



STUDYING PERFORMANCES OF STUDENTS BETWEEN IN-SEMESTER AND END-SEMESTER EXAMINATIONS: A COMPARATIVE CASE STUDY

Dr. Nazimuddin Ahmed

Assistant Professor, Department of Statistics, D.H.S.K. College, Dibrugarh, Assam, India.

Abstract

In this paper an attempt has been made to study the comparative analysis between in-semester examination (internal assessment) and end-semester examination marks. To meet the stated objective a sample of students has been taken from the two significant colleges from Dibrugarh, Assam, India; of a particular semester (Semester-V), 2015, by stratified random sampling under proportional allocation.

The statistical analysis has been carried out using Karl Pearson correlation coefficient and t-test of significance in addition to simple descriptive statistics.

Key Words: Descriptive Statistics, Correlation Coefficient and T Test of Significance.

1. Introduction

One of the major components of our education system is examination. The education process in any discipline of learning ends with examinations. The entire effort put in by the teachers on teaching and the student on learning is centred on getting good results in the examinations. Thus examinations have been overriding the process of education and are a matter of concern for stakeholders.

National Assessment and Accreditation Council in its endeavour to bring in quality in the higher education institution, wanted to propagate these innovative practices that are successfully undertaken by the different institutions to other institutions also.

In the present context, the general under-graduate courses under Dibrugarh University are: Bachelor of Arts, Bachelor of Science and Bachelor of Commerce, comprising each of three years duration distributed in six semesters from 2011-2012.

The examination and evaluation systems of Dibrugarh University for undergraduate general courses shall be done on a continuous basis. There are 20% marks for internal assessment (in this paper we called as a In-semester examination) and 80% marks for End-semester examination in each course during every semester. The two examinations evaluation systems are briefly explained as follows:

- *Internal assessment system:* The 20% internal assessment marks in each course is distributed as under:
 - 25% of marks allotted for internal assessment (IA) in first sessional examination (written) to be conducted and evaluated by respective department.
 - 25% of marks allotted for IA in second sessional examination (written) to be conducted and evaluated by respective department.
 - 25% of marks allotted for seminar/group discussion etc. in IA.
 - 25% of marks allotted for attendance in IA are explained below:

Range of % for attendance	70% – 80%	80% – 85%	85% – 90%	90% – 95%	95% – 100%
Marks to be awarded	1	2	3	4	5

Each sessional examination shall be conducted by the concerned department of the course. The setting of question paper, invigilation duty and evaluation of answer scripts for each paper shall be done by the concerned department. In internal assessment, different tools may be employed such as written tests, assignments, paper presentation, laboratory work, etc. suitable to the courses.

- *Endsemester examination system:* There shall be one End semester examination carrying 80% Marks in each course of a Semester covering the entire syllabus prescribed for the course. The End semester examination is normally a written / laboratory-based examination / Project Work / Dissertation.

2. Objective of the study

The main objective of the present work is to examine if there is any existence of bias or discrimination in the securing of marks by students in-semester examination and to test whether there is any relationship presents in between in-semester and end-semester examination marks obtained by students of 5th Semester, D.H.S.K. College and M.D.K.G. College, Dibrugarh, Assam 2015.



3. Brief description of the two Colleges

3.1. Dibrugarh Hanumanbux Surajmal Kanoi College (D.H.S.K. College)

The DHSK College, originally named the Dibrugarh College way back in 15th June, 1945, later on came to be renamed after its donors as Dibrugarh Hanumanbux Surajmal Kanoi College in 1957. It is a pleasure to remember even today that Dr. Sarvapalli Radhakrishnan, the then Vice-President of India inaugurate the College. The College is permanently affiliated to the Dibrugarh University as a provincialised institution whose academic activities are guided and controlled by the Dibrugarh University and whose financial aspects are chiefly dependent on the Department of Higher Education, Government of Assam and University Grants Commission. The College is accredited with a “B++” certificate by NAAC in 2003. The various departments of DHSK College are:

1. Anthropology	6. Chemistry	11. Geography	16. Sanskrit
2. Assamese	7. Economics	12. Mathematics	17. Statistics
3. Bengali	8. English	13. Philosophy	18. Zoology
4. Botany	9. Hindi	14. Political Science	
5. Computer Science	10. History	15. Physics	

3.2. Monohari Devi Kanoi Girls College (MDKG College)

Monohari Devi Kanoi Girls (MDKG) College, situated in Dibrugarh, in Assam, is an aided women’s college. The college was founded in 1992 and named in the memory of Monohari Devi Kanoi, who played a noticeable role in the formation of the college. The college is centrally located at Kadamoni 11/2 K.M. from the Dibrugarh Railway Station and the city is well connected by roads, railways & airways. The college is well-equipped with all basic amenities within a nice and calm campus. MDKG College is affiliated to Dibrugarh University and accredited with a “B++” certificate by NAAC. The college offers several undergraduate courses in Arts subjects. The various departments of MDKG College, Dibrugarh are briefly as follows:

1. Assamese	5. English	9. Home Science	13. Sanskrit
2. Bengali	6. Geography	10. Mathematics	14. Sociology
3. Economics	7. Hindi	11. Philosophy	
4. Education	8. History	12. Political Science	

4. Methodology and computational procedure

The brief methodologies being used in the proposed study is demonstrated through below mentioned pictorial representation:

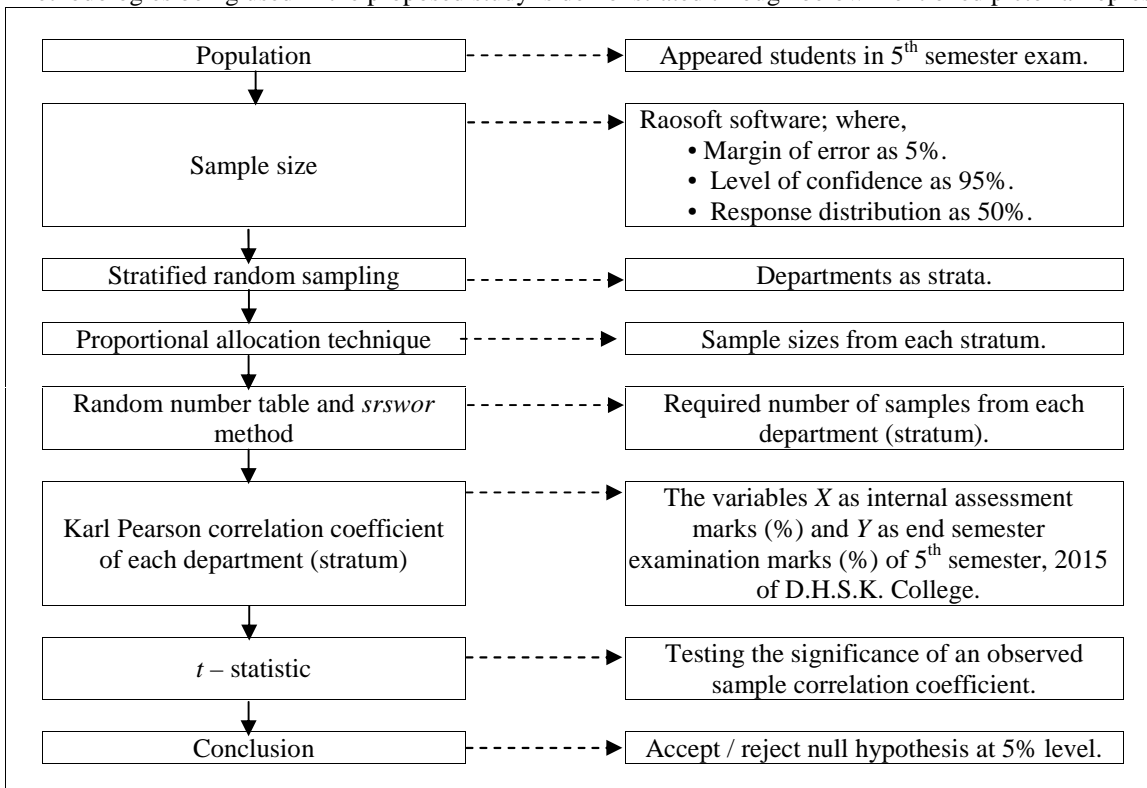




Table No. 2: Selection of samples by proportional allocation and srswor (Partial).

