Comparing Deemed and State Universities on Perception of Educational Offerings Using Factorial MANOVA

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Abstract

Purpose : The study intended to offer evidence for three propositions: whether deemed and state universities differ in their educational offerings ; whether the worth of educational offerings depends on the appropriateness of fee perception by students ; and whether the relationship between the "perception of fee appropriateness" and "education offerings" is dependent on the type of university.

Design : Experimental design was adopted to address the research concern - "appropriateness of fee charged will stimulate value proposition in management education." We used factorial MANOVA to explore three effects (Main Effect 1: it is hypothesized that deemed and state universities differ in their educational offerings; Main Effect 2: Worth of educational offerings depends on the appropriateness of fee perception by students ; Interaction Effect: Relationship between "perception of fee appropriateness" and "education offerings" is dependent on the type of university [interaction effect is not zero]).

Findings : The results of factorial MANOVA revealed a major finding that if students feel they are charged appropriately, they will rate educational offerings, academic excellence, infrastructure, career aspirations, and skills acquired, as superior.

Research Limitations : The study did not include management students of private universities and autonomous colleges. The study was cross-sectional in time dimension and not longitudinal, and hence, a causal relationship could not be established.

Originality/Value : It is the first study to use factorial MANOVA to test two main effects and one interaction effect with respect to educational offerings of deemed and state universities.

Keywords : **academic excellence, career aspirations, factorial MANOVA, fee perception, infrastructure, quality, skills acquired**

JEL Classification : C1, I2, M1

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Management education has emerged as a key economic factor in India, mainly in the city Pune. Management education in Pune city may be recognized as a key reason responsible for the growth of the city and its economy. Managing an institute offering the MBA programme efficiently in a constantly changing and competitive scenario is demanding and it is increasingly tough to meet the expectations of students as stakeholders. Kumar and Shekhar (2017) emphasized on reputation and benefits of knowledge involvement practices in higher education. Growth and quality are often felt to be contradicting each other. Palety (2009) raised the question of delivery of service quality in the education sector. There exists a gap between expectations and perception of management education. Management institutions have undergone major changes throughout the world. Due to the intensification of globalization, competition, and professionalism in the corporate world, management education occupies a major role in students' career and lifelong learning aspirations. It is often stated by scholars that management education should be practical, experience based, interactive, and of high quality (Kaul, 2011). An effective way of measuring and understanding the MBA students' perceptions for understanding how they perceive quality of management education received as against the fee paid is essential if institutes are to grow and sustain in the future. The literature until now has largely highlighted the factors related to the choice of management education and institutions. However, none have been able to provide a complete structural view related to the perception of fee appropriateness with reference to quality of management education. Seyfried and Pohlenz (2018) offered a mixed-method perspective on the investigation of determinants of effectiveness in quality assurance in higher education institutions.

Literature Review

Systematic literature review was adopted to critically examine the originality of the four research questions. The literature review comprises of a comprehensive overview of past studies. These papers have been combined, contrasted, and compared for identifying study constructs and research gap and demonstrating the uniqueness and originality of the study.

(1) Fee Perception : Stakeholders play a vital role in the survival and growth of institutions in a changing and dynamic environment. It is necessary to correlate cost with value exchange. Afgan and Carvalho (2010) defined the need for a full understanding of the distribution of knowledge, access to information, and the capability to transfer information into knowledge. The understanding of knowledge is the central challenge when defining a knowledge society.

(2) Academic Excellence : An acceptable academic standard is necessary for management education to focus on the above-stated features in order to survive and grow. Faculty quality affects the quality of performance and efficiency of MBA programmes. Porter and Córdoba (2009) found that updated and practical tools should be used by educators in management education. There should be a balance between learning and research as well as industry exposure (Rubin & Dierdorff, 2009). Kajaste, Prades, and Scheuthle (2015) examined the expected impacts of different quality elements on higher education institutions and assessed the impact of procedure. Leiber (2018) mentioned that the significance of higher education is vital than ever in knowledge societies, therefore, quality of higher education and its effectiveness need to be corrected. However, there is still a lack of systematic evaluation of these factors.

