
Influence of Student Engagement on Learning Gains

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This study conducted with the responses of 1100 undergraduate students of management classes drawn from five institutions of a private university located in National Capital Region of India attempts to determine if the empirical data supports the six-factor structure of student engagement. Then goes on to test through a structural equation model the twelve hypothesized influences of six student engagement factors on the two learning gains. The result showed that only two factors 'effective teaching practices' and 'supportive environment' significantly influence both the outcomes of 'critical thinking' and 'socio-cultural skills'. Implications of the research have been discussed and directions for future research outlined.

Keywords: Higher education, learning gains, structural equation modelling, student engagement, undergraduate management

INTRODUCTION

The student outcomes of learning and personal development are influenced by the degree to which an institute can channelize the efforts of students towards performing educationally purposeful activities (Astin, 1993; Pascarella & Terenzini, 1991; Pace, 1980). The institutional practices such as active and collaborative learning, student faculty interactions, enriching educational environment, supportive campus, discussions with diversity, are known to lead to higher levels of student engagement (Astin, 1991; Chickering & Reisser, 1993; Kuh, Schuh, Whitt & et.al, 2005; Pascarella & Terenzini, 1991). Chickering and Gamson (1987) had prescribed seven principles of good practices in undergraduate management education that foster higher level of student engagement and learning. These principles include student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations and, respect for diverse talents and ways of learning. Institutes that are educationally more effective in adding value direct students' energies towards appropriate activities to engage them at fruitfully. Based on the learning outcomes, such institutes can claim to be of higher quality as compared to other similar institutes. The successful institutes ensure creation and maintenance of an environment which leads to engaged student. An engaged student co-creates better learning with the faculty and peers (Singh & Srivastava, 2014; Saha, 2014).

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In traditional teaching, teacher delivers lectures, assesses student for the ability to memorize course materials, as per curriculum defined by institution, by granting grades (Hartel & Gardiner, 2003). A student's approach to rote learning resembles a "banking model" where teacher deposits knowledge in empty mind of a student through didactic lectures, which student draws when required (Cook-Sather 1997; Bain, 2004, Hartel, 2002). In the recent literature such teacher centric learning approaches has been challenged on the basis of validity of learning provided to the student. Education should be in the form of holistic learning to define overall development of student's personality, creating positive influence on the way they think, act, and feel (Bain, 2004). Learning in education institution should be a synergistic process of mutual interaction between student and teacher in varied problem based environment, leading to creation of new knowledge and skills in the students to face real world issues (Cook-Sather, 1997). The goals of lifelong learning in the students can be achieved by practicing outcome based learning approaches (Gainen & Locatelli, 1995; Bowyer, 1996). The outcomes of the student engagement activities can be measured in the form of learning gains (Diamond 1998; Palomba & Banta 1999).

PURPOSE OF THE STUDY

The present study first determined the factor structure of the student engagement and then examined the influence of these factors on the learning gains for undergraduate management students.

THEORETICAL FRAMEWORKS

The theoretical framework for study had been derived from the work of Kuh, (2001, 2003) who had given student engagement theory. Kuh provided a framework for this study, since it defined that student engagement i.e. educational purposeful activities had influences on learning gains. Kuh had

proposed student engagement theory by consolidation of work of previous research like Astin's (1987, 1993, 1996, 1999, 2003) theory of involvement and I-E-O theory, Chickering and Gamson's (1987) seven principles for good practice in undergraduate education, and Pace's (1980, 1984) quality of effort measures to establish student engagement theory. Engagement theory differs from involvement theory that it defines various educational purposeful activities institution designed to engage the student to have desired student outcomes in the form of learning and development.

REVIEW OF LITERATURE

This section is divided in three parts. The first part reviewed the important literature covering student engagement. The second part dealt with learning gains split into three sections - general education, personal and social development and practical competence. The third part focused on the relationships of student engagement indicators with learning gains.

Student Engagement

The student engagement is an multidimensional construct had been discussed in the higher education to enhance student learning quality for many decades. (Astin, 1977, 1984, 1996; Astin & Panos, 1969; Kuh, 1981, 2001, 2004; Kuh & et al., 1991; Pace, 1979, 1982, 1984; Pike, 1991). The student had been a passive participant in the learning process which is dependent on college environment, but Pace (1964, 1982) emphasizes, the student themselves are responsible for their success, which had been defined by time invested by them in various academic and extracurricular activities of the institution.. Pace proposed that the quality of effort results into quality of learning for student (Pace, 1984). Astin's (1984; 1991; 1993) theory of student involvement suggests that students who are more invested in their college experience are more likely to be successful in college. Astin (1984) who had propounded the student

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involvement theory, defined investment as the amount of physical and psychological energy invested by the student in the institutional activities of engagement. (p. 297). At the beginning of 21st century, Kuh and others (Hu & Kuh, 2001; Kuh, 2001, 2003; Kuh et al., 2001) defined certain process indicators, that measure student engagement and its influence on the learning gains. Kuh, (2001), defined the student engagement as a construct to measure the time and energy committed by the student in the institutional environment, which enhance and guide their learning and development.