MDKG College:				
Departments (Stratum)	Stratum size N_i	Sample size (Proportional) $n_i = \frac{n}{N} N_i$; where, $N = 350, n = 183$	Random Selection	Arranging in ascending order
Assamese	54	28	38, 54, 15, 30, 36, 16,14, 02, 12, 07, 04, 05, 41 ,53, 35, 22, 32, 06, 51, 49, 19, 18, 50, 47, 42, 08, 13, 44.	02, 04, 05, 06, 07, 08,12, 13, 14, 15, 16, 18, 19, 22, 30, 32, 35, 36, 38, 41, 42, 44, 47, 49, 50, 51, 53, 54.

Following table gives the percentage of marks secured by the randomly selected students (using table no. 2) in their respective papers and of the respective departments, denoting Internal Assessment (IA) marks by X, End Semester Examination marks by Y. Also ‘*’ representing the absentees (considered as mark 0) in the examination.

Table No. 3: List of randomly selected students with their marks in the form % (Partial)

1. Assamese:															
Sl. No.	Rn. No.	Name	501			502			503			504			Result
			X	Y	T	X	Y	T	X	Y	T	X	Y	T	
1	2	A.K	85	56	62	95	51	60	100	48	58	85	50	57	PASS
28	54	U.K	85	50	57	95	56	64	100	46	57	85	50	56	PASS

2. Economics

Sl. No.	Rn. No.	Name	501			502			503			504			Result
			X	Y	T	X	Y	T	X	Y	T	X	Y	T	
1	1	A.D	90	59	65	85	63	67	90	68	72	100	50	60	PASS
15	29	T.A	80	51	57	80	25	36	80	50	56	95	28	41	FAIL

Following table gives the various sums, correlation coefficient and t statistics of various departments of both the stream as Science and Arts.

Table No. 4: Various sums, means and S.Ds. of the respective departments of MDKG College

Sl. No	Departments	n	\bar{X}	\bar{Y}	$\bar{X} - \bar{Y}$	\dagger_x	\dagger_y	\dagger_{xy}	Paired t test		
									$ t_{cal} $	t_{tab} at 5%	Decision
1	Assamese	112	92.2	58.2	34.0	7.2	9.9	17.2	30.95**	1.96	Reject H_0
2	Economics	60	87.6	54.0	33.6	8.0	12.7	17.1	18.82*	1.96	Reject H_0
3	Education	75	82.9	64.9	17.9	12.5	11.4	9.6	10.73*	1.96	Reject H_0
4	English	120	81.6	56.2	25.4	11.4	9.8	13.1	26.33**	1.96	Reject H_0
5	Geography	96	76.3	66.1	10.2	24.5	19.5	6.9	4.28	1.96	Reject H_0
6	History	40	75.8	46.2	29.6	9.3	14.1	15.2	11.67*	1.96	Reject H_0
7	Home Sc.	24	69.0	66.8	2.2	24.0	16.1	4.6	0.70	2.06	Accept H_0
8	Philosophy	52	94.5	49.0	45.5	5.5	10.1	22.9	29.42**	1.96	Reject H_0
9	Pol. Science	128	82.4	61.1	21.4	12.8	10.2	11.2	16.41*	1.96	Reject H_0
10	Sanskrit	08	70.0	65.6	4.4	6.1	16.1	4.0	0.96	2.31	Accept H_0
11	Sociology	84	77.1	61.5	15.6	9.8	8.5	8.4	12.71*	1.96	Reject H_0



Table No. 5: Various sums, means and S.Ds. of the respective departments of DHSK College (Arts stream)

