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Assessing Quality of Higher Education: An Empirical Study of Commerce Graduates, Kerala State

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ASSESSING QUALITY OF HIGHER EDUCATION: AN EMPIRICAL STUDY OF COMMERCE GRADUATES, KERALA STATE

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Abstract

The paper examines the quality of higher education in the Indian context in terms of subject knowledge (curriculum) together with analytical thinking and communication skills. The study further explores whether there exists any difference in the quality of higher education based on the above three parameters between women and men and if so, in what way is this difference more revealing. In order to accomplish the aforementioned objectives, 416 students belonging to commerce stream from 21 colleges affiliated under four universities in Kerala were selected as the respondents to be administered with an achievement test. The results indicate that the students' overall performance is not satisfactory, as reflected by a low mean with a high variance in the learning outcomes. Besides, an analysis based on Blinder-Oaxaca decomposition technique shows that a significant difference existing in the learning outcomes related to analytical thinking between male and female students is because of the coefficient differences i.e., a significant difference exists even with similar individual characteristics of students, which can be attributed to the presence of gender discrimination in higher education.

Introduction

Indian higher education sector, post-Independence, has witnessed a tremendous growth in terms of the establishment of a number of universities and colleges. At present, India is home to the largest number of higher educational institutions in the world with the second highest higher educational enrolment (FICCI-EY, 2014). In view of an increased demand for public accountability, higher educational institutions all over the world are increasingly being subjected to quality evaluation. In the Indian context, quality assessment of higher educational institutions is done by National Assessment and Accreditation Council (NAAC). It is of importance to note in this context that since 2016, a new system of ranking higher educational institutions in the country -- The National Institutional Ranking Framework (NIRF) -- has been introduced. Further, the outputs of global ranking agencies like The Academic Ranking of World Universities (ARWU), QS World University Rankings and Times Higher Education World University Rankings are also used as pointers to the global competitiveness of higher educational institutions.

Here, it is important to take note of a continued debate among researchers and policy makers on how to define "quality" as such, in general and in the educational context, in particular. Three decades ago, Ball (1985) had raised an interesting question of "what the hell is quality?", even as today researchers continue to grapple with "quality". Typically, there are two approaches to defining "quality". The first is standard-driven i.e., achievement of certain pre-defined standards, say, a mission/vision, specifications or requirements. The second approach relates to the appropriate indicators that reflect the required quality of education being imparted. There are generally four types of performance indicators i.e., Input, Process, Output and Outcome (Borden and Bottrill, 1994). Input indicator constitutes the resources required for supporting institutional programmes, such as human beings,

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finance and physical holdings. Process indicator includes the mode used for delivering educational programmes (Burke, 1998). Both output and outcome measure the upshot of higher education. Quantitative measurement of the result is done through output performance indicator, while outcome is measured qualitatively. An outcome-based approach to quality measurement focuses on the 'value' addition to students in terms of their satisfaction and the qualitative aspect of skills developed from a given course. However, outcome indicator is considered more meaningful in measuring the teaching methodology which, in turn, further helps strengthen the teaching-learning process. In addition, a group of researchers is also of the view that quality is 'subjective' and that it differs according to the perception of an individual (Martin and Stella, 2007; Mishra, 2007; Westerheijden *et al*, 2007).

In the context of higher education, one strand of literature argues that quality of education can be defined based on how students are taught, while the other defines quality based on what students learn rather than how they are taught. Yet another set of literature argues that it is the relevance of students' learning to the job market that constitutes the ultimate 'quality'. More specifically, students, who are the primary stakeholders when it comes to accessing education (Harvey and Knight, 1996), tend to associate quality with the institutions they are part of, scholarship status and extra-curricular activities (Husain and Hossain, 2016). Further, employers (job providers) perceive quality as "fitness for purpose" i.e., skills and competencies of graduates (Henrich, 2016); graduates' employability (Rodman *et al*, 2013); soft skills (Sirat *et al*, 2008). The third stakeholder i.e., employees of the sector (especially teachers) perceive quality of education as 'making a student a complete person' (Tang and Hussin, 2011), while fund providers (funding bodies and community at large), who are the fourth stakeholder, perceive quality as "value for money", in that they look for a reasonable return on investment. Thus, quality of higher education is a multi-dimensional concept and varies according to stakeholders' perceptions. Despite the lack of a consensus regarding the 'quality' of higher education, in the present study, we assert that measurement of quality is very important, considering the significance of higher education to the economic, social and cultural development of the country. Therefore, the broad objective of the paper is to assess the quality of higher education in the Indian context, based on a performance test with regard to the subject knowledge of students pursuing higher education.