(3) Career Aspirations : Curriculum offered and career aspirations are highly correlated (Sullivan & Baruch, 2009). According to Kulkarni (2010), management education is now contributing to create a commercial environment and that is the reason why MBA institutes survive on placements offered ; often being perceived to be placement agencies rather than knowledge providers. Employment prospects among management graduates are

the reason for the major proliferation of the management schools across India. The role of entrepreneurship education in management schools becomes extremely important as it will foster job creation, encourage risk taking and innovation, and improve the global competitiveness of Indian enterprises. MBA degrees are a combination of competency, income, and career success. Value addition processes need to be revised and placement of students being an unavoidable consequence has become superior (Ladd, Jelezko, Laflamme, Nakamura, Monroe, & O'Brien, 2010 ; Rao & Hans, 2011). Worsening in the quality of management education leads to a slowly developing job market that contemplates the MBA degree simply as an admittance qualification.

(4) Institutional Features : The quality divide has been increasing between management institutions and regulatory bodies, and it has become essential to address the same. Accreditation of MBA programmes is important and affects all the factors of quality of management education. The current status of management education in India is focussed toward achievement of quality standards and global competition. Reputation of an MBA college and branding are the important factors considered by students while choosing an MBA programme.

(5) Skills Acquired : Acquiring useful skills through an MBA programme is a very important experience of MBA graduates as seen in the review of literature and these skills and experiences are transferable for better industry outcomes. Northouse (2018) focused on leadership ability as being a very important trait of a successful manager. Aggarwal (2017) discussed the role of e-learning in the higher educational environment in this digital age, along with comparing the economic costs associated with traditional face-to-face and e-learning methods. The most important skill seems to be leadership, which can bring drastic changes in outcomes.

(6) Infrastructure : MBA/PGDM education now appears to be a victim of its own success. Deterioration in the quality of management education is making it a basic qualification (Bohra, 2013).

Physical infrastructure associated with higher education institutes usually includes an auditorium ; conference hall ; seminar hall ; and size/number of adequate classrooms ; faculty members' private cubicals with laptop/desktop facility ; residential facility ; quality mess/cafeteria at reasonable rates ; furniture and fixtures ; digital library ; and library with sufficient textbooks, references, magazines, and journals with access to databases and training on databases. National quality management systems attempt to identify both kinds of differences in quality and standards across their higher education systems. Infrastructure is physical, IT related, and modern facilities required for quality learning.

IT Infrastructure includes wi-fi campuses with high-speed Internet connectivity and computer labs with the required number of PCs. Equipped classrooms with smart classroom features such as LCD projectors, audio–visual, and digital boards are now a minimum. Many institutes in India, however, still operate with negligible amenities in remote locations of the country. Khatri and Raina (2019) discussed about awareness training by faculty about government interventions with regard to the policies introduced for enhancing the quality of education.

Objectives of the Study

The general intentions of the study are fourfold : (a) to study whether deemed and state universities differ in educational offerings ; (b) to study whether perceived quality of management education is dependent on the fee charged ; (c) to study whether deemed and state universities differ in skills acquired by their management students ; and (d) to study whether deemed and state universities differ in appropriateness of fee charged.

Hypotheses

- **H01 :** Deemed and state universities do not differ in their educational offerings.
- **Ha1 :** Deemed and state universities differ in their educational offerings.
- **H02 :** Worth of educational offerings is independent of the appropriateness of fee perception by students.
- **Ha2 :** Worth of educational offerings depends on the appropriateness of fee perception by students.

A deductive approach is used to accomplish the above four objectives and validate the hypotheses. The purpose and value of management education is often discussed and analyzed, but the propagation of MBA colleges provoked a serious question on their quality in Pune city. Hence, we conducted a qualitative research with a group of MBA students from deemed and state universities of Pune city. A concern was shown about fee hikes and quality of management education. The discussion focussed on the quality of management education and the students were concerned that the quality was not in proportion to the fee paid. In the light of this discussion, the study is conducted to confirm whether quality is the result of fee and what is the value exchange in return of cost paid for the MBA programme.

