I prefer to ask other students for the solutions rather than solving on my own.	0.535	
	When I find Quantitative concept difficult, I do not put any effort to learn it.	0.753	
	I am comfortable with the Quantitative subjects.	0.557	
	Despite of having ample time, I cannot understand Quantitative subjects.	0.763	
Learning Environment (7)	I participate in Quantitative courses because it is challenging.	0.463	2.005
	Quantitative course involves experiential learning through lot of discussions.	0.634	
	I participate in Quantitative courses as teacher has knowledge and expertise in the subject.	0.558	
	Query handling by faculty makes my learning more participative.	0.455	
	I participate in Quantitative courses as the institute provides tutorial classes for the same.	0.711	
	I participate in Quantitative courses as I gain lots of hands on experience.	0.536	
	The batch size affects my learning the quantitative concepts.	0.595	
Achievement Goals (8)	I like Quantitative subjects because it stimulates my critical thinking.	0.401	1.916
	Quantitative subjects provide me with the opportunity to satisfy my curiosity.	0.522	
	I participate in Quantitative subjects to get good grades.	0.629	
	I participate in Quantitative subjects to perform better than other students.	0.730	
	I participate in Quantitative subjects so that other students think that I am smart.	0.717	
	I participate in Quantitative subjects so that the teacher pays attention to me.	0.671	
	I participate in Quantitative courses as teacher pays attention to me.	0.467	
	I participate in Quantitative courses as teacher has knowledge and expertise in the subject.	0.417	

Table 4
Mean, SD, Correlation and Reliability Analysis of the study variables.

S.No	Variables	Mean	SD	Learning Values	Attitude	Learning Environment	Achievement Goals
1	Learning Values	3.29	0.52	0.862	–	–	–
2	Attitude	3.04	0.73	0.355**	0.840	–	–
3	Learning Environment	3.50	0.66	0.517**	0.053	0.826	–
4	Achievement Goals	2.90	0.60	0.420**	−0.111	0.466**	0.760

Note: **p < 0.01 (1% level of significance).
Source: Authors' survey; factor reliability is explained diagonally

Table 5
Regression analysis.

Hypothesis	Independent variable	Dependent variable	Beta	R^2(Adjusted R^2)	F-Value
H1	Learning Values	Motivation towards learning quantitative subjects	0.242**	0.123 (0.100)	5.413***
H2	Attitude		0.181**		
H3	Learning Environment		0.281***		
H4	Achievement Goals		0.066		

Note: ***p < 0.01 (1% level of significance); **p < 0.05 (5% level of significance).
Source: Authors' survey

Learning Environment which includes the batch size, tutorial class, pedagogy and extra attention and tutorial provided to students to enhance their understanding also, reflected a positive association with motivation to learn quantitative subjects, hence proving the third hypothesis of the study. Faculty plays an important role in motivating students towards learning

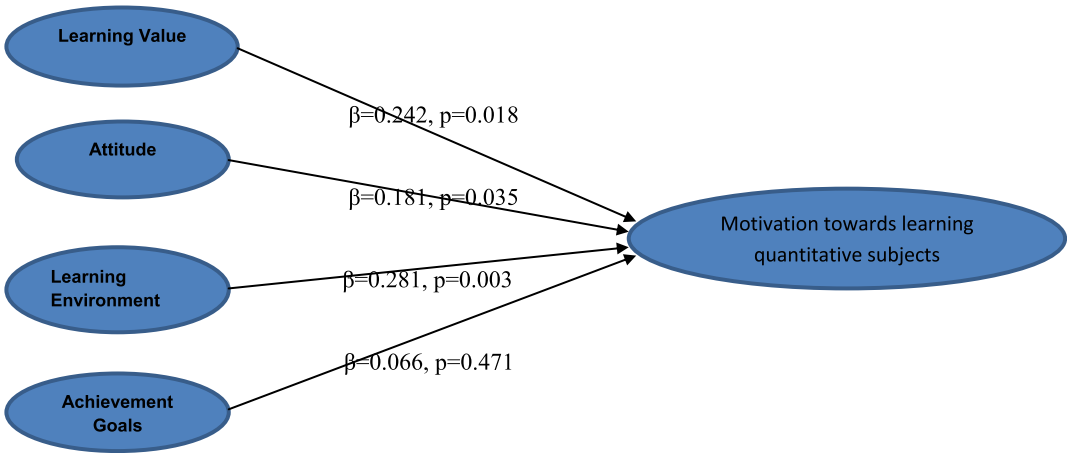

Fig. 2. Research model.

quantitative courses. One way to improve the learning in quantitative courses could be to provide students with the basic course on mathematics as a prerequisite of quantitative courses, so that the students with diverse academic background start with the same level of understanding. Organising tutorial sessions where students can clear their doubts can be the other way to motivate the students to learn quantitative courses. Previous studies also came out with the same opinion. Teacher's attitude, facilitation of mathematical thinking, facilitation of learning, course organization and effective assessment also reflected a students' motivation to learn quantitative courses. (Beswick, 2006; Swan et al., 2000; Wilkins & Brand, 2004). Achievement Goals, the fourth factor which explains the benefits in terms of better grades and how quantitative aptitude facilitates understanding in other related subjects showed no significant association with motivation to learn quantitative subjects thus, rejecting the fourth hypothesis of the study.

3.1. Implication for management institutes

At managerial level, the study presents empirical evidence representing attitude, learning environment and learning value as strongs predictor of performance in quantitative courses. In addition, an enabling environment further enhances motivation of learning. Hence, management of universities must reflect on these factors when determining probable changes to increase students' performance.

The study has a number of propositions for academic administrators. The study will provide administrators a list of factor that motivates students to learn quantitative subjects which will there by, help administrators' to devise effectual plans to increase students' learning experience and in turn improve their overall performance. As Business Statistics put emphasis on application of statistical techniques to business situations through critical thinking, awareness of these underlying factors can provide a basis for improving student performance in Business Statistics. For the better learning of quantitative courses, students are required to involve themselves in self-study and peer-learning. Business Schools have to think about including refresher courses on basic mathematics and statistical concepts for students who have a passive inclination towards mathematics and statistics. If an academic administrator wants to increase the demand and viability of the course, University/institute imparting higher education need to design the curriculum keeping in mind the aspiration of the students as well as relevance of the course. Despite the fact that challenges remain, researchers and academicians are conducting quantitative and qualitative experiments intended to recognize and scale the most efficient strategies for improving student motivation towards learning quantitative courses.

3.2. Limitation and directions for future research

The study will serve as a base for future in-depth studies, in this domain of research where a limited study has been published. However, the present study has certain limitations. First, the sample size of the study is 159; the sample for the study represents ten cities of India. With the limited sample size, the generalization of results might be questionable. Second, this study focuses only on business management post graduate students and is not able to measure the perception of other students who also take quantitative courses from the disciplines viz., engineering graduates who might have different perception. Further research can also be done which may include other variables as moderators like, no of absenteeism in the class, final GPA in the subject, performance and the relationship between them to explain motivation of students in learning quantitative subjects. The study may also incorporate working management professional who have dealt with real management issues and appreciate the importance of data analysis in decision making. This will help in knowing the difference in

perception based on experience. To further validate the factors extracted in the study and to describe the adequacy of the model proposed the confirmatory factor analysis may also be conducted.

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