CAMPUS ADAPTATIONS BY AGE COHORT

Vijayalakshmi N. S. and A. H. Sequeira

Objective: The study aims to empirically test the relationship between types of campus adaptations across different age levels of engineering undergraduate B.Tech students pursuing a four year study at Indian Institute of Technology (IIT's) and National Institute of Technology (NIT's) in India.

Method: The Multivariate Analysis of Variance (Manova) test was run with SPSS vs. 21 to compare the student's age groups between 18 - 24 on different dimensions of campus adaptations of IIT's and NIT's. The sample of 1385 students was selected using multistage random sampling method.

Results: In academic adaptations the age groups of 18, 19, 23 and 24 had a positive outcome and age groups of 20, 21 and 22 had a negative outcome. In social adaptation age groups of 18, 21, 22, 23 and 24 had positive outcome and age groups of 19 and 20 had negative outcome. In physical - psychological adaptation age groups of 18, 19, 21 and 23 had positive outcome and age groups of 20, 22 and 24 had negative outcome. Finally in institutional adaptation 19, 22, 23 and 24 had positive outcome and age groups of 18, 20, and 21 have negative outcome.

Conclusions : There are significant differences among student age groups of 18 – 24 on different forms of campus adaptations. In short, campus adaptations do vary across age groups influencing students experiences at university.

Key Words : campus, adaptation, academic, social, Physical – Psychological, Institutional

INTRODUCTION

Age is a prime feature of student life on all of the Higher Education campuses (Thornton et al., 2016). As per Census of India 1991, the student population in engineering and technology in the age group of 15 -19 were 18,258 and in the age groups of 20 -24 were 55,701. The census records states that the age cohort of 20 – 24 years saw a drastic rise of student population in engineering and technology with 5, 97,984 and 22, 62,700 in the years of 2001 and 2011 i.e. a 37.8 % rise in student population. The total number of undergraduate students students at IIT and NIT was 81,802 for the year 2013 – 14 as per reports of All India Survey on Higher Education. However the adaptability of these students at campus environments of institutions of higher learning, particularly in the field of engineering and technology remains untouched.

Age as a vital demographic item has a positive effect on college duration(Bers & Smith, 1991). Though there is a choice of entry into higher education by age ,

---

*   School of Management, National Institute of Technology Karnataka Surathkal, Mangalore – 575025, *E-mail: vijaylakshmins@nitk.edu.in*

**   Professor and Head, School of Management, National Institute of Technology Karnataka Surathkal, Mangalore – 575025, *E-mail: aloysiushs@gmail.com*; *ahs@nitk.ac.in*

students spanning an age range of 18 – 24 years "the youth age" (Sriranganathan *et al.,* 2012) (Çilan & Can, 2014) (P. Fousiya & Mohamedunni, 2014) and as the "undergraduate age" (Gasaymeh, Kreishan, & Al-Dhaimat, 2014) are usually found in higher education campuses. It is said that there is an "age for engineering;" a point at which pre-college students are sufficiently mature to understand and appreciate the activities that are common to engineering practice where initiative and activities besides curriculam indicate a minimum age at which the engineering profession can comprehensively be introduced (Mountain & Riddick, 2005) and so 18 years is an optimal age of entry to higher education campuses – the determinants of this optimal age of entry is Joint Entrance Examination (JEE) / All India Engineering Entrance Examination (AIEEE) along with the academic standing of higher secondary schooling being completed.

The study seeks to analyse the relationship among student age groups of 18 – 24 with the following research question and research objective :-

Research Questions: What makes campus adaptations by academic, social, physical - psychological and institutional attachment unique across student age cohort of 18 – 24?

Research Objectives: To examine existence of variance among campus adaptations by academic, social , physical psychological and institutional across student age cohort of 18 – 24.

1.   Campus Adaptations

1.1. Diversity

Age influences diversity at campus with a range of human differences. Age as an intersection of diversity can promote a holistic understanding of the realities and experiences of students to ensure that college campuses provide a healthy environment for education (Wei, Ku, & Liao, 2011). Thus age as a critieria for student adjustment at campus (Halamandaris & Power, 1999) is vital to understand the students perception of campus adaptations especially when it is said that there is a low low correlation between age and students adjustment (Gagne & Gagnier, 2004) at university.