Sl. No.	Departments	n	\bar{X}	\bar{Y}	$\bar{X} - \bar{Y}$	\dagger_x	\dagger_y	\dagger_{xy}	Paired t test		
									$ t_{cal} $	t_{tab} at 5%	Decision
1	Anthropology	12	67	66	1	12.5	24.1	19.2	0.09	2.2	Accept H_0
2	Assamese	68	74	55	19	17.9	13.6	18.5	10.6	1.96	Reject H_0
3	Economics	52	62	43	19	25.6	15.2	23.1	6.16	1.96	Reject H_0
4	English	188	54	43	11	22.5	14.7	19.8	7.8	1.96	Reject H_0
5	Geography	176	61	57	4	15.7	17	16.5	3.2	1.96	Reject H_0
6	History	16	60	47	13	8.9	5.7	9.9	4.12	2.13	Reject H_0
7	Philosophy	68	81	51	30	13.9	11.9	19.8	17.58	1.96	Reject H_0
8	Pol. Science	104	62	52	10	22.6	13.4	19.2	5.12	1.96	Reject H_0
9	Sanskrit	4	82	64	19	9.4	8.7	12.8	3.9	3.18	Reject H_0

Table No. 6: Correlation coefficient and its test of the respective departments of both Colleges

Sl. No.	Departments	MDKG College			DHSK College (Arts stream)		
		r	t-test for r	Decision	r	t-test for r	Decision
1	Anthropology	-	-	-	0.9	6.5	Reject H_0
2	Assamese	0.09	0.9	Accept H_0	0.6	6.1	Reject H_0
3	Economics	0.18	1.4	Accept H_0	0.6	5.3	Reject H_0
4	Education	0.29	2.6	Reject H_0	-	-	-
5	English	0.52	6.6	Reject H_0	0.6	10.2	Reject H_0
6	Geography	0.46	5.0	Reject H_0	0.4	5.7	Reject H_0
7	History	0.14	0.9	Accept H_0	-0.3	1.17	Accept H_0
8	Home Science	0.79	6.0	Reject H_0	-	-	-
9	Philosophy	0.05	0.4	Accept H_0	0.3	2.5	Reject H_0
10	Political Science	0.20	2.3	Reject H_0	0.4	4.4	Reject H_0
11	Sanskrit	0.77	3.0	Reject H_0	0.5	0.8	Accept H_0
12	Sociology	0.27	2.5	Reject H_0	-	-	-

Following graphs shows various results of MDKG College and DHSK College in our findings:

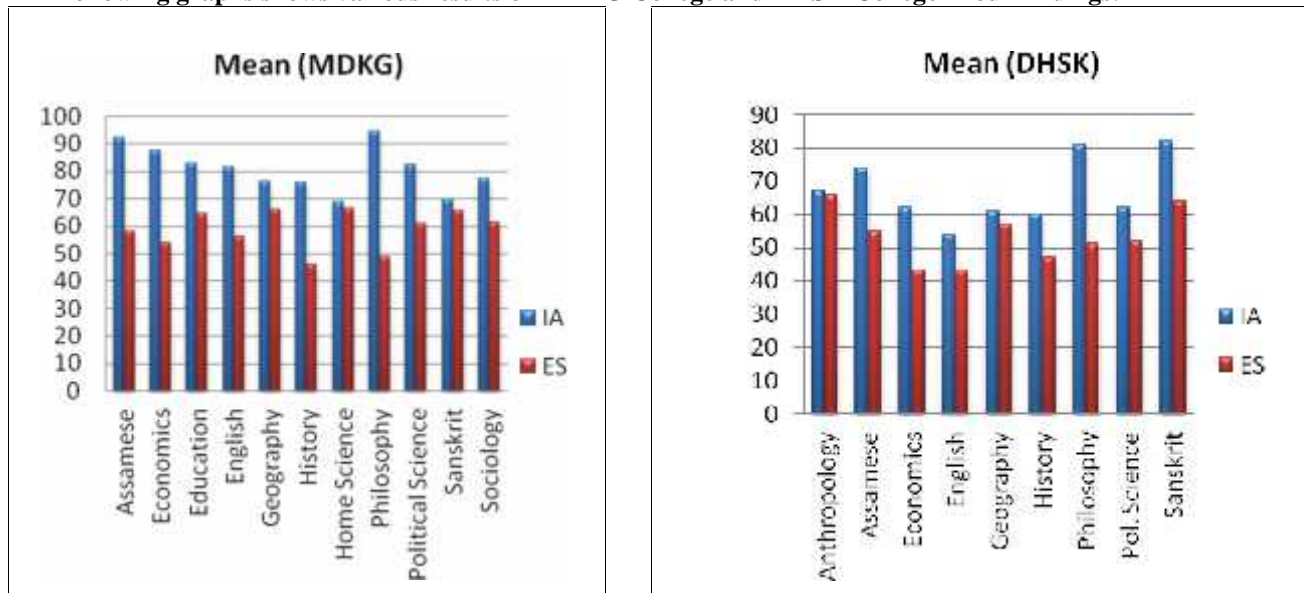


Fig. 1: Mean marks of IA and ES of various departments of MDKG and DHSK Colleges.

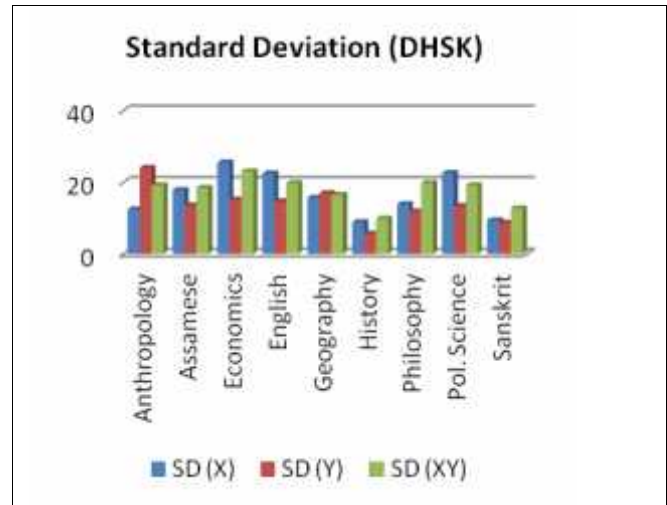
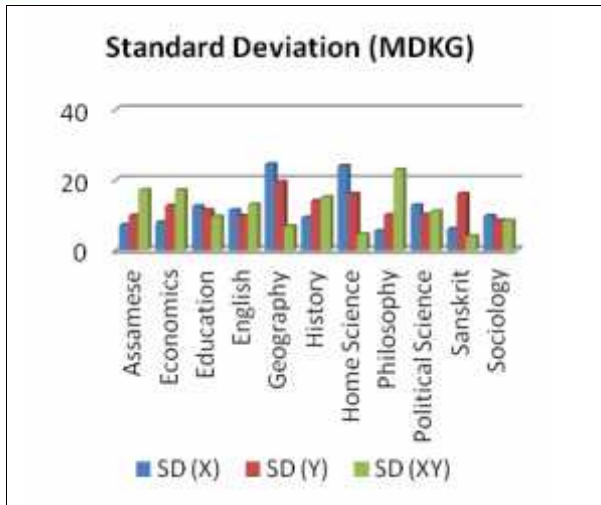


Fig. 2: Standard deviation of various departments of MDKG College and DHSK College.

