Confirmatory Factor

Analysis of Faculty Retention in Technical Institutions

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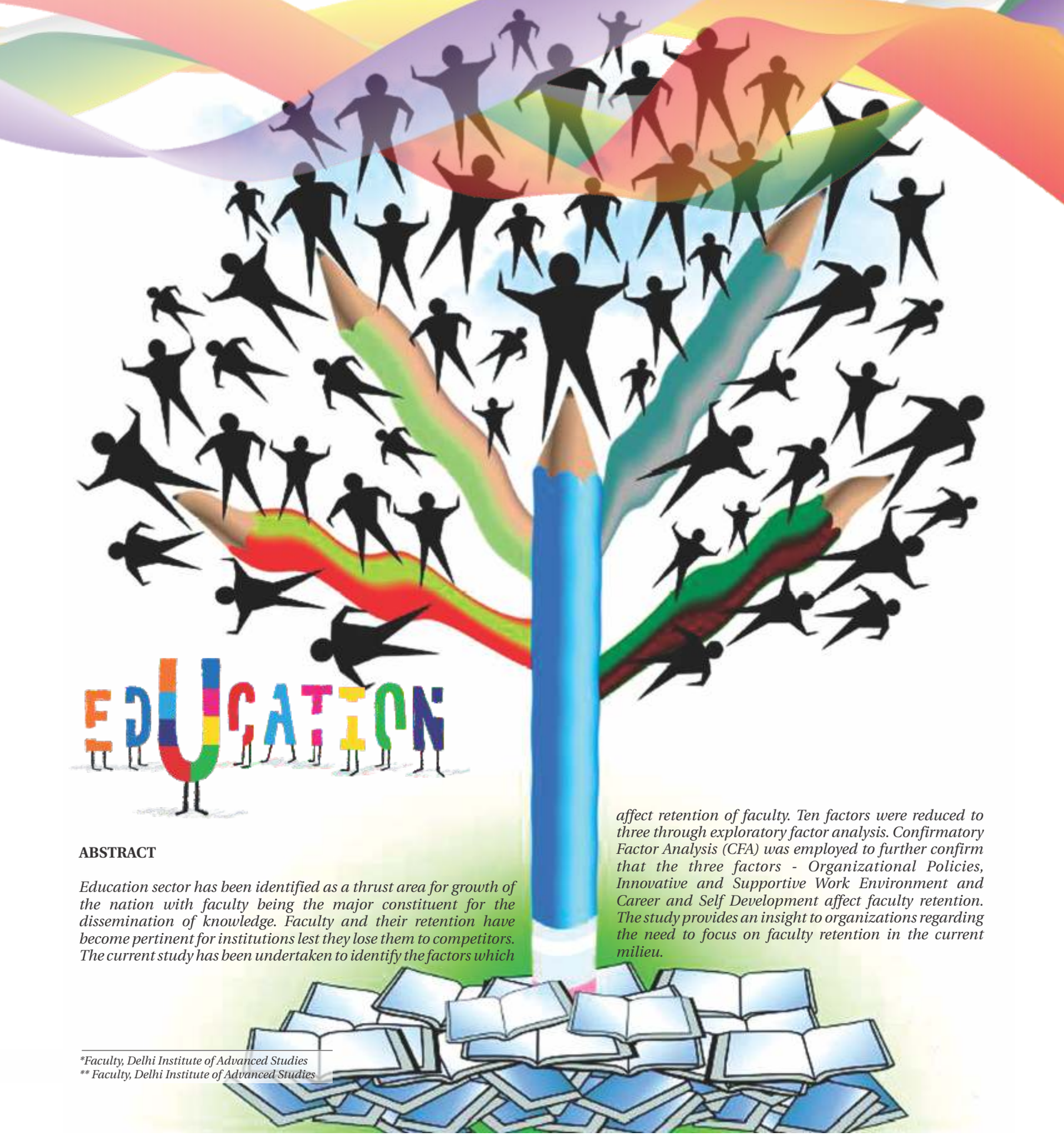