However, besides mastering the subject knowledge, to handle different situations in daily life, possessing a combination of different skills, especially critical / analytical thinking ability, which is constructed based on a greater degree of logical reasoning, is equally important (da Silva Almeida and Rodrigues Franco, 2011). Enhancing of thinking ability should be an integral part of the educational system along with reading, writing and memorising of facts (Perkins, 1985). In fact, strengthening of critical/ analytical thinking assumes a greater significance in the context of higher education (Hartnett and Willingham, 1980), as soon after the completion of 'degree', students show a keen interest in joining the job market. This assumes even a greater significance in the Indian context, as the unemployment rate among the educated youth is observed much higher, as compared to the uneducated youth (Bairagya, 2018). Although there are several macroeconomic issues associated with a large number of educated people being unemployed, one cannot completely ignore the issue of skill mismatch and lack of employability skill among the educated as one of the prime reasons, as identified by various reports like India Labour Report (2012), Weebox India Skills Report (2016) etc. In fact, in

addition to analytical thinking, communication skill is also considered another essential component of employability (Zaharim *et al*, 2009; Singh and Singh, 2008; Kearns, 2001; Lankard, 1995; Mayer and Australian Education Council Committee, 1992; Abdullah and Kamaludin, 2007).

However, one may argue that creation of a quality workforce suitable to the job market requirements is not the only goal of higher education. In this context, what is important to note is that improvement in critical thinking and communication skill not only helps enhance the employability of an individual but also the overall quality of life. For instance, a study by Paul (2005) argues that people with good critical thinking are in a much better position to take right decisions. These right decisions, in turn, help them enjoy a better quality of life as compared to those with a relatively low critical thinking ability (Bruine de Bruin *et al*, 2007).

Considering the absolute relevance of analytical thinking and communication skill to the overall 'quality' of education, as also to the job market, the paper examines the quality of higher education in the Indian context in terms of subject knowledge (curriculum) together with analytical thinking and communication skill. The study also explores whether there exists any difference in the quality of higher education based on the above three parameters, between women and men, and if so, in what ways is this difference more revealing.

The rest of the paper is organised as follows. Section-2 outlines the data and methodology of the study. Descriptive results of higher educational learning outcomes based on an achievement test are presented in section-3. Section-4 discusses the determinants of higher education quality, followed by conclusion in section-5.

Data and Methodology

In order to accomplish the aforementioned objectives, a multi-stage random sampling method was followed for identifying the respondents for the study. Out of a total of 213 Arts and Science colleges in Kerala, comprising 153 Aided colleges and 60 Government colleges (Economic Review, 2016, p. 187), 183 colleges offer commerce course. In the first stage of the sampling, based on four universities in Kerala, four clusters were formed. Within each cluster, sub-clusters were formed subsequently depending on the nature of college management, grades assigned by NAAC and location of colleges. It was only those students enrolled for the final semester of Undergraduate and Post-graduate courses who were included in the sample in view of the possibility of their joining the job market immediately on completion of their courses. In this context, it is important to mention that the data collected from the examination wings of the universities concerned revealed that a total of 25,935 students from four Universities in Kerala had appeared for 5th semester B.Com and 3rd semester M.Com examinations. Based on this statistics, the researchers confined the sample size to 416 students with different socio-economic backgrounds, an adequate sample size for the study based on the criterion suggested by Krejcie and Morgan (1970).

For assessing the quality of students, we designed an achievement test for the subject domain of Commerce containing ten questions and a skill-test for Communication skill and analytical thinking consisting of five questions each. Questions were framed by giving a proper weightage to learning outcomes and difficulty levels. In this context, it is to be noted that each of the four Universities in

Kerala follows its own syllabus, lacking in uniformity. Keeping this in view, to ensure a fair comparability of scores across Universities, questions were framed from subjects common to all Universities. Ten questions from core and common papers like Financial Accounting (3 questions), Cost Accounting (2 questions), Financial Management (2 questions) Financial services (3 questions) were identified as test components.

As mentioned in the previous section, over and above the mastering of subject knowledge, for handling different situations in daily life, it is also important to possess a combination of different skills, especially critical / analytical thinking ability and communication skill. Hence, we incorporated questions related to the same for the quality assessment test. Moreover, it is also important to mention that from the interaction with the co-ordinators of placement cells of respective colleges, it was learnt that a majority of Commerce graduates had come to be employed in Banking and Insurance sectors, followed by Accounting profession. Communication skill and analytical thinking were considered as major skills required to be employed in the above sectors. Further, questions related to daily conversations with customers and identification and correction of errors in a business communication (which are very fundamental) were included for assessing the communication skills of students. Five questions, carrying an equal weightage, were included under communication skill and analytical thinking each.

Moreover, the content validity of questions was ensured through holding consultations with experts in the relevant field. Twenty students were selected from each college on a random basis to be administered with a test and three versions of the question paper set to ensure that no adjacent pair of students answered the same set of questions. The ordering of multiple-choice questions and the options for correct answers was different for the three versions, while in all other respects, the three versions were identical. In total, we selected 21 colleges with 416 students appearing for the test. Examinees were given 30 minutes to complete the entire test under the supervision of the investigator.

Out of 21 colleges considered for the study, an equal weightage was given to A grade and B grade colleges (based on NAAC ranking) and colleges under rural and urban areas for a fair comparison of the two categories. Colleges with an equal proportion to the population were chosen from each University. Further, of the total 416 respondents, 67 percent were female and the remaining 33 percent male in our study sample in order to keep parity with the percentage shares of male and female participation in university education in Kerala state[3].

Higher Education Learning Outcomes based on the Achievement test

For achievement test, questions related to the subject domain carried 10 marks (each question with 1 mark) and questions related to communication skill and analytical thinking carried five marks each (each question with 1 mark). The descriptive statistics based on the achievement test result is appended in table 1.