Research Design

The present research work is based on both primary as well as secondary data and information. In order to get the primary data from the root source, structured questionnaires were prepared for the MBA students. The following research frameworks were adopted for completion of the study .

The study time duration spanned between October 2018 – August 2019. A descriptive approach is used to validate the research hypotheses and answer the four research questions :

(i) Whether deemed and state universities differ in educational offerings.

(ii) Whether perceived quality of management education is dependent on fee charged.

(iii) Whether deemed and state universities differ in skills acquired by management students.

(iv) Whether deemed and state universities differ in appropriateness of fee charged.

The study is quantitative in nature. Quantification of data involved, data cleaning, and data processing were done using factorial MANOVA. Quantitative data were collected from 392 MBA students from deemed and state university colleges of Pune city. To measure MBA students' perceptions for quality of management education, a detailed questionnaire was administered.

Secondary data were derived from the following databases: ProQuest, Science Direct, EBSCO, Scopus, Emerald, and Springer. It included extensive literature review, survey-based research from EBSCO, Emerald, Scopus, JSTOR, Thomson Reuters, and Google Scholar. Primary information were collected using personal-administered survey. Respondents were approached with a structured questionnaire and were asked to provide information to a set of structured questions through self-reporting. The 392 MBA students from deemed and state universities were approached in person and were interviewed using a structured questionnaire. The student respondents were asked to rate each statement on a Likert scale from 1 to 5 on all latent constructs (1 being *strongly disagree* and 5 being *strongly agree*).

Time dimension in cross-sectional data were collected at single point of time. We adopted the mixed sampling method in this study, which included stratified sampling and cluster sampling method.

(1) Sample Size Determination : Sample size is determined using sample size determination by mean method. The mean method was used because variables in the study are measured using a 5-point measurement scale.

$$N = \frac{z^2 * s^2}{e^2}$$

where, "*z*" is the standard score associated with confidence level (95% in the current case). Hence, standard scores equal 1.96 (borrowed from normal table). "*s*" is the variability in the data set, computed as a ratio of range /6. Range is equal to 5 – 1 = 4 (the difference between minimum and maximum value in the 5-point scale). Note that 6 refers to ±3 standard deviation values on the *X*-axis of the standard normal curve, which takes in all the datasets in the study.

Hence, $s = 4/6 = 0.66$, e is the tolerable error, which equals 7% (in the current study). Sample size $n = \frac{1.96^2 * 0.66^2}{0.07^2}$ = 341. In order to deal with nonresponse, approximately 15% of the sample size was taken as a buffer, therefore, 341 × 15% = 52, 340 + 52 = 392. Hence, the sample size was freezed at 392.

(2) Statistical Analysis : Data processing adopted for this research follows a three - step approach : Data sanitization, assessing reliability, and validity & design for the research. Data sanitization is the cleaning of data to ensure that the raw data are free from errors and mistakes, missing values, and violation of important assumptions and outliers. Data entry in the system revealed that 10% of the data was missing. Expectation maximization technique in IBM SPSS 24 was used to replace the missing values. Unusual scored were corrected through frequency distribution tables. As MANOVA is a parametric test, assumption of normality is important. Normality for data used in the study is examined using QQ plot (quantile and quantile plot). A QQ plot has a diagonal line indicating normality. If data for a particular variable falls on the line or is close to the line, normality is supported. All variables had data close to the diagonal line, indicating normality. Skewness and kurtosis values were also computed for examining normality. According to George and Mallery (2010), variables with skewness and kurtosis value between ±1 support normality. All variables used for factorial MANOVA had skewness and kurtosis values between the threshold range.