Student engagement activities, had been grouped as five benchmarks defined student interactions with academic activities like attending lectures, interaction with peers and faculty members, access and usage of various academic resources like library, labs, tutoring services, quality of relationships with various campus socialization agents, participations in various activities of club and committees for curricular and extra-curricular development, writing and reading for preparations of various assignment, participation in discussion on the various diversity, semester abroad program, competitions and vocational activities. (Kuh, 2001). The five benchmarks measured into five different, though inter related construct of student engagement with their institution (Campbell & Cabrera, 2011). These benchmarks are level of academic challenges, active and collaborative learning, enriching educational experiences, student-faculty interactions and supportive campus environment.

Measures of student engagement are often called process indicators of institutional quality. Even with rich evidence of outcomes, institutions still need to know which programs, processes, activities, and student efforts produced those outcomes (Banta, 2002; Kuh, Pace, & Vesper, 1997). Perhaps the best known list of process indicators is the Seven Principles for Good Practice in Undergraduate Education (Chickering & Gamson, 1987, 1999).

These principles call for institutions to deliver their programs and services to shape student behavior in desired directions. They include student-faculty contact, cooperation among students, active learning, prompt feedback from faculty members, time on task, high expectations, and respect for diverse talents and ways of learning. All are believed to be highly associated with student success in a variety of ways.

Pike, 2006 had reconstructed five benchmarks into 12 scalelets that measured engagement. Gordon, Ludlum, and Hoey (2008), found marginal improvement in the Pike 12 scalelets over five structure benchmarks in terms of predictive validity. All scalelets had alpha value less than .7. The study conducted by LaNasa, Cabrera, and Transgrud (2009), five factor structure NSSE Model failed to fit sample data drawn from first year student cohort. They identified eight factor model by confirmatory factor analysis. The model shows better fit of data. The other study conducted at research intensive university by Campbell and Cabrera (2011) results too do support factor structure of student engagement scale. Hence it had been concluded institutions should examine the reliability and validity of NSSE benchmarks before analyzing any data for policy change. A study conducted at research intensive university Tendhar, Culver and Burge (2013), five factor model did not fit the data. Hence a revised model using six factors instead of five factors had been proposed. This model show better fit sample data of the university.

The findings of these studies emphasized that the five factor structure of student engagement is not applicable for measuring engagement student all types of student, institution and student characteristics. The conclusion drawn is that the five factor model had to be explored for the fit of model for data of study. In the light of recent studies, the first research goal of this study is to examine the factor structure of student engagement for undergraduate students of five institution of private university in India.

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Learning gains

Learning gain is defined in the form of outcome of a student's performance across stages of study periods in terms of skills and competencies, content knowledge and personal development. Generic skills are defined as those which are not subject – specific, such as critical thinking, analytical reasoning, problem solving, and written communication. Personal Development can be characterized by the acquisition of a level of maturity in a student's moral or personal reflection.

Gains in General Education

The syllabus of the first year of undergraduate management covers only the core courses. These core courses are focused on laying foundation for pursuing specialization courses and help in developing general understanding of student for interdisciplinary nature of management courses. The courses taught in first semester of undergraduate management program include the general management practices, economics for understanding general business environment, information technology, language and, English communication. In second semester students are taught social awareness and empathy to community, behavioral sciences, and basic statistics and mathematics. It is expected that these courses will help a student understand differences in the various economic indicators, understand and interpret human behavior, evaluate different processes to select the suitable one, appreciate the process of marketing and selling that lead to customer satisfaction and be able to take financial decisions in the context of a firm. (Astin,1993).

Gains in Personal and Social Development

In this gain, the student's ability to interact with peers and society had been measured in the form of self-awareness, autonomy, confidence, social competence and sense of purpose of meaningful life. Student develops a sense of appreciation and gratification for self and others. This gains associate with student success in working as team as well as

independently.(Irungu,2010).A longitudinal study conducted by Kuh(1999), had concluded student engagement activities had guided student towards self –sufficiency and civic responsibility, improved communication towards society. Terenzini et .al 2003 corroborated Kuh's conclusion. They too found student engagement activities are positively related with gains in personal and social development.