[3] The total number of Commerce students enrolled in various Arts and Science colleges (excluding unaided colleges) under the four general universities in Kerala during 2015-16 was 39923 out of which, 24915 (62.41%) were girls (Economic Review 2016, p. 212).

Table 1: Descriptive Statistics Based on the Achievement Test Result

Variable	No. of observations	Mean marks	Standard Deviation of marks	Minimum marks	Maximum marks
Total Score (out of 20)	416	7.20	2.53	1.5	14
Subject Score (out of 10)	416	3.58	1.58	0	8.5
Reasoning Score (out of 5)	416	1.91	1.14	0	5
English Score (out of 5)	416	1.70	1.00	0	5

Source: Authors' computation based on primary survey.

The result of achievement test (table-1) shows a low mean with a high variance in terms of the test scores achieved by students. The average combined test score is 7.20, which is 36 per cent of the total score, whereas, it is 35.80 per cent for the subject test, 38.20 in the case of reasoning test and 34.08 per cent for English test. Further, inequality in scores, based on percentile distribution, is depicted in table-2.

Table 2: Percentile Distribution of Learning Outcomes.

Percentile	Total Score	Subject	Reasoning	English
10^{th}	13.46	22.28	37.26	16.59
20^{th}	21.88	24.28	37.26	37.26
30^{th}	36.54	46.88	37.26	37.26
40^{th}	**45.19**	**46.88**	**71.88**	**52.88**
50^{th}	53.37	52.88	71.88	52.88
60^{th}	60.34	69.71	71.88	73.08
70^{th}	72.12	75.48	71.88	73.08
80^{th}	82.69	86.78	91.11	83.41
90^{th}	91.11	93.99	91.11	94.95
100	100	100	100	100

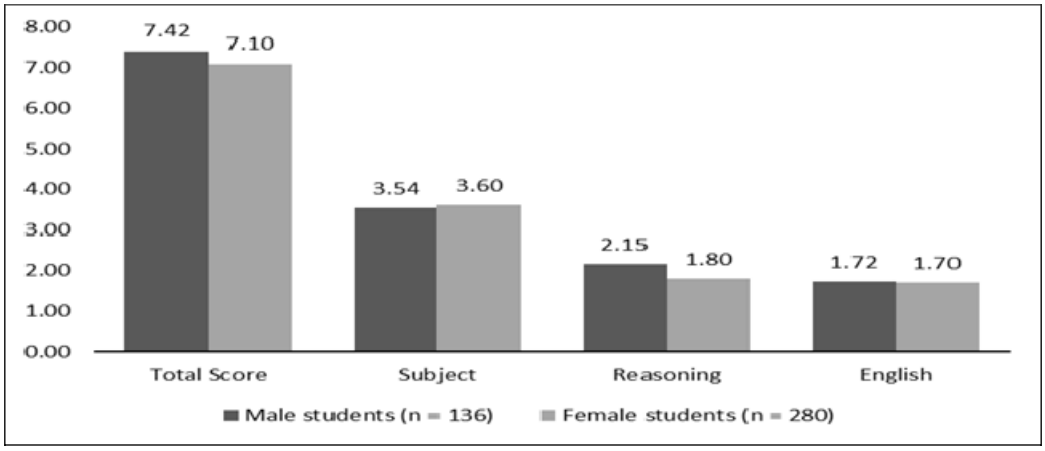
Source: Authors' computation based on primary survey.

Table-2 depicts that 45.19 per cent of students could not score more than 40 per cent marks in the overall score, which is far below the minimum score for many competitive examinations. Inequality in the Reasoning score is very wide with 71.88 per cent of students scoring less than 40 per cent marks, while 46.88 percent and 52.88 percent of students scoring less than 40 per cent marks in English and subject tests, respectively. The total score, as well as the scores for subject, reasoning and English, are far below the cut-off mark (score of candidates placed in the bottom of rank list) fixed for many competitive examinations meant for Commerce graduates. For instance, the cut-off mark for the written test for Lecturer in Commerce for polytechnic colleges fixed by Kerala Public Service Commission 2015 was 53.67 percent; UGC NET for JRF was 62 percent and UGC NET for Lectureship was 54.67 percent for commerce graduates for the year 2018 December. For the above competitive examinations, subject knowledge accounted for utmost importance, but 69.71 percent of students scored less than 60 percent in the subject based on our achievement test. Moreover, for some other competitive examinations, which give more importance to English and reasoning, their cut-off mark was even higher. For instance, the cut-off mark for CAT examinations 2016 for IIMs was 90 percent. As per our achievement test, only

8.89 percent of students in reasoning and 16.59 percent of students in English could score more than 80 percent.

In this context, it is important to find out whether test scores differ significantly on the basis of institution (management-wise and grade-wise), university and gender.