(i) Assessing Reliability and Validity : Reliability is the ability of the scale to produce consistent results. It is the extent to which a scale can produce trustworthy results. As variables in the study are both categorical and continuous and as the continuous variables are single item, scaled test - retest method is used to confirm reliability. Test - retest is a simple and straightforward method of confirming reliability by collecting data for variables under study on two different occasions from the same set of respondents. Consistency in the responses is measured using Spearmen's Rho for continuous variables and Phi coefficient for categorical variables. All variables have a Rho value above .9 and Phi coefficient above .5, which is a necessary condition for reliability. Validity is the extent to which a scale can produce trustworthy results. It is the ability of the instrument to correctly measure the underline variables. Content validity ratio suggested by Lawshe (1975) was used to confirm validity. According to Lawshe, content validity ratio of .74 and above for eight variables and seven experts (two-tailed test, α =.05) is an indication of validity. All variables had content validity ratio (CRV) above .74.

(ii) Experimental Design : The study has employed factorial MANOVA to answer three important research questions: (a) whether deemed and state universities in Pune differ in educational offerings. The study includes four dependent variables (educational offerings : academic excellence, infrastructure, career aspirations, and skills acquired). (b) Whether "educational offerings" is a result of fee perception. (c) Whether relationship between "perception of fee appropriateness" and "educational offerings" is moderated by the type of university. Factorial MANOVA is an advanced statistical tool used to determine the impact of two or more categorical

explanatory variables on several dependent variables. It runs in two steps: (a) the impact of explanatory variables is examined for aggregate - dependent variables using multivariate effects ; (b) later, the impact of explanatory variables on each dependent variables is examined separately using univariate test and Bonferroni corrected alpha to avoid alpha inflation. Analysis is performed using IBM's Statistical Package for Social Sciences (SPSS) version 24. Cut off probability (level of significance) is chosen as 5%.

(iii) Assumptions : Three important assumptions have be examined for statistical viability of results: (a) assumption of normality is examined using the criteria suggested by George and Mallery (2010) ; (b) assumption of correlation between the dependent variables under study is examined using Bartlett's test of sphericity; and (c) assumption of homogeneity of variance covariance matrices is examined using Box's *M*-test.

(iv) Effects : The analysis explores three effects: two main effects and one interaction effect. Main Effect 1: It is hypothesized that deemed and state universities differ in their educational offerings. Main Effect 2: Worth of educational offerings depends on appropriateness of fee perception by students. Interaction Effect: Relationship between "perception of fee appropriateness" and "Education offerings" is dependent on type of university (interaction effect is not zero).

Analysis and Results

According to George and Mallery (2010), normality is supported if variables have skewness and kurtosis values between ±1. It is interesting to note that all outcome variables (academic excellence, infrastructure, career aspirations, and skills acquired) have skewness values with the threshold range of ±1 across the grouping variables (kind of university, appropriateness of fee perception, and interaction). The Bartlett's test of sphericity is significant [χ^2 (9), $p < .001$], indicating that the dependent variables are related to proceed with the analysis. The assumption of homogeneity of variance – covariance matrices is not supported [Box's M = 41.028, F (30, 32810.67) = 1.318, p = .114), indicating that the observed covariance matrices of the dependent variable are equal across the independent variable groups. Hence, Pillai's trace is employed to assess the multivariate effects.

As shown in Table 1, Pillai's trace test is significant for the two main effects resulting in the inference that deemed and state universities differ in perception of educational offerings ($p < .05$). Hence, the hypothesis Ha1 is proved. Worth of educational offerings depends on appropriateness of fee perception ($p < .01$). Hence, the hypothesis, Ha2 is proved. Pillai's trace is insignificant for interaction effect ($p > .05$) ; hence, it is inferred that interaction effect does not exist. In other words, the relationship between kind of university and educational offerings is not moderated by appropriateness of fee perception of students.

Table 1. Multivariate Test

Effect	Pillai's Trace Value	*F*-value	*df*	Error *df*	*p*-value
Kind of university	.033	2.841*	4	335	.024
Appropriateness of fee perception	.046	4.032**	4	335	.003
Interaction effect	.013	1.131ns	4	335	.342

Note. ns - not significant.

* and ** indicate statistical significance at 5% and 1% levels, respectively.