Gains in Practical Competence

A positive relationship has been found by Terenzini(1995) between critical thinking ability and the number of courses that required writing skills; interdisciplinary courses pursued; having class papers reviewed by instructors; and discussing racial and ethnic issues. Many of the similar involvement items has shown positive relationship with Astin's Overall Academic Development Factor which include ability to think critically, analytical and problem –solving skills, general knowledge, knowledge of specialized field or discipline, and writing skills. The development of intellectual skills is a commonly researched outcome of the first year experience (Cuseo, 2000; Gardner, Barefoot, & Swing, 2001; Moody, 1993; Schilling, 2000).

The development of intellectual skills, is an important outcome to be researched for the first year experience of undergraduate student (Cuseo,2000; Gardner, Bafrefoot, & Swing 2001; Moody, 1993; Schilling, 2000). The communication skills have been found to be positively related to student's involvement in discussion of racial or ethical issues(Astin,1993).While there is a negative relationship between communication skills and the involvement of a student taking remedial courses and receiving tutoring (Astin,1993).

RESEARCH QUESTIONS

A research question is the fundamental core of a research project, study, or review of literature. It narrows down the focus of the study, determines the methodology, and guides all stages of inquiry,

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analysis, and reporting. This study, to be conducted on the undergraduate students of management, will be guided by following research questions:

1. Does a six factor structure of student engagement model fit the empirical data?
2. Do the factors of engagement influence the learning gains of students?

RESEARCH OBJECTIVES

The objectives of the study were formulated as below:

1. To determine the factor structure of student engagement that fits the data.
2. To find out the influence of factors of student engagement on the learning gains?

RESEARCH METHODS

The participants of the study consisted of second year and third year students of a three year undergraduate management degree course of a private university located in National Capital Region. The five institutions teaching management program were selected to draw sample. The selection of institution was based on uniform academic criteria.

Sampling technique

Stratified random sampling method had been used for sampling. The selection of institution was based on homogeneity of population on the basis of courses studied in same semester and heterogeneity in different semester, which fulfills the criterion of stratified random sampling. The stratification variable is semester pursued in the first stage and section of student in second stage. Within a section participation of a student was voluntary. Attempt had made that more than 90% of students in a section do participate.

Sampling Unit

The sampling unit and the element of study was

the students of a three-year undergraduate management program studying in second and third years. Sampling frame to draw sample is the enrollment list provided by each institution.

In each section there were 40 students. Total numbers of sections selected were 20-25, giving the sample size of about 800 to 1000. Proportionate allocation across different strata was followed. That is, the size of the sample within a stratum should be proportional to the total size of the stratum.

Data collection method and instrument

The data were collected by using structured self-administered questionnaire. To capture good quality response each respondent was allowed at least 30-50 minutes to fill questionnaire in the paper form.

The questionnaire adapted from NSSE scale for Student Engagement. The adapted survey for study had six factors of student engagement and two factors of learning gains. For most of the questions four points Likert scale was used.

DATA ANALYSIS

Data collected through survey had been compiled and analyzed. During pilot study phase mean, standard deviation, correlation and t - test used to clean and organize the data. Missing values were checked and wherever it occurred, the respondent was deleted from the data base. Exploratory Factor Analysis (EFA) determined the underline factor structures. Confirmatory Factor Analysis (CFA) used to test the extent of shared variance. Convergent validity assesses by average variance extracted (AVE), value of each construct must be greater than 0.5 (Hair et. al. 2010). Composite reliability (CR) value for each construct must be greater than or equal to 0.6 (Awang, 2015), or less than 0.7 (Hair et al.,2010). Before applying CFA data were tested for linearity, collinearity, normality and homoscedasticity. Structural Equation Modelling tested if the hypothesized relationships hold true for the collected sample. All data collected were

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analyzed with appropriate software (IBM SPSS version 20 and AMOS version 20).