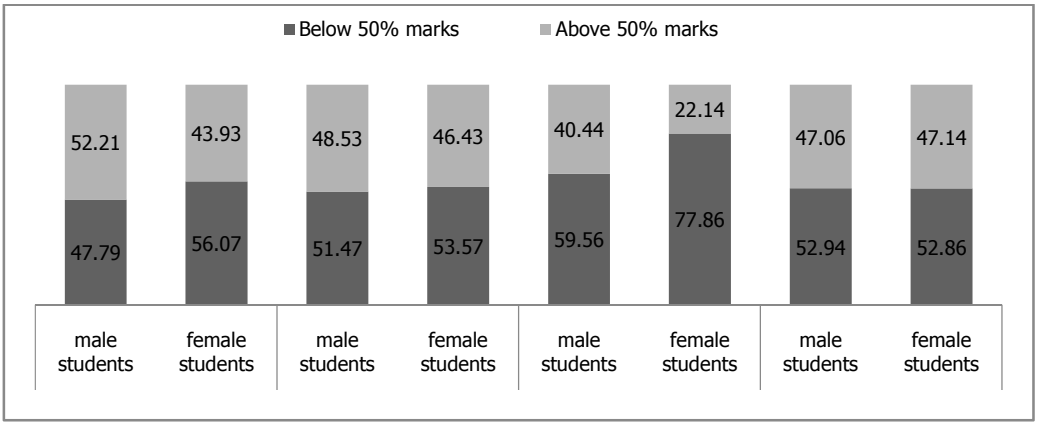
Figure 1: Learning Outcomes by Gender



Source: Authors' computation based on primary survey.

Figure-1 shows that male students account for a marginally higher mean score for the overall learning outcomes than female students in our study. It is, in this context, very important to remember that the findings are specific to a subject, commerce and cannot be generalised for the entire higher education and also for other regions. However, while achievement score for subject is higher for female students as compared to male students, male students have performed better when it comes to the reasoning section. In the case of English score, male and female students' performance is almost the same.

Figure 2: Learning outcomes –Distribution by 50th Percentile

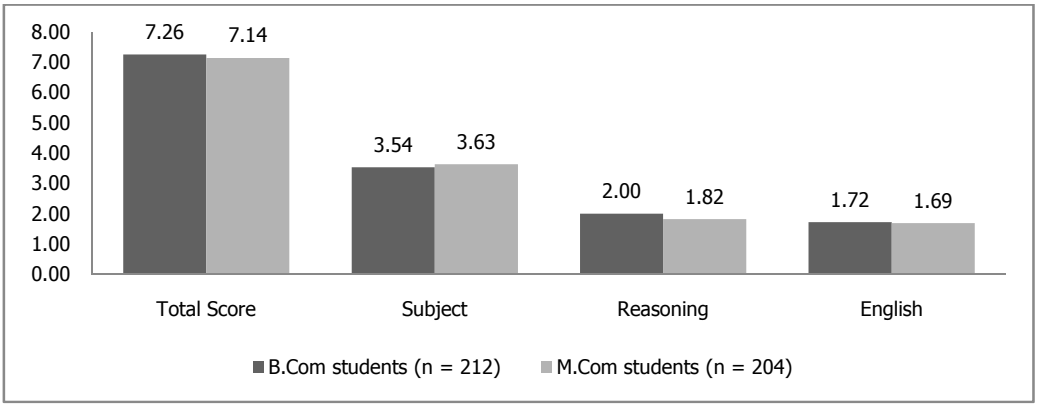


Source: Authors' computation based on primary survey.

However, when it comes to the distribution of marks by above and below 50th percentile, in respect of the overall score, 47.79 percent of male students account for below 50 percent marks, while 56.07 percent of female students for below 50 percent marks, showing a greater inequality among female students in terms of the overall score. The gender difference in the distribution of marks by above and below 50th percentiles is marginal for subject and English learning scores. However, the gender difference is more visible for the learning outcome of reasoning test with 77.86 per cent of female students scoring below 50 percent marks, while only 59.56 per cent of male students belong to this category, showing a greater inequality among female students in terms of the reasoning score as well.

It is imperative to mention here that the questions for achievement test were prepared considering the academic level of final year B.Com students. The same test was administered to the final year B.Com and M.Com students with the achievement test scores of B.Com and M.Com students presented in figure-3.

Figure 3: Learning Outcomes of B.Com and M.Com Students



Source: Authors' computation based on primary survey.

Normally, M.Com students should have scored better as compared to B.Com students. But the result shows that B.Com students account for a higher mean in the overall score than M.Com students. M.Com students have certainly performed better in terms of mean score in the subject-related section. Surprisingly, it is seen that the performance of B.Com students is relatively better than M.Com students when it comes to mean scores related to English and reasoning. One of the reasons could be that some of the top B.Com students did not pursue M.Com in the same universities. They might have mostly moved towards professional courses like MBA, Chattered-Accountancy, Cost-Accountancy, etc. Even in some cases, they might have joined M.Com course, but in some other better universities. Moreover, in order to see whether there exist any differences in the achievement test scores of B.Com and M.Com students between male and female students, we have estimated the same by gender and presented in table-3.