1.2. Academic

Academic goal achievement changes with age (Cowan, 2011) as students of diverse age have motivational conflicts that develops only with age (Grund, Schmid, & Fries, 2015). Attendance in regular classroom teaching influences academic performance of students in engineering institutes in India (Singh & Rajoria, 2014) where, increase in age negatively influences grades and lowers students academic performance (Ercan, Bilen, & Bulut, 2013).The regular assessment of engineering courses, improves quality and its an initative drive to step up the academic

performance of students across age groups(Grimoni & Nakao, 2007) while 'context - based' teaching of faculty that parts away from relating it to daily life are regarded as 'not – adequate' influencing academic performance of students adversely. (Ültay & Usta, 2016). Thus Age influences performance of students academically.

1.3. Social

Tremendous developmental changes in the social, biological, and cognitive domains is characterised at adolescent age-period as its a time of critical transitions in education and learning of a students life (Oberle, Schonert-Reichl, & Thomson, 2010). It is in age of 18 – 24 that students establish autonomy from parents (Klima, Repetti, & Quarterly, 2014) where students become more selective about the relationships that they maintain (Lisa M. Swenson, Alicia Nordstrom, & Marnie Hiester, 2008) vindictive that Cross sectional age peers have higher social competence than same age peers (Cowan, 2011). Thus discrinmination at campus could also exsist on grounds of age (Thornton et al., 2016) though whemently age is a part of social hierarchy (Nakassis, 2013). influencing the socialisation process (Panizzon & Levins, 1997) responsible for bringing about the social change in society. (Francis, 1999).

1.4. Physical - Psychological

Age is an unchangeable attribute of an individual with a personal human face characteristic (Thornton *et al.,* 2016). On health grounds, college-age young adults are among those who consume the greatest amount of sugar-sweetened beverages, with half reporting daily consumption (Byrd-Bredbenner *et al.*, 2012). Thus age influences health and its priorities. As for safety, the perception of safety significantly varied across student age groups on campus (Patton & Gregory, 2014). Campuses are at-risk environments because they are heavily populated with individuals in the most at-risk age group for sexual and physical relationship violence. (Yazedjian, Toews, & Navarro, 2009).

On emotional front , Age is centre for association of interest (Lisa M. Swenson *et al.,* 2008) Age influences how people treat . Appropriate behaviours are associated with age groups where same age group have similar interests impacting individual behaviours (Panizzon & Levins, 1997). Age influences levels of both aggression and depression (Laible, Carlo, & Raffaelli, 2000) among college students where life experiences that varied by age; impacted education. (Ardelt, 2010).

1.5. Instituional

Age is a predictor of persistence at an institution (Cabrera, Nora, & Castaeda, 1992). An age of early entry indicates an improvement in institutional quality (Bommier & Lambert, 2000) where significant differences in institution readiness among students of same age cohort persisted (Gagne & Gagnier, 2004).

The study perpetuates the following research hypothesis:

H_1: There is a significant difference among student age cohort of 18 – 24 in academic adaptation.

H_2: There is a significant difference among student age cohort of 18 – 24 in social adaptation.

H_3: There is a significant difference among student age cohort of 18 – 24 in Physical – Psychological adaptation.

H_4: There is a significant difference among student age cohort of 18 – 24 in institutional adaptation.

2. METHODS

2.1. Participant

The reference population were undergraduate 4 year B.tech students enrolled on a regular study mode at IIT's and NIT's. The age considered in the study is based on actual age as stated by the students. A total of 1420 students participated with 1385 of valid responses for an overall 97.5 percent participation rate after deducting the questionnaire that contained empty answers. Data was collected for 20 weeks across institutions of IIT's and NIT's. Of the 1385 undergraduate respondents, 14.80 % students were aged 18, 18.62% students were aged 19, 27.43% students were aged 20, 24.42% students were aged 21, 10.83% students were aged 22 , 1.95% students were aged 23 and 1.95% students were aged 24.