RESULTS

An exploratory factor analysis was performed on questionnaire responses using the principal component analysis with varimax rotation to explore the factor structure that would emerge from data. The initial result revealed potential 11 factors had eigen values greater than 1. Item loadings on the factors were then examined and items with cross-loadings on factors were eliminated from the analyses. For the purposes of the study, items were retained if their primary factor loading was at least .50 with no cross-loading of .30 or above. Through this process, 24 items were removed, and further analysis of the remaining 18 items resulted in the six factors, explaining 60.89% of the variance. These factors were labeled (1) Quality of Relationships (qip), with five items (2) Writing (w) with three items, (3) Discussion with diversity with 3 items, (4) Supporting Environment (Se) with 3 items, (5) Effective teaching Practices (ept) with 3 items and (6) High Impact practices (hip) with 2 items. The similar process had given 2 factor structure of learning gains. The factors labelled as critical thinking and Socio Cultural skills. All construct value exceed the critical levels of 0.7 and 0.5 for composite reliabilities and average variance extracted respectively. (See Table 1). This establishes the reliability, convergent and discriminant validity of measurement scales.

Formulating Hypotheses

After confirming six factors of student engagement and two factors of learning gains, the second research question was expanded and converted into following two sets of nested hypotheses with six hypotheses in each set.

H₁: The six student engagement factors produce significant influences on critical thinking

H₁₁: Quality of Relationships

H₁₂: Writing significantly

H₁₃: Discussion with Diversity

H₁₄: Supportive Campus

H₁₅: Effective teaching practices

H₁₆: High Impact practices

H₂: The six student engagement factors produce significant influences on socio cultural skills

H₂₁: Quality of Relationships

H₂₂: Writing significantly

H₂₃: Discussion with Diversity

H₂₄: Supportive Campus

H₂₅: Effective teaching practices

H₂₆: High Impact practices

In order to ascertain whether the student engagement model fits the observed data, Comparative Fit Indices (CFI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA) and SRMR (standardized root mean square residual) were calculated. Bentler (1990) has suggested the following threshold values for these variables for accepting the model: (i) $CMIN/df < 3$, (ii) $SRMR \leq .08$, (iii) $CFI > 0.90$, (iv) $RMSEA < 0.05$, (v) $p\text{-value} > 0.05$, and (vi) $GFI > 0.90$. The measurement model of student engagement six factor indicated a good model fit with GFI (0.962), CFI (0.923), RMSEA (0.045) and SRMR (0.033) within acceptable range.

Hypothesis Testing

In order to test the hypotheses and find the influences of student engagement on two learning gains; the structural equation modeling was used. Goodness-fit-statistics for model show a Comparative Fit index (CFI) of .945, just at the standard cut off point indicating a good (>.90), but not strong (>.95) fit, and Goodness of fit index (GFI) is .964, shows strong fit of model (Bentler, 1990, Byrne, 1994). The Root Mean Squared error of approximation (RMSEA) is .034, and standardized root mean residual (SRMR) is .04 indicate a good fit (Boomsa, 2000).

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Table 1 : Student Engagement Factors, Composite Reliabilities, Average Variance Extracted, Component Items, and Factor Loadings		
Q.No.	Quality of Relationships(qip) [CR = .817, AVE = .612]*	Loadings
8.3	The quality of your interactions with the Faculty	.806
8.4	The quality of your interactions with the Student service staff(Career services, student activities, housing etc.)	.797
8.2	The quality of your interactions with the Academic advisors	.788
8.5	The quality of your interactions with the administrative services staff and offices(Registrar,Accounts,Clinic etc.)	.751
8.6	The quality of your interactions with the Program leaders	.738
	Writing (w)[CR = .813 , AVE = .592]*	
4.4	16 pages-20pages	.804
4.5	more than 20 pages	.796
4.3	11 pages-15 pages	.704
	Discussion with Diversity (dd)[CR = .706 ,AVE = .547]*	
5.1	People of a race or ethnicity other than your own	.786
5.3	People with religious beliefs other than your own	.759
5.2	People from an economic background other than your own	.708
	Supporting Environment(se)[CR = .769,AVE = .527]*	
7.6	Providing support for your overall well-being (recreation, health care, counseling, etc.)	.768
7.4	Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.)	.711
7.5	Providing opportunities to be involved socially	.696
	Effective teaching Practices (ept)[CR = .739,AVE = .529]*	
3.2	Taught course session in an organized way	.785
3.3	Used examples or illustrations to explain difficult points	.746
	High Impact practices(hip) [CR = .706 ,AVE = .527]*	
6.6	Complete a culminating senior experience (BSI course, term project or thesis, comprehensive exam, portfolio, etc.)	.773
6.2	Hold a formal leadership role in a student organization or group	.704
	Critical thinking (cri) [CR = .765 , AVE = .522]*	
9.1.	Writing clearly and effectively	.769
9.2	Speaking clearly and effectively	.767
9.3.	Thinking critically and analytically	.622
	Socio-Cultural Skills(soc)[CR = .747 , AVE =.514]*	
9.8	Understanding people of other backgrounds (economic, racial/ethnic, political, religious, nationality, etc.)	.686
9.9.	Solving complex real-world problems	.614
9.10	Being an informed and active citizen	.807