Table 3: Learning Outcomes of B.Com and M.Com Students by Gender

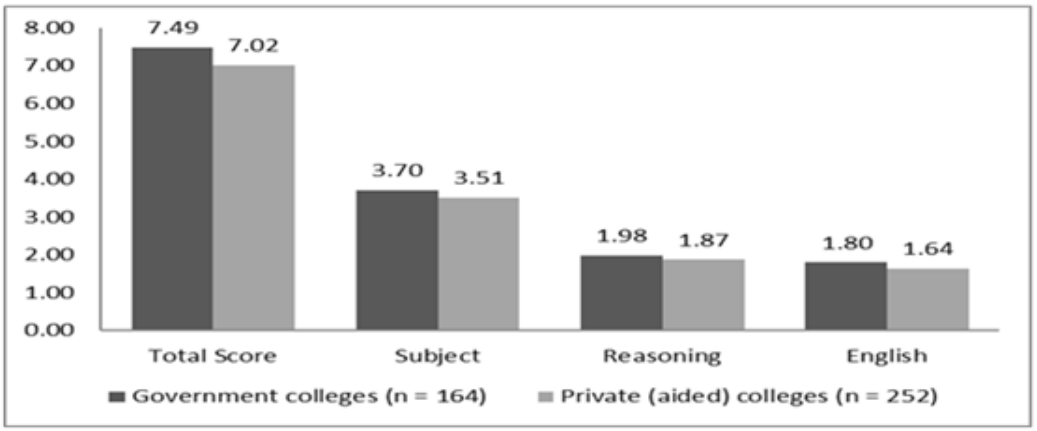
	Male		Female	
	B.Com (n = 104)	M.Com (n = 32)	B.Com (n = 108)	M.Com (n = 172)
Total Score	7.52	7.06	7.00	7.16
Subject	3.52	3.61	3.55	3.64
Reasoning	2.22	1.94	1.80	1.80
English	1.78	1.52	1.66	1.72

Source: Authors' computation based on primary survey.

Interestingly, table-3 shows that B.Com male students have accounted for a higher overall score than M.Com male students, while B.Com female students account for a lower score than M.Com female students. M.Com students – both male and female – have certainly performed better when it comes to subject-related questions. Although the performance of B.Com male students is relatively better than M.Com male students in respect of English and reasoning tests, the same cannot be said of female students. In fact, M.Com female students' performance is far better than B.Com female students with respect to reasoning. The possible reason could be that a section of top male students moved to professional courses after completing B.Com, while top female students continued with the same universities by joining M.Com course.

Moreover, there is a debate that has been going on for some time regarding the 'quality' of education being imparted in government institutions vis-à-vis private institutions. As regards school education, the average learning outcomes of students studying in private schools is way above government schools (Annual Status of Education Report, 2013) and identifying the underlying reasons has gained attention in the existing studies, such as, Muralidharan and Kremer (2006), Chudgar and Quin (2012), Singh (2015) etc. The debate is relevant to the context of higher education as well and hence, calls for an empirical assessment of the differences in the learning outcomes of students studying in government and private colleges. Accordingly, the mean learning outcomes of students by government and private (aided) colleges are presented in figure 4.

Figure 4: Learning Outcomes by Government and Private (aided) Colleges.



Source: Authors' computation based on primary survey.

Figure-4 shows that the average learning outcomes of Government College students is better than that of their counterparts (private aided colleges) with respect to the overall scores as well as all the three sections i.e., subject, reasoning and English, which portrays a sharp contradictory picture of the public-private divide in terms of the quality of school education in India. Even the mean difference in the total score between students of Government and Private Aided colleges is found statistically significant, based on the two-sample t-test results with an unequal variance. In addition to the public-private divide, the quality of education may differ by universities to which the colleges are affiliated. Therefore, the average test scores of students across four universities in Kerala are presented in table-4.

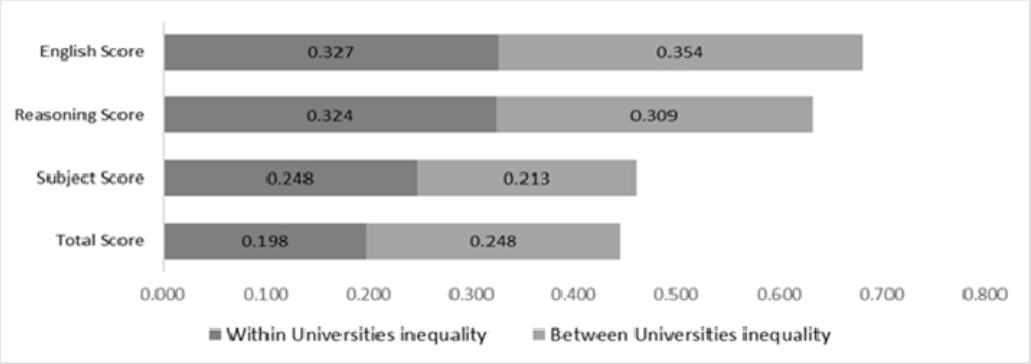
Table 4: Learning Outcomes by universities to which the colleges are affiliated

	Total Score	Subject	Reasoning	English
Kerala University	6.66	3.32	1.78	1.57
MG University	7.12	3.54	1.98	1.60
Calicut University	8.01	3.81	2.17	2.02
Kannur University	7.21	3.76	1.72	1.74

Source: Authors' computation based on primary survey.