Assessing the Univariate Effects

As Pillai's trace is significant, univariate ANOVA is conducted on each dependent variable in the educational

Table 2. Main Effect 1: Kind of University

Dependent Variable	Kind of University	Mean	*SD*	*F*-value	*Df*	Error *df*	*p*-value
Academic Excellence	Deemed	3.493	.064	0.705^{ns}	1	338	.402
	State	3.399	.092				
Infrastructure	Deemed	3.717	.055	0.961^{ns}	1	338	.328
	State	3.623	.078				
Skills Acquired	Deemed	3.678	.064	1.633^{ns}	1	338	.202
	State	3.328	.092				
Career Aspirations	Deemed	3.560	.060	9.737**	1	338	.002
	State	3.426	.086				

Note. ns - not significant. ** indicates statistical significance at the 1% level.

offerings : academic excellence, infrastructure, career aspirations, and skills acquired separately to determine the locus of statistically significant multivariate effect. Impact of the categorical variables (kind of university and appropriateness of fee perception) is examined on each dependent variable separately with Bonferroni corrected alpha to avoid alpha inflation (.05/4 = .0125).

Table 2 shows that the mean values for deemed universities (3.493) and state universities (3.399) for the dependent variable: academic excellence do not differ as the ANOVA test is insignificant [F (1, 338) = 0.705, $p > .0125$] ; hence, it is inferred that deemed universities and state universities are perceived equal with reference to academic excellence. It also shows that the mean values for deemed universities (3.717) and state universities (3.623) for the dependent variable : infrastructure do not differ as the ANOVA test is insignificant [F (1, 338) = 0.961, $p > .0125$] ; hence it is inferred that deemed universities and state universities are perceived equal with reference to infrastructure. Further, it shows that the mean values for deemed universities (3.678) and state universities (3.328) for the dependent variable : skills acquired do not differ as the ANOVA test is insignificant [F (1, 338) = 1.633, $p > .0125$] ; hence, it is inferred that deemed universities and state universities are perceived equal with reference to skills acquired. However, the mean values of deemed and state universities for the dependent variable : career aspirations differ with deemed universities having a higher mean value (3.560) and significant ANOVA F-test (1, 338) = 9.737, $p < .0125$; hence, it is inferred that deemed universities (M = 3.560) are perceived to be superior in career aspirations as compared to state universities (M = 3.426). Therefore, it is concluded that students felt that deemed universities are better than state universities in Pune with respect to career aspirations, although they are similar in academic excellence, infrastructure, and skills acquired.

Table 3 shows that the mean values for the two categories (over charged and appropriate) of the second

Table 3. Main Effect 2: Appropriateness of Fee Perception

Dependent Variable	Appropriateness of Fee Perception	Mean	*SD*	*F*-value	*Df*	Error *df*	*p*-value
Academic Excellence	Over charged	3.249	.099	12.287	1	338	.001
	Appropriate	3.643	.053				
Infrastructure	Over charged	3.554	.084	5.900	1	338	.011
	Appropriate	3.786	.045				
Skills Acquired	Over charged	3.313	.099	9.018	1	338	.003
	Appropriate	3.694	.052				
Career Aspirations	Over charged	3.336	.092	11.543	1	338	.001
	Appropriate	3.650	.049				

independent variable (perception of fee appropriateness) for the dependent variable: Academic excellence differ, with over charging having a lower mean value (3.249) and significant ANOVA F-test (1, 338) = 12.287, $p < .0125$. Hence, it is inferred that over charging of fee will result in poor rating of academic excellence compared to appropriate fee charging ($M = 3.643$). It is also inferred from the table that the mean values of perception of fee appropriateness for the dependent variable : Infrastructure differ, with over charging having a lower mean value (3.554) and significant ANOVA F-test (1, 338) = 5.900, $p < .0125$. Hence, it is inferred that over charging of fee will result in poor rating of infrastructure compared to appropriate fee charging ($M = 3.786$). Further, it also shows that the mean values of perception of fee appropriateness for the dependent variable : skills acquired differ, with over charging having a lower mean value (3.313) and significant ANOVA F-test (1, 338) = 9.018, $p < .0125$. Hence, it is inferred that over charging of fee will result in poor rating of skills acquired as compared to appropriate fee charging ($M = 3.694$). Finally, it shows that the mean values of perception of fee appropriateness for the dependent variable: career aspirations differ, with over charging having a lower mean value (3.336) and significant ANOVA F-test (1, 338) = 11.543, $p <. 0125$. Hence, it is inferred that over charging of fee will result in poor rating of career aspirations as compared to appropriate fee charging ($M = 3.426$). Hence, it is concluded that if students feel they are charged appropriately, they will rate educational offerings such as academic excellence, infrastructure, career aspirations, and skills acquired to be superior.