*CR= Composite Reliability , AVE = Average Variance Extracted

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Table 2 : Standardized Total Effect on learning gains						
	Ept	Wr	dd	Hip	se	qr
soc	.352	-.014	.129	.243	.295	-.081
cri	.463	.070	.091	.069	.313	.013

Moreover, the results demonstrate that there are only four individual paths that produce significant influences on learning gains ($p < .05$). The two paths of student engagement factor i.e. effective teaching practice had significant influences on socio-cultural skills (.352 Standardized points) critical thinking (.463 Standardized points). The two paths of another student engagement factor i.e. Supportive environment, had significant influences on socio-cultural skills (.295 standard units) and critical thinking (.313) standard units. (Table 2 & Figure 1).

Hypothesis H_{14} , H_{15} , H_{24} , and H_{25} were statistically significant. Hence only 4 hypotheses were accepted for the discussion out of 12 hypothesis (Figure 1).

Table 3 : Variable name and Description	
Variable Name	Variable Description
Ept	Effective teaching
Wr	Writing Assignment
Dd	Diversity Discussion
Hip	High Impact practices
Se	Supportive Environment
Qr	Quality of relationship
Soc	Socio-Personal Skills
Cri	Critical thinking

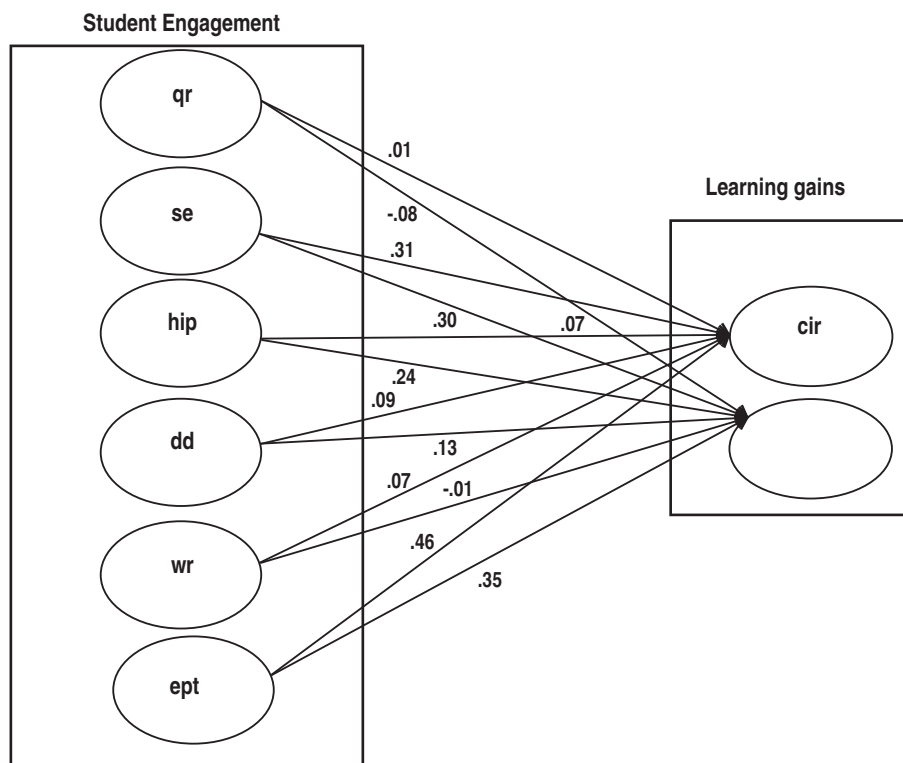


Figure 1: Student Engagement factors influences on Learning Gains

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DISCUSSION

The relationship of effective teaching practice and student gains at course level is extensive (Pascarella & Terezini, 1999, 2005). The faculty conduction of course such as use of class time, session organization, explanations of course objectives, positively related with student learning gains (Pascarella, Edison, Nora, Hagedorn, & Braxton, 1996). The student across discipline appreciate and learn more from the class of the faculty who is organized and give clear instruction (Hativa & Birenbaum, 2000). The pedagogies such as classroom discussions, group, project, internships, peer-tutoring, service learning, field trips foster learning and support learning gains such as critical thinking and socio cultural skills. (Kuh et al. 2005). Active and collaborative learning which engages student outside and inside classroom learning leads to develop problem solving and decision making skills. Student who engaged with group projects and group presentation, they interact more enhancing their inter personal skills (Zhao & Kuh, 2004). In this research Effective teaching practices have significant influences on learning gains. In the model significant relationship is between effective teaching practices and critical thinking and socio cultural skills. Since results showing influence of effective teaching practice is immense, the faculty should bring innovative methods for class room student engagement, giving group projects, doing field visits, and enhancing on content of course curriculum to make more student centric.