Table-4 depicts that the average learning outcomes of students from colleges affiliated to Calicut University are better for all the sections of the test (i.e., subject, reasoning and English) than students from colleges affiliated to other universities in Kerala. Further, students from colleges affiliated to Kannur university account for the second highest score in terms of the total score. One can relate the performance differences of students in the achievement test, especially the reasoning section, to the curricula they follow in the above universities. When we compare the curricula across four universities of Kerala, at the time of data collection (i.e., in 2016), apart from core papers, University of Calicut had a paper related to 'Numerical skills', while Kannur University had a paper on 'Numerical Skills for Business' in its B.Com syllabus. Therefore, one may argue that the introduction of 'Numerical skills' in the syllabus may have played an important role in enhancing the reasoning/analytical skills of students studying in the above universities. In addition to estimating the differences in the mean learning outcomes of students from colleges under different universities, we have also estimated intra-university inequality and inter-university inequality in the learning outcomes of students and presenting the same in figure-5. Figure-5 depicts that high inequality exists across students in their learning outcomes because of both inequality within universities and inequality between universities. Moreover, both intra-university inequality and inter-university inequality are higher for sections on English and reasoning as compared to the subject score. What is more interesting to note is that inter-university inequality is higher than intra-university inequality for English, whereas intra-university inequality is higher than inter-university inequality for reasoning and subject, implying that universities can also make a significant difference to English learning.

Figure 5: Intra-university Inequality and Inter-university Inequality in the Learning Outcomes of Students



Source: Authors' computation based on primary survey.

Determinants of higher education quality

To identify the determinants of quality, an ordinary least square (OLS) regression analysis has been used. The dependent variable (quality of higher education) was measured through an achievement test administered to students. The test consisted of 20 questions of which 10 questions related to the subject domain and five questions each to communication skills and analytical thinking, respectively. The explanatory variables considered for the Regression model for estimating the determinants of quality are described in table 1A in the appendix and the regression results of the determinants of quality of higher education are presented in table-5.

Moreover, a descriptive analysis carried out in the previous section shows that there exists a difference in the learning outcome between male and female students. Further, gender differences in degree performance may arise for a number of reasons such as individual-specific attributes (family background, age and marital status) (Hoskins *et al*, 1997; Rudd, 1984) or differences in the type and quality of institutions that male and female students attend (Mellanby *et al*, 2000). However, differences caused by endowment factors apart, another form of difference may continue to exist, which can be considered as a reflection of discrimination against female students.

We have started with a basic linear model of the determinants of learning outcomes,

$$(LO)_i = X_i\beta_i + \varepsilon_i \qquad (1)$$

where, LO represents the learning outcomes of students with students divided into two groups: male (m) and female (f). The learning outcomes depend on the explanatory variable X_i, which includes the socio-economic characteristics of individual students i.

Following Blinder-Oaxaca method of decomposition technique (Jann, 2008), the extent of LO differences (LOD) between male and female can be written as

$$LOD = (\overline{Xm} - \overline{Xf})\hat{\beta}f + \overline{Xf}(\hat{\beta}m - \hat{\beta}f) + (\overline{Xm} - \overline{Xf})(\hat{\beta}m - \hat{\beta}n) \qquad (2)$$

where Xm and Xf are the vector of covariates for male and female students respectively, and βm and βn represent the vector of coefficients for male and female students respectively.

The first part of equation (2) accounts for differences in the learning outcomes between male and female students due to endowment effect, whereas, the second part represents differences in the learning outcomes between male and female students due to coefficient difference and can be attributed to discrimination. The third part is the interaction between endowment difference and coefficient difference in the learning outcomes between male and female students.

Table 5: OLS regression results of the determinants of quality of higher education (total score).

	Total Score
Female	-0.693*** (0.261)
Both father and mother graduate	0.227 (0.446)
Only father graduate	0.648 (0.603)
Only mother graduate	0.31 (0.463)
Family income	0 (0)
Marks in previous exam	0.083*** (0.014)
Frequently read newspaper	0.706** (0.352)
Frequently read business dailies	3.031*** (0.726)
Frequently read academic journals	0.262 (0.466)
Frequently watch national/international news channels	0.784* (0.436)
Classroom interaction in English majorly	-0.096 (0.313)
Urban	0.025 (0.262)
Government college	0.046 (0.277)
Reasoning included in curricula	1.232*** (0.265)
Constant	-0.185 (1.128)
	N= 416 F(14, 401)= 6.86 Pr>F= 0 R^2 = 0.19

Source: Authors' computation based on primary survey.

Note: *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.

Table-5 shows that there exists a negative and significant relationship between female students and a better overall learning outcome. Moreover, the variable related to 'marks in previous examination' is positive and significant for the overall score. The variables related to 'frequently read newspaper', 'frequently read business dailies' and 'frequently watch national/international news channels' have a positive and significant impact on the overall learning outcomes. Most importantly, the

variable related to 'reasoning included in the curricula' has a positive and significant impact on the overall score.

However, when it comes to the bifurcation of the total score by three components i.e., subject, reasoning and English and identifying the determinants separately, it is important to mention that these three components might be interdependent. In fact, existing literature also argues in favour of the above interdependency. For instance, in a study, Bowen (2018) observes that students in his study reported that their ability to think critically was significantly influenced by their college experiences. Therefore, instead of running separate OLS regressions for subjects, reasoning and English outcomes, we have used a seemingly unrelated regression (SUR) model for identifying the determinants of these three components, considering interdependency of their residuals.