ABSTRACT

Education sector has been identified as a thrust area for growth of the nation with faculty being the major constituent for the dissemination of knowledge. Faculty and their retention have become pertinent for institutions lest they lose them to competitors. The current study has been undertaken to identify the factors which affect retention of faculty. Ten factors were reduced to three through exploratory factor analysis. Confirmatory Factor Analysis (CFA) was employed to further confirm that the three factors - Organizational Policies, Innovative and Supportive Work Environment and Career and Self Development affect faculty retention. The study provides an insight to organizations regarding the need to focus on faculty retention in the current milieu.

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INTRODUCTION

The economic advancement of a country is strongly associated with Excellence in Education. The endeavor of higher education scheme is sustainable expansion for appropriate creation, transmission and dissemination of knowledge and skills for gainful employment. India has one of the largest systems of higher education in the world, offering facilities of education and training in almost all aspects of human creativity and intellectual endeavor. With majority of the population below the age of 25, focus on higher education becomes imperative. The higher education comprises of general education and technical/professional education, the former mainly consists of courses in arts, science and commerce while the latter includes education, research and training in the areas of engineering, technology, architecture, town planning, management, pharmacy and applied arts and crafts. Higher education in India has witnessed an impressive growth over the years. According to UGC Higher Education at a Glance June- 2012 Report, the number Higher Educational Institutions (HEIs) has increased from 30 universities and 700 colleges in 1950-51 to 634 universities and 33,200 colleges in the year 2010-11. The annual enrolment of above 25 million students inclusive of open and distance learning system, propels India to the third position in the countries offering higher education system. With the public expenditure remaining close to 1% of the Gross Domestic Product (GDP), the private sector has stepped in to fill the increasing requirements of this sector. Their numbers have seen a 60% increase during the 2007 and 2012 period.

Excellence in Higher Education to a large extent is determined by the faculty and their quality characterizes the brand of the teaching programmes and research offered. Faculty with good academic credentials and drive for excellence can outshine in teaching and research. Thus faculty is more important than facilities and infrastructure, even though the latter is also necessary for the survival of institutions. There exists a mismatch between the number of faculty available and the student enrolment. The student enrolment has increased from 397,000 in 1950-51 to 16,975,000 in 2010-11, while the corresponding increase in the number of teachers for the same period has been 23,549 to 816,966.

Faculty shortages and the failure of the educational institutions to attract and retain well-qualified teachers has been a major challenge to reckon with for many years. A study by the National Skill Development Corporation (NSDC) has estimated that an augmented requirement of about 3,171,000 educators in higher education between 2008 and 2022 is being seen to ensure 1:20 faculty student ratio resulting in more than three-fold increase in the number of educators present in the system. Hence attracting and retaining faculty need to be focused upon by institutions if they ought to stay in competition. The current paper undertakes to study the various factors affecting the retention of faculty in technical institutions.

ITERATURE REVIEW

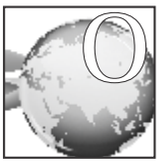
Teacher's data from North Carolina and Michigan was analyzed by Murnane et al. (1991). They identified that teachers working in school districts that paid comparatively high salaries stayed longer than teachers who were offered low salaries. Teachers who received low salaries were, one and a half times as likely to leave teaching after the first year on the job as compared to teachers who received high salaries. They also established that compensation had major effect on the duration of a teacher's first term in teaching for primary teachers, in comparison to secondary teachers. Akila (2012) revealed that employee retention can be increased by providing regular feedback for resolving employee grievances, problems and stress management.