2.2. Sampling

The sample frame under study was derived from Report of All India Survey on Higher Education (AISHE) 2011 – 2014 leading to probability sampling technique followed by cluster sampling in identification of institutes of IIT's and NIT's, stratified sampling in sample choice of undergraduate students population and simple random in collecting data from the chosen student population stated above.

2.3. Instrument and Procedure

The survey was conducted using a structured online questionnaire with reference to student's campus and non campus email accounts. At all times, the students were informed of the anonymous, confidential, and voluntary nature of their participation and any doubts that arose were clarified.

2.4. Measures

All the 21 items in the questionnaire were measured with rating on a five - point likert scale ranging from "1 = strongly disagree" to "5 = strongly Agree"

2.5. Reliability and Validity

Reliability of all constructs was individually measured using Cronbach's Alpha to check internal consistencies of items in measuring the constructs. Alpha value greater than 0.6 indicates a good reliability of the instrument. Confirmatory Factor Analysis (CFA) was used to verify construct validity of the scale. Kaiser- Meyer-Olkin Measure of Sampling Adequacy (KMO) value greater that 0.5 and factor loading values greater than 0.5 indicates that the measurement scale is adequate and indicates good construct validity. As shown in Table 1, reliability and sampling adequacy for all constructs are good enough. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, with a value of 0.908, and the statistically significant Bartlett's test of sphericity, $X^2(210) = 10009.330$; $p < 0.01$, confirmed the benefits of conducting an Exploratory Factor Analysis (EFA).

TABLE 1: DETAILS OF RELIABILITY AND VALIDITY

Variable	Number of items	Items	Mean	SD	Factor loading	Cronbach alpha	KMO
Academic Adaptation	6	academic purpose and goal	3.81	1.106	.579	.760	.759
		academic work	3.24	1.195	.737		
		attendance	4.00	1.121	.678		
		Quality of courses	3.02	1.172	.561		
		Intellectual calibre of faculty	3.11	1.189	.610		
		Overall academic performance	3.13	1.078	.626		
Social Adaptation	5	Socially well with fellow classmates	3.86	1.034	.602	.650	.711
		Socially well with students of opposite sex	3.09	1.255	.586		
		Faculty are mentors	2.38	1.298	.728		
		non teaching staff	3.19	1.178	.505		
		Overall social life at collge	3.48	1.091	.619		
Physical – Psychological Adaptation	5	Physical health	3.66	1.071	.624	.777	.767
		Mental health	3.56	1.106	.717		
		Sharing problems	3.83	1.170	.719		
		Confident to face future challenges	3.87	1.052	.683		
		Safety	4.19	0.979	.546		
Instituional Adaptation	5	Institutional facilities	3.36	1.294	.775	.791	.772
		Hostel facilties	3.17	1.261	.741		
		Course completion	4.08	1.049	.512		
		Choice of institute	3.67	1.173	.638		
		fit in well to campus environment	3.72	1.051	.500		

3. DATA ANALYSIS

Manova: - MANOVA is a generalized form of analysis of variance where there are two or more dependent variables. MANOVA tests the statistical significance

of the variance – covariance differences between groups compared different dimensions of campus adaptations among student age group of 18 – 24 years.

TABLE 2: DISTRIBUTION OF DIFFERENCE IN DIMENSIONS OF CAMPUS ADAPTATIONS

Age Groups (n =1385)	*Campus Adaptation Scale*							
	Academic		*Social*		*Physical - Psychological*		*Institutional*	
	Mean	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*
18 (n = 205)	3.57	0.753	3.25	0.707	3.79	0.821	3.78	0.804
19 (n = 258)	3.45	0.774	3.11	0.743	3.78	0.781	3.62	0.874
20 (n = 380)	3.31	0.768	3.12	0.783	3.76	0.838	3.48	0.889
21 (n = 338)	3.24	0.766	3.23	0.769	3.90	0.753	3.58	0.852
22 (n = 150)	3.35	0.716	3.27	0.752	3.87	0.682	3.55	0.848
23 (n = 27)	3.83	0.653	3.49	0.713	4.01	0.638	4.05	0.658
24 (n = 27)	3.99	0.763	3.63	0.653	3.85	0.683	3.82	0.934
Total (n =1385)	3.38	0.772	3.20	0.759	3.82	0.783	3.60	0.864

3.1. Results and Discussions

Using Pillai's Trace, there was a significant effect of age on students campus adaptations of Academic, Social, Physical – Psychological and Institutional (V = 0.080, $F_{(24,5512)}$ = 4.706 and p = 0.000) *($p < 0.05$).