Supportive Environment impact on gain in learning and intellectual development is immense (Kizer & Kinzie, 2006; Pascarella & Terezini, 2005; Pike & Kuh, 2006). The relationship between supportive environment and growth and development is been established (Kuh & Hu, 2001). The institution should work on creating positive environment for student by providing better outside classroom opportunities leading student involvement, which is directly contribute on

changing student perception, create in the student a sense of the belonging and satisfaction. This in turn foster a positive impacts on students 'self-reported gains in the learning. (Kuh & Hu, 2001). The student who engaged themselves in using physical and non-physical facilities and opportunities that institution provides result into academic, personal and social development and understanding. (Pace, 1984). Supportive environment facilities such as libraries, classroom, cultural, recreational and athletic are physical facilities. The opportunities of supportive environment are contact time with faculty and peer, involvement in clubs and organization, informal dialogues on different topics, personal and interpersonal experience, as well as academic experience in and outside classroom. The present study empirical evidence showing significant influence of supportive environment on student learning gains. The path analysis between supportive campus and critical thinking and socio-cultural skills is significant. The institution in order to engage student in fruitful learning should focus on enhancing physical and non-physical facilities which will enhance student skills for job and for life.

CONCLUSION

The present study reveals six factor structure for student engagement indicator as independent construct. The learning gains is having two factor structure, which is defined as dependent factor for the study. The current study uses the statistical method of structure equation modelling in providing an empirical explanation between the relationship of student engagement factors such as effective teaching practice and supportive environment and critical thinking and socio-cultural skills.

The present study 12 paths are found in model. Out of the 12 paths only four paths showing relationships between student engagements and learning gains are significantly influencing. The two factor ie. Effective teaching practice and supportive environment shows significant influences on

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learning gains. Hence, it concluded, if institution focused and invest more on delivery by efficient faculty, who use innovative pedagogies to enhance skills and competence of student. The support environment should work synergistically to improve learning gains of student.

FUTURE DIRECTION OF STUDY

By revealing the factor that predicts high amount of student engagement in the undergraduate student, in particular, by outlining, such factors that increases student engagement in undergraduate management student, the present study makes a significant contribution both in theoretical and practical framework of the phenomenon. A qualitative study to understand the various underpinning layers for student engagement can be conducted by future researcher. In qualitative study researcher can identify why student tend to more engaged in some activities and not in others (Kinzie and Pennipede, 2009). Future research could focus on the university further to measure the effect of individual benchmarks, or specific items within the benchmark in order to learn in detail effect of specific activities on learning gains. The study had been conducted on sample drawn from undergraduate management student. The future researcher can focus on different sample of postgraduate management student and management research student. This will enlightened new aspects of student engagement applicable for postgraduate and research student.