Table 6: Seemingly Unrelated Regression Results of the Determinants of Subject, Reasoning and English Scores.

	Subject	**Reasoning**	**English**
Female	-0.182 (0.166)	-0.458*** (0.121)	-0.053 (0.105)
Both father and mother graduate	-0.235 (0.283)	0.09 (0.206)	0.362 (0.18)
Only father graduate	0.176 (0.383)	0.308 (0.279)	0.164 (0.244)
Only mother graduate	-0.003 (0.294)	0.251 (0.214)	0.061 (0.187)
Family income	0 (0)	0 (0)	0 (0)
Marks in previous exam	0.041*** (0.009)	0.027*** (0.006)	0.016*** (0.006)
Frequently read newspaper	0.546** (0.223)	-0.124 (0.163)	0.284** (0.142)
Frequently read business dailies	1.961*** (0.461)	0.513 (0.336)	0.557* (0.293)
Frequently read academic journals	-0.121 (0.295)	-0.141 (0.216)	0.524*** (0.188)
Frequently watch national/international news channels	-0.113 (0.277)	0.611*** (0.202)	0.286 (0.176)
Classroom interaction in english majorly	0.335* (0.199)	-0.154 (0.145)	-0.277** (0.126)
Urban	0.069 (0.167)	0.066 (0.122)	-0.11 (0.106)
Government college	-0.23 (0.176)	0.124 (0.129)	0.152 (0.112)
Reasoning included in curricula	0.502*** (0.168)	0.242** (0.123)	0.488*** (0.107)
Constant	-0.134 (0.716)	-0.194 (0.522)	0.143 (0.456)
No. of observations Parameters RMSE R-sq Chi2 Probability	416 14 1.466 0.14 66.81 0	416 14 1.07 0.11 52 0	416 14 0.933 0.13 61.01 0

Source: Authors' computation based on primary survey.

Note: *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.

Results based on the SUR model in table-6 show that though there exists a negative and significant relationship between female students and a better outcome for reasoning related questions, this coefficient is insignificant for subject and English sections. Moreover, the variable related to 'marks in previous examination' is positive and significant for all the three components i.e., subject, reasoning and English. The variables related to 'frequently read newspaper' and 'frequently read business dailies' have a positive and significant impact on subject and English learning. Further, the variable 'frequently watch national/international news channels' has a positive and significant impact on reasoning and English learning scores. Most importantly, the variable related to 'reasoning included in the curricula' has a positive and significant impact on all the three sections - subject, reasoning and English tests.

As SUR is a system approach and has solved all the three equations (subject, reasoning and English) considering a system of simultaneous equations, we have estimated the correlation matrix of residuals of the three equations (table-7) and also provided the results of the Breusch-Pagan test of independence as part of understanding whether there exists any significant relation between these three equations.

Table 7: Correlation Matrix of Residuals of the Equations Related to the Determinants of Subject, Reasoning and English Scores

	Subject	Reasoning	English
Subject	1		
Reasoning	0.153	1	
English	0.129	0.072	1
Breusch-Pagan test of independence: chi2(3) = 18.843, Pr = 0.0003			

From Table-7 it is evident that the correlation of residuals for subject and reasoning is 0.153, 0.129 for subject and English and 0.072 for reasoning and English. Moreover, statistically significant Chi2, based on the Breusch-Pagan test of independence, indicates that the null hypothesis (correlation is zero among the errors) can be rejected. Therefore, it can be inferred that there exists a relation among the error terms across the three models.

The reasons for the above differences in the learning outcomes of male and female students have been identified using Blinder-Oaxaca Decomposition technique for linear regression following (Jann, 2008) and are presented in table-8.

Table 8: Blinder-Oaxaca Decomposition of Learning Outcomes by Gender

	Total score	Subject	Reasoning	English
Male	7.42*** (0.23)	3.54*** (0.14)	2.15*** (0.10)	1.72*** (0.09)
Female	7.10*** (0.15)	3.60*** (0.10)	1.80*** (0.07)	1.70*** (0.06)
Difference	0.32 (0.28)	-0.06 (0.17)	0.36*** (0.12)	0.02 (0.11)
Endowments	-0.42** (0.19)	-0.25** (0.11)	-0.11 (0.07)	-0.06 (0.07)
Coefficients	0.57 (0.35)	0.23 (0.22)	0.39** (0.16)	-0.05 (0.14)
Interaction	0.17 (0.28)	-0.04 (0.17)	0.08 (0.13)	0.13 (0.11)

Source: Authors' computation based on primary survey.

Note: *, ** and *** indicate statistical significance at 10%, 5% and 1% levels respectively.

Table-8 shows that the difference in the learning outcomes of male and female students is significant only for reasoning section and insignificant for subject and English sections. Moreover, reasoning outcome differences between male and female students due to endowment effects is not statistically significant. Further, the interaction between endowment difference and coefficient difference does not have a significant impact on the reasoning outcome differences. A significant difference existing in the learning outcomes is mainly because of the coefficient differences. More specifically, the significant differences in the learning outcomes between male and female students exist even with similar individual characteristics of students, as indication of the presence of gender discrimination in higher education.