Using Wilks Lambda, there was a significant effect of age on students campus adaptations of Academic, Social, Physical – Psychological and Institutional (Λ = 0.921, $F_{(24,4798)}$ = 4.762 and p = 0.000) *($p < 0.05$).

Using Hotelling's trace statistic, there was a significant effect of age on students campus adaptations of Academic, Social, Physical – Psychological and Institutional (T = 0.084, $F_{(24,5494)}$ = 4.807 and p = 0.000) *($p < 0.05$).

Using Roy's largest root, there was a significant effect of age on students campus adaptations of Academic, Social, Physical – Psychological and Institutional (T = 0.084, $F_{(6,1378)}$ = 13.738 and p = 0.000) *($p < 0.05$).

However separate univariate analysis on the outcome revealed insignificant effect of students age on Physical – Psychological awith $F_{(6,1378)}$ = 1.387, p = 0.216 *($p > 0.05$).

The Manova is followed by discriminant analysis, to identify how the dependent variables discriminate the groups, which revealed four discriminant functions. The first discriminant function explained 71.2% of the variance, canonical R^2 = 0.60, the second discriminant function explained 18.6% of the variance, canonical R^2 = 0.016, the third discriminant function explained 9.0% of the variance, canonical R^2 = 0.008 and the fourth discriminant function explained 1.2% of the variance, canonical R^2 = 0.001.

Discriminant function analysis identifies the variates or combination of dependent variables that significantly discriminate the groups. In combination the first and the second discriminant functions significantly differentiated the student groups of age $18-24$, with the first function $\Lambda = 0.921$, x^2 (24) 113.204, p = 0.000 ($p < 0.05$) and the second function $\Lambda = 0.976$, x^2 (15) 33.118, p = 0.000 ($p < 0.05$). However the combination of the third and the fourth discriminant functions did not significantly differentiate among the student groups of age $18-24$, with the third function $\Lambda = 0.991$, x^2 (8) 11.794, p = 0.161 ($p > 0.05$) and the fourth function $\Lambda = 0.999$, x^2 (3) 1.409, p = 0.703 ($p > 0.05$). Hence the significant variates are academic and social adaptation.

The standardised Canonical discriminant function coefficient indentifies how dependent variables contribute to the variate. The Canonical discriminant function coefficient 0.983 indicating that academic adaptation is an important a variate where canonical discriminant function coefficient -0.496 and -0.330 of adaptation and social adaptation are positively contributing to the variate than the canonical discriminant function coefficient 0.490 of institutional adaptation which negatively contributes to the variate. The Canonical discriminant function coefficient 1.035 indicates that social adaptation is an important variate. The Canonical discriminant function coefficient - 0.532, - 0.478, and - 0.017 of institutional, Physical – Psychological and academic adaptation positively contribute to the variate.

3.2. Findings

The age group 18 has positive outcomes on academic (0.329), social (0.017), physical psychological adaptations (0.008) and a negative outcome in institutional adaptation (-0.051). The age group 19 has positive outcomes in academic (0.127), physical - psychological (0.034) and institutional adaptation (0.041) and negative outcome in social adaptation (-0.149). The age group 20 has negative outcomes in academic adaptation (-0.080), social adaptation (-0.098), physical - psychological (-0.072), institutional adaptation(-0.014) and no positive outcomes among campus adaptations. The age group of 21 had positive outcomes on social (0.112) physical - psychological adaptations (0.056) and negative outcomes in academic (-0.271) and institutional adaptations (-3.65). The age group of 22 had positive outcomes in social (0.110) and institutional adaptations (0.015) and negative outcomes on academic (-0.107) and physical - psychological adaptations (-0.090). The age groups of 23 had a positive outcome on all campus adaptations with academic (0.567), social (0.294), physical - psychological (0.166) and institutional (0.108). The age groups of 24 had positive outcomes on academic (0.827), social (0.371) and institutional adaptations (0.011) while a negative outcome on physical - psychological adaptation (-0.362). In brief, the alternate hypothesis on academic adaptation (H_1), social adaptation (H_2), physical - psychological adaptation (H_3) and institutional adaptation (H_4) are accepted at p < 0.05.