REFERENCES

- Astin, A. W. (1977). *Four critical years*. San Francisco: Jossey-Bass.
- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, 25, 297-307.
- Astin, A. W. (1987). Chapter 6: Student Involvement: The Key to Effective Education. In *Achieving Educational Excellence*. San Francisco: Jossey-Bass.
- Astin, A. W. (1991). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education*. Washington/New York: American Council on Education and Macmillan Publishing Co.
- Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Astin, A. (1996). Studying college impact. In F.K. Stage, G.L. Anaya, J.P. Bean, D.Hossler & G. D. Kuh (Eds.), *College Students: The evolving nature of research* (pp.66-79). *Ashe Reader Series: Pearson Custom Publishing*.
- Astin, A. W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 37(2).
- Astin, A.W (1999). Student involvement: A development theory for higher education. *Journal of College Student Development*, 40(4), 518-529.
- Astin, A. (2003). Involvement in learning revisited: Lessons we have learned. In F. K.Stage, D. F. Carter, Hossler, D. & E. P. St. John (Eds.), *Theoretical Perspectives on College Students*. (pp. 499-509). *ASHE Reader Series: Pearson Custom Publishing*
- Astin, A. W., & Panos, R. J. (1969). *The educational and vocational development of college students*. Washington: American Council on Education
- Awang, Z. (2015). *SEM made simple: a gentle approach to learning Structural Equation Modelling*. Bandar BaruBangi: MPWS Rich Publication
- Bain K. 2004. *What the best college teachers do*. Cambridge, Mass.: Harvard Univ. Press. 207 p.
- Banta, T. W. (2002). Characteristics of effective outcomes assessment: Foundations and examples. In T. W. Banta (Ed.), *Building a scholarship of assessment* (pp. 261-283). San Francisco: Jossey-Bass
- Boomsma, A. (2000). Reporting analyses of covariance structures. *Structural Equation modelling*, 7(3), 461-83.
- Bowyer K. 1996. Efforts to continually improve a nursing program. In: Banta TW, Lund JP, Black KE, Oblander FW, editors. *Assessment in practice: putting principles to work on college campuses*. San Francisco, Calif.: Jossey-Bass. p 128-9
- Campbell, C. M., & Cabrera, A, F. (2011). How sound is NSSE? Investigating the psychometric properties of NSSE at a public, research-extensive institution. *The Review of Higher Education*, 35(1), 77-103. <http://dx.doi.org/10.1353/rhe.2011.0035>
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3-7.
- Chickering, A. W., & Gamson, Z. F. (1999). Development and adaptations of the seven principles for good practice in undergraduate education. *New Directions for Teaching and Learning*, Winter, 75-81
- Chickering, A.W. and Gamson, Z.F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3-7.
- Cook-Sather A. 1997. *Making connections: the brain and the creation of optimal learning opportunities for student*. Bryn Mawr College, Pa.: Serendip. Available from:

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- http://serendip.brynmawr.edu/sci_edu/cooksather.html. Accessed 2005 Nov 15.
- Cuseo, J. B. (2000). Assessment of the first-year experience: Six significant questions. Retrieved November 15, 2003, from www.brevard.edu/fyc/listserv/remarks/cuseo600.htm
- Diamond RM. 1998. Designing and assessing courses and curricula: a practical guide. San Francisco, Calif.: Jossey-Bass.
- Gainen J, Locatelli P. 1995. Assessment for the new curriculum: a guide for professional accounting programs. Sarasota, Fla.: American Accounting Assn. 158 p
- Gardner, J. N., Barefoot, B. O., & Swing, R. L. (2001). Guidelines for evaluating the first-year experience at four-year colleges (2nd ed.). Columbia, SC: National Resource Center for The First-Year Experience and Students in Transition, University of South Carolina
- Gordon, J., Ludlum, J., & Hoey, J. J. (2008). Validating NSSE against student outcomes: Are they related? *Research in Higher Education*, 49, 19-39. <http://dx.doi.org/10.1007/s11162-007-9061-8>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Englewood Cliffs: Prentice Hall.
- Hartel RW, Gardiner D. 2003. Making the transition to a food science curriculum based on assessment of learning outcomes. *J Food Sci Educ* 2:32-9.
- Hartel RW. 2002. Core competencies in food science: background information on the development of the IFT Education Standards. *J Food Sci Educ* 1:3-5.
- Hativa, N., & Birenbaum, M. (2000). Who prefers what? Disciplinary differences in students' preferred approaches to teaching and learning styles. *Research in Higher Education*, 41(2), 209-236.
- Hooper, D., Coughlan, J. & Mullen, M. (2008). Structural equation modelling: guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53-60.
- Hu, L. T. & Bentler, P. M. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation modelling*, 6(1), 1-55.
- Hu, S., & Kuh, G. D. (2001). Being (dis)engaged in educationally purposeful activities: The influences of student and institutional characteristics. *Research in Higher Education*, 43(5), 555-575.
- Irunge, J. N. (2010). The Relationship Between Engagement And Perceived Academic, Personal, And Social Outcomes For Senior International Undergraduate Students In Research Universities, Thesis, School of Education and the Graduate Faculty of the University of Kansas
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press
- Kinzie, J. & Pennipede, B. S. (2009). Converting engagement results into action. In R. M. Gonyea & G. D. Kuh (Eds.), *Using NSSE in institutional research*, *New Directions for Institutional Research*, 142, 83-106.
- Kuh, G. D. (1999). How are we doing? Tracking the quality of the undergraduate experience, 1960s to the present. *The Review of Higher Education* 22(2), 99-120.
- Kuh, G. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, May/June, 10-18.
- Kuh, G. (2003). How are we doing at engaging students? *About Campus*, 8(1), 9-16.
- Kuh, G. D. (2001). *The National Survey of Student Engagement: Conceptual framework and overview of psychometric properties*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- Kuh, G. D. (2006). Making students matter. In J. C. Burke (Ed.), *Fixing the fragmented University: Decentralization with direction*. (pp. 235-264). Boston, MA: Jossey-Bass.
- Kuh, G. D., & et al. (1991, November). The influence of student effort, college environments, and campus culture on undergraduate student learning and personal development. Paper presented at the Association for the Study of Higher Education, Boston.
- Kuh, G. D., Pace, C. R., & Vesper, N. (1997). The development of process indicators to estimate student gains associated with good practices in undergraduate education. *Research in Higher Education*, 38(4), 435-454
- Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J. (2005). *Assessing conditions to enhance educational effectiveness: Inventory for student engagement and success*. San Francisco, Jossey-Bass.
- Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J. & Associates (2005). *Student Success in College: Creating conditions that matter*. San Francisco: Jossey-Bass Publishers.
- Kezar, A. & Kinzie, J. (2006). Examining the ways institutions can create student engagement: The role of mission. *Journal of College Student Development*, 47(2), 149-172.
- LaNasa, S., Cabrera, A. F., & Trangsrud, H. (2009). The construct validity of student engagement: A confirmatory factor analysis. *Research in Higher Education*, 50, 313-352. <http://dx.doi.org/10.1007/s11162-009-9123-1>
- Moody, R. (1993). Motivation, learning strategies, and personality. *Journal of the Freshman Year Experience*, 5(1), 37-75
- Pace, C. R. (1964). The influence of academic and student subcultures in college and university environments. Los Angeles: University of California.
- Pace, C. R. (1979). *Measuring outcomes of college. Fifty years of findings and recommendations for the future*. San Francisco: Jossey-Bass.
- Pace, C. R. (1980). Measuring the quality of student effort. *Current Issues in Higher Education*, 2, 10-16