Conclusion and Policy Implications

The quality of higher education, based on an achievement test, display a low mean with a high variance in the leaning outcomes of both male and female students. The total score as well as the test scores, separately for subject, reasoning and English are found far below the cut-off marks fixed for many competitive examinations meant for Commerce graduates. More importantly, students' Reasoning score is very low with 71.88 per cent of students scoring less than 40 per cent of marks. The proportion of students scoring below 40 percent of marks in English test and subject test constitutes 52.88 and 46.88 percent, respectively.

Moreover, male B.Com students account for a higher mean in respect of the overall score than male M.Com students, while female B.Com students account for a lower mean sore than female M.Com students. M.Com students' (both male and female) average performance is certainly better when it comes to subject related questions. Although the average performance of male B.Com students is relatively better in respect of English and reasoning as against male M.Com students, the same cannot be said of female students. In fact, female M.Com students' reasoning performance is far better than female B.Com students. The possible reason could be that a section of top male students moved over to

professional courses after B.Com, while top female students continued with the same universities by joining M.Com programme.

The difference in the learning outcomes of male and female students is significant only for the reasoning test, while the same is insignificant for subject and English tests. The significant differences existing in the learning outcomes related to reasoning test are mainly because of the coefficient differences i.e., a significant difference exists even with similar individual characteristics of students, which can be attributed to the presence of discrimination in higher education.

Moreover, the variable related to 'marks in previous examination' is positive and significant for the overall score as well as subject, reasoning and English tests. The variables related to 'frequently read newspaper' and 'frequently read business dailies' have a positive and significant impact on subject and English learning outcomes, while the variable 'frequently watch national/international news channels' has a positive and significant impact on reasoning and English learning scores. Most importantly, the variable related to 'reasoning included in the curricula' has a positive and significant impact on the overall score as well as all the three sections -- subject, reasoning and English. This scenario certainly has a policy implication in terms of a continuous revision of curricula to make the subject up-to-date and relevant to the job market. Skills required by industries and skills enlisted in National Skill Qualification Framework (NSQF) should be taken as a benchmark for curriculum revision which, in turn, will help reduce the skill gap existing among graduates.

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Appendix

Table 1A: Distribution of the Sample by Gender across Government and Private Aided Colleges

Gender	Government	Aided	Total
Male	32 (20)	104 (41)	136 (33)
Female	132(80)	148(59)	280 (67)
Total	**164 (100)**	**252 (100)**	**416(100)**

Note: Figures in the parentheses represent percentage shares.

Source: Authors' computation based on primary survey.

Table 2A: Explanatory Variables for Identifying the Determinants of Higher Education Quality

Variables	Interpretation	Variable defined
Gender	Gender has a significant impact on the academic achievement of students (Singh, 2011).	1 - Female Base - Male
Parents' level of education	Socio-Economic background of students has a significant impact on their learning achievements (Liu and Liu, 2004; Crosnoe *et al*, 2004; Smits, 2007; Tomul and Polat, 2013; Graetz, 1995). Further, level of education and income of parents determines students' achievement (Devadoss and Foltz, 1996).	1 - Both Father and mother are graduate Base - Otherwise
Family income	Further, level of income of parents determines students' achievement (Devadoss and Foltz, 1996).	
Mark of previous course	Previous educational achievements of students are an indicator of future achievement (Bratti and Staffolani, 2013).	
Reading habits of students	There exists a positive correlation between reading habits and academic performance of students (Issa *et al*, 2012).	1 - Frequently read newspaper Base - Otherwise Frequently read business dailies Base - Otherwise Frequently read academic journals Base - Otherwise
Watching national/international news channels	Frequently watching national/international news channels may enhance general awareness.	Frequently watching national/ international news channels
Medium of Instruction	Performance of graduate students varies with the medium of instructions (Ali *et al*, 2013)	1 - Use of English for classroom interaction Base - Otherwise
Nature of management and Location of the institution	Academic performance of students in public and private senior secondary schools differs considerably (Alimi *et al*, 2012)	1 - Government Base - Private (aided) 1 - Urban Base - Rural
Whether reasoning included in the curricula	Inclusion of 'Numerical skills' in the syllabus may have played an important role in enhancing the reasoning/analytical skills of students	1 - Reasoning included in the curricula Base - Otherwise

Table 3A: Descriptive statistics of the explanatory variables used for identifying the determinants of higher education quality

Variable	No. of observations	Mean	Standard deviation	Minimum	Maximum
Female	416	0.673077	0.469654	0	1
Both father and mother graduate	416	0.084135	0.277924	0	1
Only father graduate	416	0.038462	0.192539	0	1
Only mother graduate	416	0.067308	0.250856	0	1
Family income	416	31707.09	44368.51	4000	450000
Marks in previous exam	416	83.4976	8.926203	50	98
Frequently read newspaper	416	0.134615	0.341723	0	1
Frequently read business dailies	416	0.026442	0.16064	0	1
Frequently read academic journals	416	0.069712	0.254967	0	1
Frequently watch national/international news channels	416	0.076923	0.26679	0	1
Classroom interaction in english majorly	416	0.293269	0.455809	0	1
Urban	416	0.439904	0.496973	0	1
Government college	416	0.394231	0.489273	0	1
Reasoning included in curricula	416	0.403846	0.491258	0	1

Source: Authors' computation based on primary survey.

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