Dolton and Von Der Klaauw (1995) examined 923 individuals in UK, all of whom who took to teaching as their first job. They identified that, with an across-the-board increase of 10 percent in teacher salaries, there was an associated nine percent reduction in the probability of teachers exiting the profession after five years. Further Boe et al. (1997) examined teachers' career decisions one year after the initial survey was administered and found that salary positively and significantly predicted retention for special and general education teachers at all levels of experience. Ballou and Podgursky (1997) identified some flaws in across-the-board pay raise model. Kirby, Berends, and Naftel (1999) determined that an increase of $1,000 in salary reduces attrition rate of teachers by 2.9 percent.

Stinebrickner (2001) examined the effect of pay on teacher's retention in professional institutions and concluded that, with higher income, the total number of years spent in teaching would increase from 0.50 (of the total years possible for work in one's life) to 0.80. Also higher salaries were, on an average, associated with a longer stay in teaching during the first nine years. Feiman- Nemser, (2001) suggested that quality of mentoring had little impact on new teacher's retention. Several studies suggested that induction was also related to new teacher retention. Smith and Ingersoll (2001) found that large number of workings provided during the induction to new teachers reduces the predicted chances of leaving. Tye and O'Brien (2002) tracked the graduates of a large teacher education program wherein the respondents who had already left teaching ranked the pressures of increased accountability (high-stakes testing, test preparation, and standards) as the most important reason for leaving, while respondents who were still teaching but reported they would consider leaving, ranked paperwork and accountability pressures, high- second and third, respectively. Buckley, Schneider, and Shang (2004) suggested that spending money to improve facilities (one-time expense) would have greater impact on teacher retention than increase in pay. Johnson et.al (2004) identified that professional development, new roles, and career ladders were three potential ways to bolster retention efforts.

According to Ingersoll & Kralik, (2004), well-conceived, carefully implemented, soundly supported, mentoring and induction showed positive affect on retention. Hausknecht (2008) listed major 12 retention factors published in the literature over the last 60 years from 24,829 employees in leisure and hospitality industry of US, they were: .Job satisfaction, Extrinsic rewards, Constitution attachments, Organizational commitment, Organizational prestige, Lack of alternatives, Investments Perceptions about the length of service to the organization, Advancement opportunities,

Location, Organizational justice, Flexible work arrangement, Non-work influences. According to Samuel and Chipunza (2009), the major objective of retention was to prevent the loss of skilled recruits from leaving the organization as this could have adverse effect on productivity and profitability. According to Budhwar et al. (2009), the success of a service organization depended on their ability to attract and retain high quality employees. Rehman, S. (2012) revealed that more psychologically satisfied employees remained in organization and also helped to attract new talent pool. According to Brigitte Kroon and Charissa Freese (2013) work experience, career development and independence were some of the major reasons for employees to stay in the organization. Gaurav Bagga (2013) posited that clear career path in the organization helped in long employee tenure.



BJECTIVE OF THE STUDY

- To explore and confirm the factors responsible for retention of faculty in technical institutions.

RESEARCH DESIGN

A structured questionnaire was designed to collect the data. Different factors were identified through exploratory study of literature and validity of the questionnaire was checked through face validity. Fifteen factors were selected as constructs for the survey, they are:

Author, Year	Factors Reviewed	Dimensions Identified
Darling-Hammond (2003), Guarino et al (2006), McGrath & Princiotta (2005)	Safe Environments, Firm Administrative Leadership, Colleagues' Cooperation, and Necessary Learning Resources	Work Excitement(A1), Relationship with Colleagues and Supervisors (A3)
Chen et al, (2006) Luthans, (1998)	Work Itself, Pay, Supervision, Co-Workers, and Promotion	
Hay (1999), Samuel & Chipunza (2009), Hequet (1993)	Training and Development	Adequate Career Planning (A2), Ample Opportunity provided for Recognition (A5), Challenges Involved in the Job (A13)
Bradley et al (2004), Ballot et al (2006)	Job Specific Training, On-Going Learning, Training at Workplace, Latest Pedagogical Tools	
Laden & Hagedorn (2000) Olsen et al (1995) Rosser, (2005) Tack and Patitu (1992)	Morale, Institutional Fit, Institutional Support, Autonomy, Promotion and Tenure	Fit with Organization Culture (A7), Flexibility in Approach, Encouraged to Innovate (A9), Fair Compensation Supportive and Approachable Management (A4), Extent of Participation in Decision Making (A11)
Comm & Mathaisel (2000), Zuber (2001)	Work Load, Working Environment and Pay & Benefits, Flexible Timing Offered	Great Work Environment (A8), Presence of Work Life Balance (A12)
Rockwell (1999)	Reward, Support and Institutional Research	Value and Reputation (A6)
Olsen, (1993)	Morale, Rank, Tenure Status, Increased Work Hours on Administrative Tasks, University Support, University Structure, and The Institutional Reward System	
Betts (1998)	Job Security, Career Exploration, Over all Job Satisfaction, Opportunity to Diversify Teaching	Job Security (A10)
Zaini, Nilufar and Syed (2009)	Training and Development, Team Work, HR Planning, and Performance Appraisal	Regular Appraisal (A14), Use of Proper Method of Appraisal (A15)
Olson (1986)	Cognitive Appraisal	

SAMPLE PROFILE

The list of approved Technical Institutions by the All India Council for Technical Education Technical Institutions

(AICTE) in Delhi and NCR was procured from the AICTE's website. The combined list had 284 institutions. This list was considered for the sampling frame. Elements of sampling were faculty. The data was collected by contacting them personally. Questionnaires were also sent through e-mails.

Questionnaires were sent to approximately 900 faculty members and out of the received questionnaires, 452 were found usable. The sampling technique applied in selecting the institutes was simple random sampling. There were many institutes with no professors or limited number of associate professors that led to unequal ratio in the final sample. The sample distribution was as follows:

Table 1: The Sample Distribution of Study Based on Responses of Faculty

Gender	Males	177
	Females	275
Age	Less than 25 Years	56
	25-Less than 35 Years	252
	35- Less Than 45 Years	118
	45 years and above	26
Marital Status	Married	350
	Unmarried	102
Education Qualification	Graduate	11
	Post Graduate	228
	Doctorate	64
	NET Qualified	130
	Doctorate + NET	19
Current Designation	Assistant Professor	336
	Associate Professor	82
	Professor	19

STATISTICAL TOOLS

Factor analysis is a multivariate statistical process that decreases a large number of variables into a smaller set of variables. It ascertains underlying dimensions between measured variables and latent constructs, thus allowing the construction and refinement of theory. It provides construct validity of self-reporting scales. The Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are considered as the two major modules of factor analysis. In EFA, the number or nature of the variables is not known and it provides an opportunity to explore the dimensions to create a theory, or model from a large set of latent constructs whereas, in CFA testing of an anticipated theory, or model is permissible. CFA also has assumptions and expectations based on priori theory regarding the number of factors that offer best model fit.

DATA ANALYSIS

Exploratory factor analysis was applied to develop a tool for measuring the perception of faculty on retention strategies adopted by the institutes using SPSS V 17. For this pool of 15 items comprising of Work Excitement (A1), Adequate Career Planning (A2), Relationship with Colleagues and Supervisors (A3), Fair Compensation Supportive and Approachable Management (A4), Ample Opportunity provided for Recognition (A5), Value and Reputation (A6), Fit with Organization Culture (A7), Great Work Environment (A8), Flexibility in Approach , also Encouraged to Innovate (A9), Job Security (A10), Extent of Participation in Decision Making (A11), Presence of Work Life Balance (A12), Challenges Involved in the Job (A13), Regular Appraisal (A14) and Use of Proper Method of Appraisal (A15) were selected on the basis of review of literature as mentioned above. The data on these items was collected on a 5 point likert scale.