3.3. Conclusions

The adaptability of students at different institutions remain diverse. However this adaptability is diversified by age groups as the level of adaptability of students enhances maturely over a period of time on forefronts of academic, social, physical – psychological and Institutional aspects of campus environments.

3.4. Implication of the Study

This study is a debut for understanding on the students' nature of adaptations at campus environments of higher technical educational institutions. Results of the study indicated that the perceptions of campus adaptations vary across age groups. Certainly adequate understanding of campus environments to which student group between the age of 18 – 24 are put through, needs an examination. This study was subject to some limitations as the sample comprised of 4 year undergraduate B.Tech students alone, however future studies could develop the study to the next level of graduate and research student campus adaptabilities that diversifies to a greater extent by age factor alone.

References

Ardelt, M. (2010). Are Older Adults Wiser Than College Students? A Comparison of Two Age Cohorts. *Journal of Adult Development*, *17*(4), 193–207. doi:10.1007/s10804-009-9088-5.

Bers, T. H., & Smith, K. E. (1991). Persistence of Community College Students: The Influence of Student Intent and Academic and Social Integration. *Research in Higher Education*, *32*(5), 539–556.

Bommier, A., & Lambert, S. (2000). Education Demand and Age at School Enrollment in Tanzania. *The Journal of Human Resources*, *35*(1), 177–203. doi:10.2307/146360.

Byrd-Bredbenner, C., Johnson, M., Quick, V. M., Walsh, J., Greene, G. W., Hoerr, S.,Horacek, T. M. (2012). Sweet and salty. An assessment of the snacks and beverages sold in vending machines on US post-secondary institution campuses. *Appetite*, *58*(3), 1143–1151. doi:10.1016/j.appet.2012.02.055.

Cabrera, A. F., Nora, A., & Castaeda, M. B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education*, *33*(5), 571–593. doi:10.1007/ BF00973759.

Çilan, Ç. A., & Can, M. (2014). Measuring Factors Effecting MBA Students' Academic Performance by Using Categorical Regression Analysis: A Case Study of Institution of Business Economics, Istanbul University. *Procedia - Social and Behavioral Sciences*, *122*, 405–409. doi:10.1016/j.sbspro.2014.01.1362.

Cowan, B. W. (2011). Forward-thinking teens: The effects of college costs on adolescent risky behavior. *Economics of Education Review*, *30*(5), 813–825. doi:10.1016/ j.econedurev.2011.04.006

Ercan, O., Bilen, K., & Bulut, A. (2013). The Effect of Web-based Instruction with Educational Animation Content at Sensory Organs Subject on Students' Academic Achievement and Attitudes. *World Conference on Educational Sciences (WCES 2013)*, *116*, 2430–2436. doi:10.1016/j.sbspro.2014.01.587

Francis, B. (1999). "You can never get too much education": the discourses used by secondary school students in their discussion of post-compulsory. *Research in Post-Compulsory Education*, *4*(3), 305–319. doi:10.1080/13596749900200061.

Gagne, F., & Gagnier, N. (2004). The Socio-Affective and Academic Impact of Early Entrance to school. *Roeper Review*, *26*(3), 128–138. doi:10.1080/02783190409554258.

Gasaymeh, A.-M. M., Kreishan, L. J., & Al-Dhaimat, Y. A. (2014). The Effects of Age, Gender, and Major on Measures of Jordanian Students' Attitudes towards Academic Group Learning in Computer Training Courses. *Journal of Education and Practice*, *5*(15), 173–180.

Grimoni, J. A. B., & Nakao, O. S. (2007). Designing Indicators to Measure the Quality of Engineering Courses/ : The Case of Escola Politécnica da Universidade de São Paulo. In *International Conference on Engineering Education - ICEE* (pp. 1 − 8).

Grund, A., Schmid, S., & Fries, S. (2015). Studying against your will: Motivational interference in action. *Contemporary Educational Psychology*, *41*, 209–217. doi:10.1016/j.cedpsych.2015.03.003.