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Pace, C. R. (1982, May). Achievement and the quality of student effort. Paper presented at the National Commission on Excellence in Education, Washington, DC.

Pace, C. R. (1984). Measuring the quality of college student experiences. An account of the development and use of the college student experiences questionnaire. Los Angeles: Higher Education Research

Pascarella, E., Edison, M., Nora, A., Hagedorn, L., & Braxton, J. (1996). Effects of teacher organization/preparation and teacher skill/clarity on general cognitive skills in college. *Journal of College Student Development*, 37, 7-19.

Pascarella, E. T., & Terenzini, P. T. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco, CA: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). How college affects students: A third decade of research (Vol. 2). San Francisco, CA: Jossey-Bass

Pike, G. R. (1991). The effects of background, coursework, and involvement on students' grades and satisfaction. *Research in Higher Education*, 32(1), 15-30.

Pike, G. R., & Kuh, G. D. (2006). Relationships among structural diversity, informal peer interactions and perceptions of the campus environment. *The Review of Higher Education*, 29(4), 425-450.

Saha, G. G. (2014). Student Engagement: A Strategic Tool to Reform the Quality of Management Education. *The SIJ Transactions on Industrial, Financial & Business Management (IFBM)*, 2(3), 153-157.

Singh, A. K., & Srivastava, S. (2014). Development and Validation of Student Engagement Scale in the Indian Context. *Global Business Review*, 15(3), 505-515. <http://doi.org/10.1177/0972150914535137>

Tendhar, C., Culver, S.M & Penny L. Burgel, P.L. (2013). Validating the National Survey of Student Engagement (NSSE) at a Research-Intensive University, *Journal of Education and Training Studies* Vol. (1)No. (1) ,ISSN 2324-805X ,E-ISSN 2324-8068

Terenzini, P. T. (1995). Influences affecting the development of students' critical thinking skills. *Research in Higher Education*, 36(1), 23-39.

Terenzini, P.T., Pascarella, E.T., and Blimling, G.S. (2003). Students' out-of-class experiences and their influence on learning and cognitive development: A literature review. In F.K. Stage et al. (Eds.), (pp. 455-468) *ASHE Reader: Theoretical perspectives on college students*, Boston: Pearson Custom Publishing

Schilling, K. L. (2000). First year job description. Retrieved 2/16/16, 2016, from <http://www.brevard.edu/fyc/listserv/remarks/schilling.htm>

Zhao, C.-M., & Kuh, G. D. (2004). Adding Value: Learning communities and student engagement. *Research in Higher Education*, 45(2), 115-138.

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