The factors were reduced through exploratory factor analysis from fifteen to ten. Principal component analysis was used with varimax rotation. The correlations between factors and the different items expressed by means of the factorial loads were significant. The Kaiser- Meyer-Olkin measure of sampling adequacy came out to be 0.882 with chi- square value of Bartlett's Test of Sphericity being significant (chi sq= 1515.663, p= .000). This implies that the factor analysis was acceptable. The factor analysis generated three components with eigenvalues above 1. The factor loadings along with Cronbach alpha values for the three components have been shown in Table 2.

Table 2: Rotated Component Matrix

	Components		
	1	2	3
A14	0.818		
A15	0.764		
A11	0.632		
A12	0.573		
A7		0.845	
A10		0.682	
A9		0.629	
A8		0.596	
A1			0.843
A2			0.766
Reliability- Cronbach Alpha	0.771	0.791	0.688

On the basis of exploratory factor analysis a diagram depicting the preliminary measurement model was designed. The model displayed ten measured indicator variables and three latent variables which were subjected to CFA with AMOS V21. The latent variables were identified as

(1) Organizational Policies consisting of Extent of Participation in Decision Making (A11), Presence of Work Life Balance (A12), Challenges Involved in the Job (A13), Regular Appraisal (A14)

(2) Innovative and Supportive Work Environment comprising of Fit with Organization Culture (A7), Great Work Environment (A8), Flexibility in Approach , Encouraged to Innovate (A9), Job security (A10) and

(3) Career and Self Development containing Work Excitement (A1) Adequate Career Planning (A2).

The principal task in CFA model was to determine the goodness of t between the hypothesized model and model determined by the sample data. The adequacy of model t was evaluated using the Chi square statistic, Confirmatory Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). Preliminary model did not provide a good fit for the data (Figure 1), with value of CFI being 0.836 (Chi square value

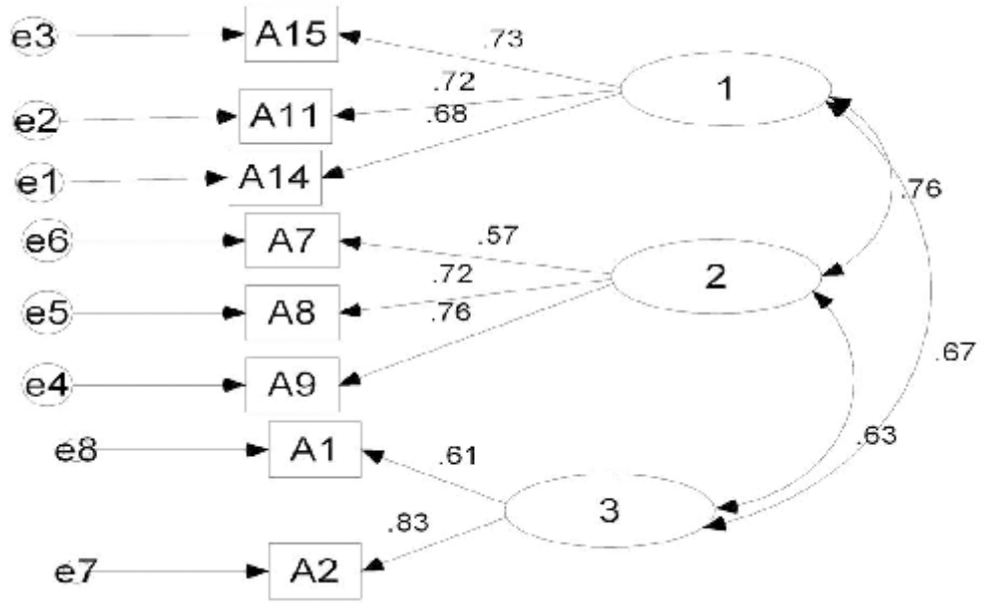


Figure 1: Preliminary Model

of 86.3 with p = 0.000).

Hence the preliminary model was amended to improve the model fit. Modification indices and standardized residuals calculated through AMOS V 21 was used to modify the model resulting in the final model (Figure 2).