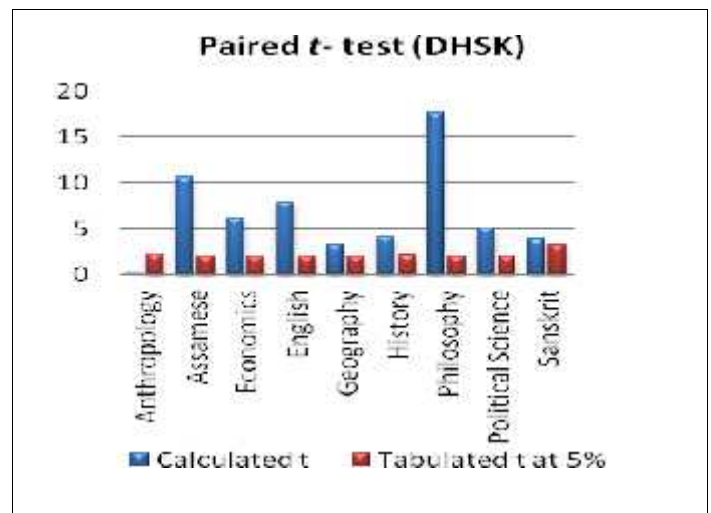
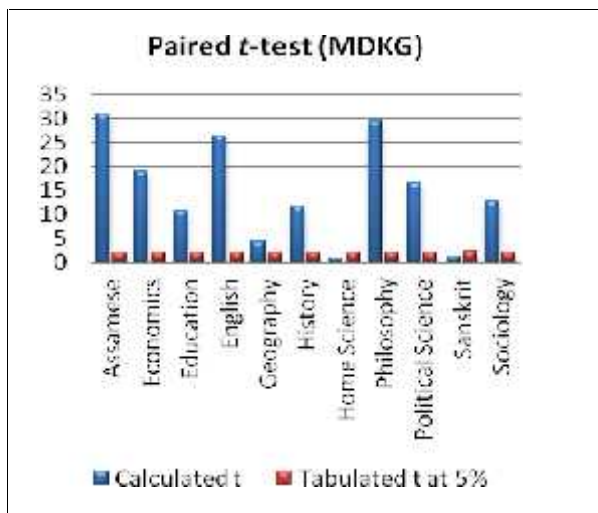


Fig. 3: Values of paired t of various departments of MDKG College and DHSK College.

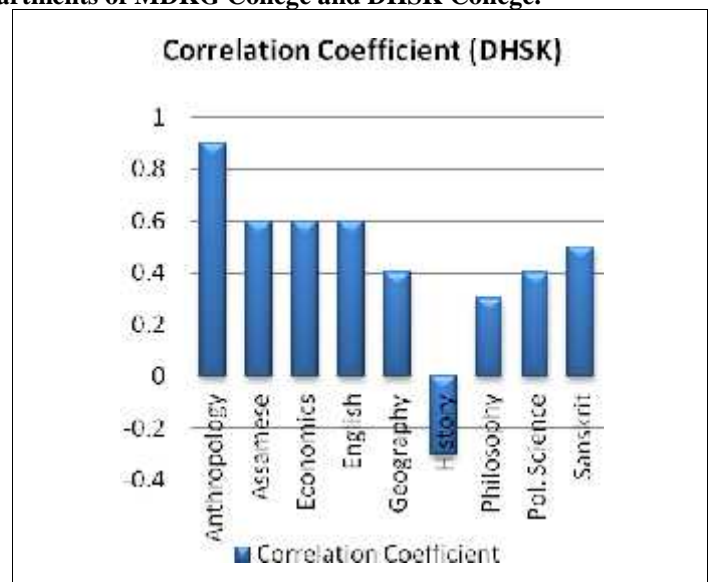
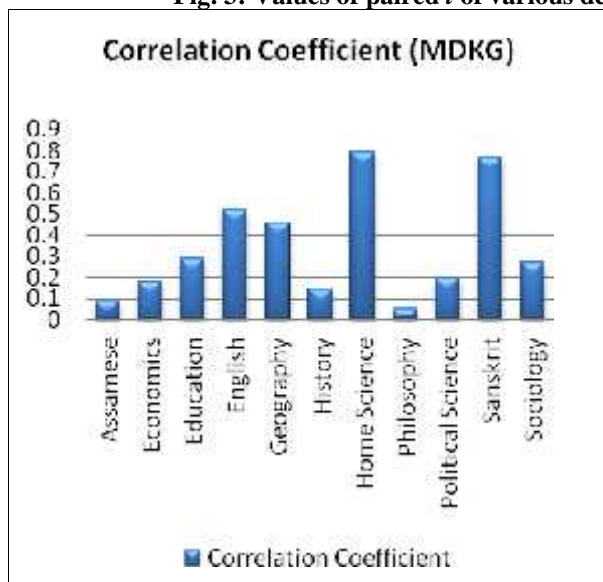


Fig. 4: Correlation coefficient of various departments of MDKG College and DHSK College.