Halamandaris, K. F., & Power, K. G. (1999). Individual differences, social support and coping with the examination stress: A study of the psychosocial and academic adjustment of first year home students. *Personality and Individual Differences*, *26*(4), 665–685. doi:10.1016/S0191-8869(98)00172-X

Klima, T., Repetti, R. L., & Quarterly, M. (2014). Children's Peer Relations and Their Psychological Adjustment/ : Differences between Close Friendships and the Larger Peer Group Children's Peer Relations and Their Psychological Adjustment Differences between Close Friendships. *Merrill-Palmer Quarterly*, *54*(2), 151–178. doi:10.1353/mpq.2008.0016.

Laible, D. J., Carlo, G., & Raffaelli, M. (2000). The differential relations of parent and peer attachment to adolescent adjustment. *Journal of Youth and Adolescence*, *29*(1), 45–59. doi:10.1023/A

Lisa M. Swenson, Alicia Nordstrom, & Marnie Hiester. (2008). The Role of Peer Relationships in Adjustment to College. *Journal of College Student Development*, *49*(6), 551–567. doi:10.1353/csd.0.0038.

Mountain, J. R., & Riddick, a. D. (2005). Determining the Age for Engineering. *Proceedings Frontiers in Education 35th Annual Conference*, S1F−1−S1F−6. doi:10.1109/FIE.2005.1612182.

Nakassis, C. V. (2013). Youth masculinity, "style" and the peer group in Tamil Nadu, India. *Contributions to Indian Sociology*, *47*(2), 245–269. doi:10.1177/0069966713482982.

Oberle, E., Schonert-Reichl, K. a., & Thomson, K. C. (2010). Understanding the Link Between Social and Emotional Well-Being and Peer Relations in Early Adolescence: Gender-Specific Predictors of Peer Acceptance. *Journal of Youth and Adolescence*, *39*(11), 1330–1342. doi:10.1007/s10964-009-9486-9.

P. Fousiya, & Mohamedunni, M. M. (2014). Scholars Journal of Arts , Humanities and Social Sciences. *Scholars Journal of Arts , Humanities and Social Sciences*, *2*(2(A)), 190 −196.

Panizzon, D., & Levins, L. (1997). An analysis of the role of peers in supporting female students' choices in science subjects. *Research in Science Education*, *27*(2), 251–270. doi:10.1007/BF02461320.

Patton, R. C., & Gregory, D. E. (2014). Perceptions of Safety by On-Campus Location, Rurality, and Type of Security/Police Force: The Case of the Community College. *Journal of College Student Development*, *55*(5), 451–460. doi:10.1353/csd.2014.0049.

Singh, S. K., & Rajoria, R. P. (2014). Study of Loss of Attendance in Engýneerýng Institutýons due to Holidays and Conferences. *International Journal of Educational Research and Technology*, *5*(March), 87–91.

Sriranganathan, G., Jaworsky, D., Larkin, J., Flicker, S., Campbell, L., Flynn, S., … Erlich, L. (2012). Peer sexual health education: Interventions for effective programme evaluation. *Health Education Journal*, *71*(1), 62–71. doi:10.1177/0017896910386266.

Thornton, A. M., Bricheno, P., Iyer, P., Reid, I., Wankhede, G., & Green, R. (2016). Title/ : Getting diverse students and staff to talk about integration on campus , and what they say when they do/ : A UK-India collaborative case study, (February).

Ültay, N., & Usta, N. D. (2016). Investigating Prospective Teachers' Ability To Write Context-Based Problems *Journal of Theory and Practise in Education*, *12*(2), 447 – 463.

Wei, M., Ku, T.-Y., & Liao, K. Y.-H. (2011). Minority stress and college persistence attitudes among African American, Asian American, and Latino students: perception of university environment as a mediator. *Cultural Diversity & Ethnic Minority Psychology*, *17*(2), 195–203. doi:10.1037/a0023359.

Yazedjian, A., Toews, M. L., & Navarro, A. (2009). Exploring parental factors, adjustment, and academic achievement among White and Hispanic college students. *Journal of College Student Development*, *50*(4), 458–467. doi:10.1353/csd.0.0080.