The final model was significantly better fit in comparison to the preliminary model with Chi Square value = 31.5915, p=0.00046825. The CFI for the final model was 0.9762, indicating that the model provided a good fit. Other indices also indicated a good fit (CMIN=3.159, RMR= 0.0247, GFI=0.9802, RMSEA=0.069, PCLOSE=0.1080). All the indicators had moderate to strong standardized factor loadings ranging from 0.51 for A7 to 0.94 for A9. Squared multiple correlations provided information about the extent of variance of observed variables the factor can account for. The R2 statistics was found highest at 0.5184 for A11, 0.8836 for A9 and 0.6889 for A2 corresponding to all the three latent variables identified in the final model. It can be stated that Career Planning, Innovation and Participation in Decision Making contribute the most to faculty retention. Hence institutions should provide opportunities for growth and development of faculty and involve them as strategic partners in order to achieve the institutions goals and objectives.

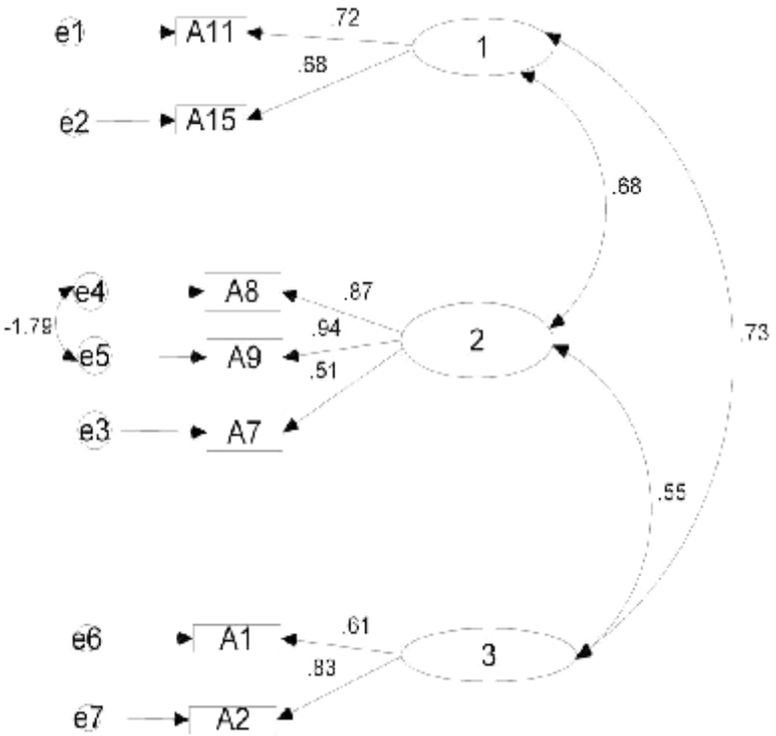
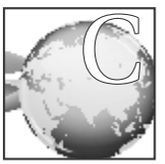


Figure 2: Final Model



ONCLUSION

In the current times focus for institutions has to be on retaining their competent faculty. The costs incurred by the institutions are high and frequent turnover of faculty results in increase in both direct and indirect costs. Hence the human resource policies in the institutions should foster employee retention. The current study revealed that retention of faculty can be enhanced by providing a clear set of Organizational Policies along with Innovative and Supportive Work Environment and adequate Career and Self Development plans. Study undertaken by Kumar and Dhamodharan (2013) also suggest that Challenging Assignments, Remuneration & Recognition, and Opportunities to learn new things, Infrastructure, Potential Talent and the Prospective Roles can aid in employee retention. Further, Malati et al (2013) observed that Work Environment; Training & Development, Compensation and Role of HOD show a positive impact on faculty retention.

The institutions ought to comprehend that with growing demand for experienced faculty, their retention will become a pertinent issue for the organizations as competent faculty has become a prized possession. Hence, sooner organizations plan a retention policy and put it in place the better it would be for their long term sustenance.

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