Figures 1- 4 show the absence of the interaction effect.

Figure 1 shows parallel lines, indicating an absence of moderation effect of university type for relationship between appropriateness of fee perception and academic excellence. Hence, influence of fee appropriateness on academic excellence is visible for both students studying in deemed and state universities. Figure 2 also shows no

Figure 1. Moderation Effect of "University Type" for Academic Excellence

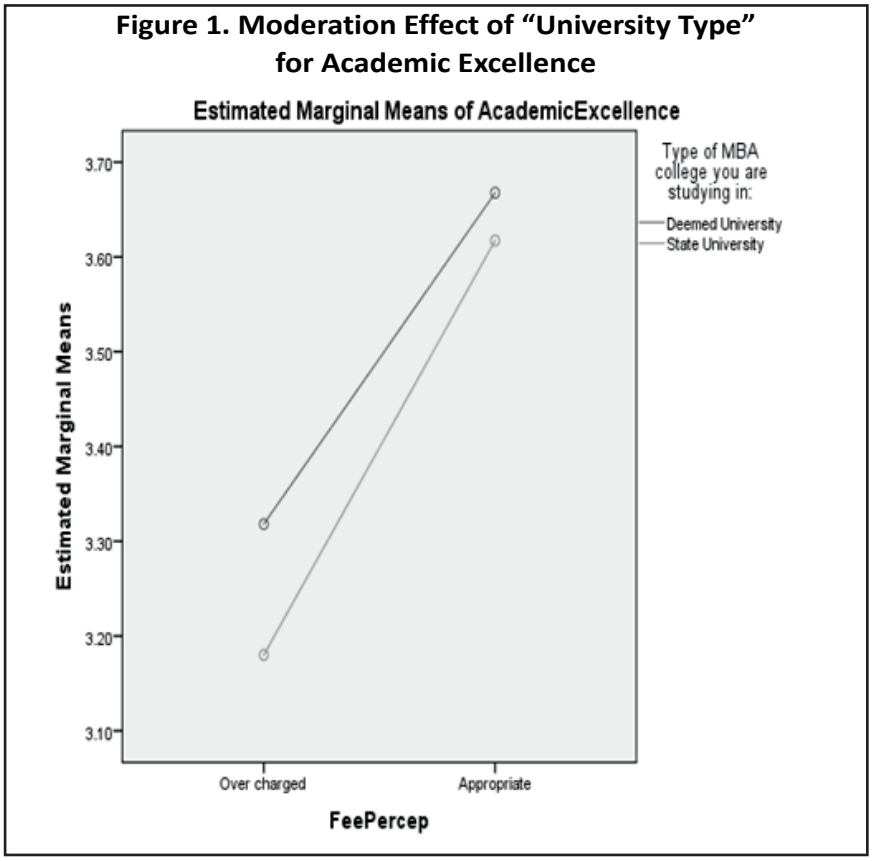


Figure 2. Moderation Effect of "University Type" for Infrastructure

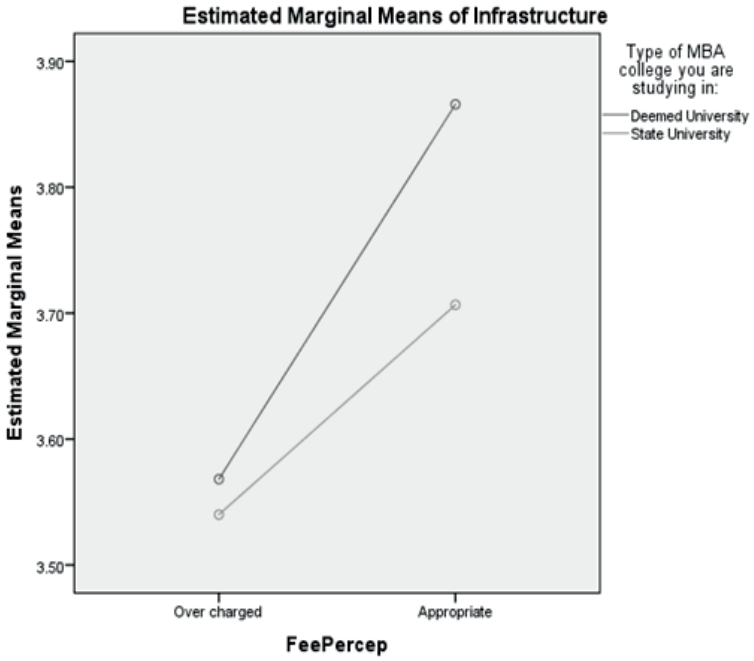


Figure 3. Moderation Effect of "University Type" for Career Aspirations

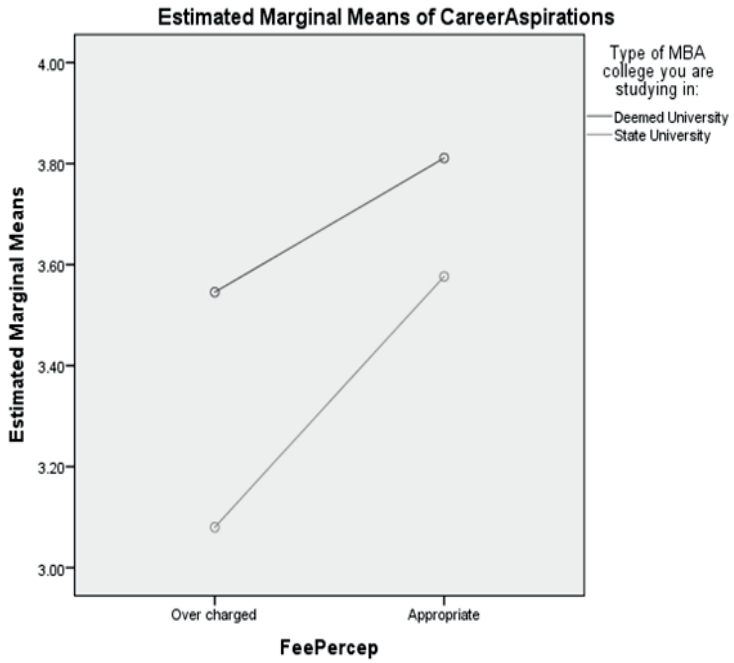
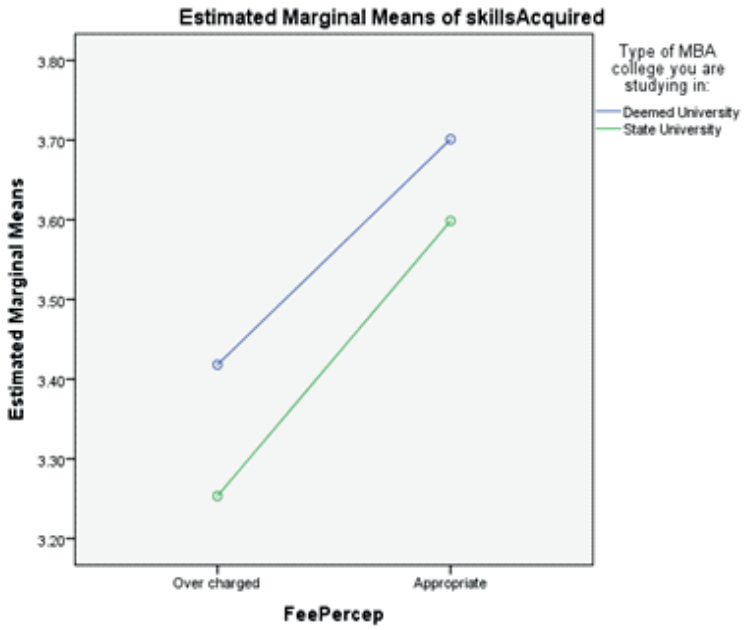