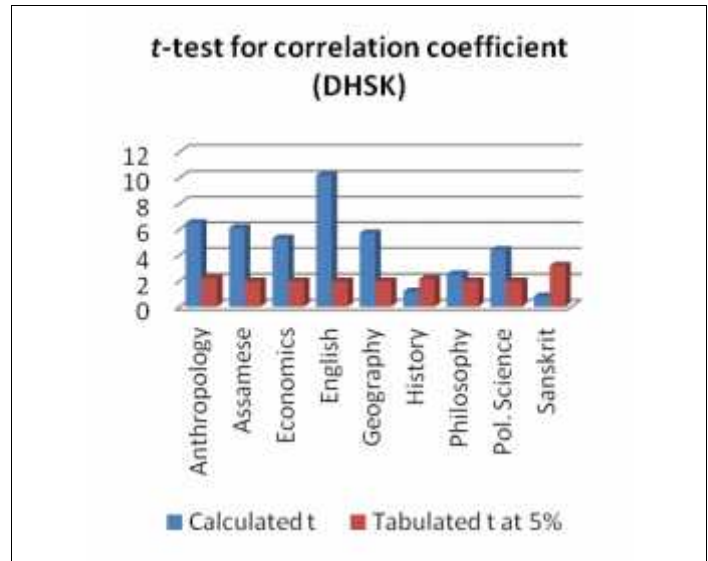
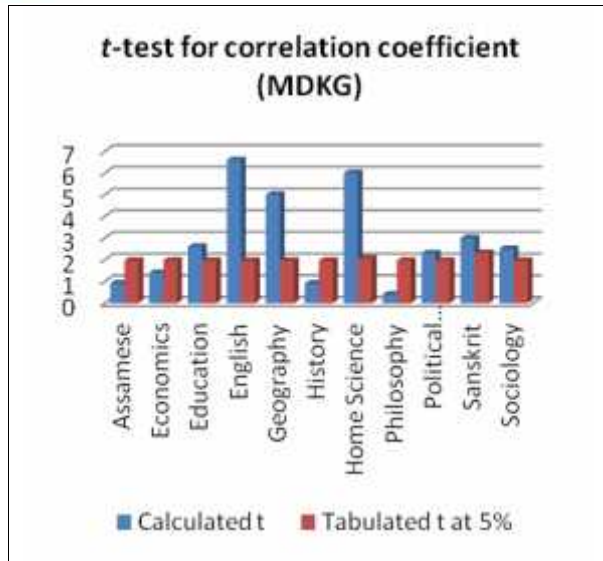


Fig. 5: Values of *t* of various departments of MDKG College and DHSK College.