Figure 4. Moderation Effect of "University Type" for Skills Acquired



moderation effect of university type for relationship between appropriateness of fee perception and infrastructure. Hence, both students studying at deemed and state universities equated infrastructure with appropriateness of fee perception. Figure 3 also has parallel lines indicating that influence of fee appropriateness on career aspirations was important to students of both deemed and state universities. Finally, Figure 4 also has parallel lines indicating that students of both deemed and state universities related skills acquired with appropriateness of fee perception.

Conclusion

The results show that deemed and state universities do not differ in educational offerings except for career aspirations ; deemed universities are perceived to be better in fulfilling career aspirations as compared to state universities. However, these universities are perceived to be equal with respect to academic excellence, infrastructure, and skills acquired. The statistical analysis has further revealed that "quality of educational offerings" is a result of perception of appropriateness of fee charged. Overcharging leads to poor rating of educational offerings as compared to appropriateness of fee charging. Interestingly, the interaction effect seems to be not existing, that is, the relationship between "perception of fee appropriateness" and "educational offerings" does not depend on "kind of university." In other words, the right fee charged will help stimulate value proposition irrespective of the kind of university (deemed or state).

This research shows the analysis of exact effects of fee perception on quality of management education of MBA students under colleges affiliated to SPPU and deemed universities in Pune city using factorial MANOVA.

Implications

(1) Implications for Academicians : The study provides a sound basis for concluding that students' perceptions

strongly impact the quality of management education. The findings of the study would enable educators to update the quality parameters with respect to academic excellence in terms of pedagogy, curriculum, subject specialization, and research.

(2) Implications for Management Institutes : Quality of management education currently is a concern for all management institutes. They need to adopt a student-centric approach. The study also provides a detailed insight into the measurement of perception of fee appropriateness and its impact on quality of management education. The results of the study will strongly influence the policies of management institutions. The institutions can be more qualitative, service oriented, and can understand quality perspectives in a better manner as perceived by MBA students.

(3) Implications for the Education Industry : The following are the best practices that the education industry should follow for sustaining quality in education :

NAAC and NBA must consider fee and its perception with respect to measuring quality of higher education offered. They must design policies to ensure that the education process should be standardized, innovative, and at a low/reasonable cost. Emphasis should be on high-quality service delivery, with students treated as the most significant stakeholders. Student-centric strategies should be inculcated across all their policies and activities.

Limitations of the Study and Scope for Further Research

As the scope of the study is limited to Pune city, the findings of the study are applicable only to Pune city and cannot be generalized to other geographical areas. It is a descriptive study with a closed-ended questionnaire, and hence, the potential to capture unique insights is limited. The study covered only two-year full time MBA colleges affiliated with deemed and state university MBA colleges in Pune City. The study is cross-sectional in time dimension and not longitudinal, and hence, a causal relationship cannot be established between the explanatory and outcomes variables under study.

Researchers can repeat this research in different cities to boost the generalization of the findings. This will help researchers gain insights into the notion and perception of quality of management education from students' perceptions across different states and cities in India. Similar studies may be conducted in other cities in India for expanding the area of investigation. A study on the quality of distance education programmes under graduate programmes, online coaching programmes, executive MBAs, and part time programmes can be conducted as many students opt for these programmes too. The study may be repeated by taking into account the expectations and perceptions of management members and recruiters.

Authors' Contribution

Dr. Anita Patankar identified and defined the research problem necessary to lay down the perspective of the study. Dr. Archana Singh performed the literature review and identified gaps in existing research. She was also instrumental in questionnaire designing and data collection. Dr. Roshan Kazi performed the statistical computation and empirically tested the hypotheses. Dr. Divekar supervised the project and edited the paper. The study is a result of group meetings and in-depth discussions from time to time among all the authors on every aspect of the paper.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non- financial interest in the subject matter or materials discussed in this manuscript.

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