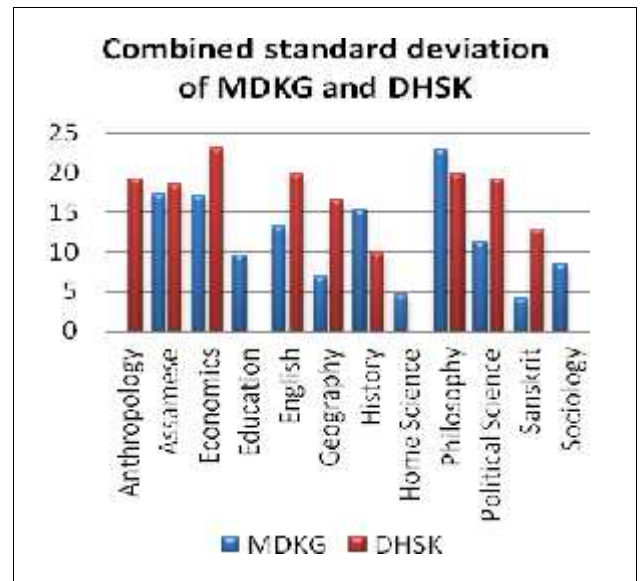
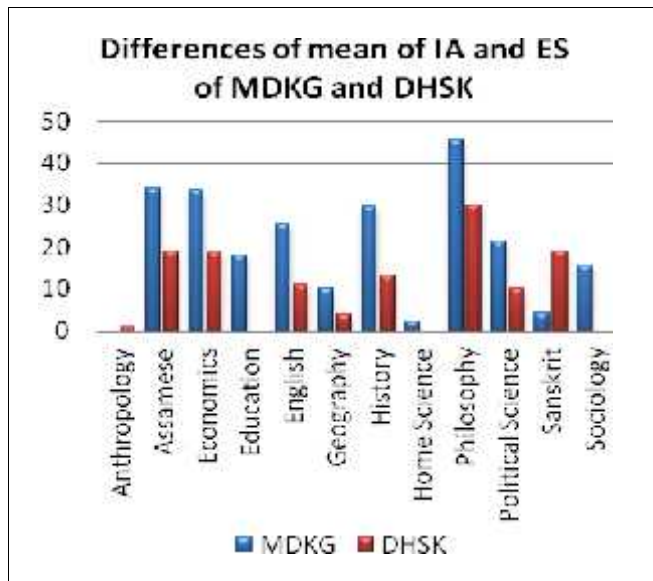


Fig. 6: Comparative diagram of differences of mean of IA and ES (i.e., $\bar{X} - \bar{Y}$) of both the colleges

Fig. 7: Comparative diagram of combined standard deviation of both the colleges

8. Conclusions

Brief comparative conclusions of within and between colleges are shown in the following table:

Table No. 7: Overall conclusion of within colleges

Measures	Criteria	MDKG College	DHSK College
Central Tendency	Departments having highest difference in IA and ES	Philosophy (46%)	Philosophy (30%)
	Departments having lowest difference in IA and ES	Home Science (2%)	Anthropology (1%)
Dispersion	Departments having highest variation in IA and ES	Philosophy (23%)	Economics (23%)
	Departments having lowest variation in IA and ES	Sanskrit (4%)	History (10%)
Correlation	Positive	All	Except History left all other.



Coefficient	Negative	Nil	History
Paired t test (at 5 % level)	Significant	Except Home Science left all other	Except Anthropology, left all other
	Not significant	Home Science	Anthropology
t- test for Correlation Coefficient (at 5 % level)	Significant	Education, English, History, Philosophy.	History, Sanskrit.
	Not significant	Assamese, Economics, History, Philosophy.	Anthro., Assamese, Eco., Eng., Geog., Phil., Pol. Sc.

Table No. 8: Overall conclusion of between colleges

Sl. No.	Departments	Correlation coefficient				Decision on Paired t-test	
		Strength and type of relationship		Decision on t-test		MDKG	DHSK
		MDKG	DHSK	MDKG	DHSK		
1	Anthropology	-	Very strong	-	Significant	-	Insignificant
2	Assamese	Very weak	Strong	Insignificant	Significant	Significant	Significant
3	Economics	Very weak	Strong	Insignificant	Significant	Significant	Significant
4	Education	Weak	-	Significant	-	Significant	-
5	English	Moderate	Strong	Significant	Significant	Significant	Significant
6	Geography	Moderate	Moderate	Significant	Significant	Significant	Significant
7	History	Very weak	Moderate	Insignificant	Insignificant	Significant	Significant
8	Home Sc.	Strong	-	Significant	-	Insignificant	-
9	Philosophy	Very weak	Moderate	Insignificant	Significant	Significant	Significant
10	Pol. Science	Weak	Moderate	Significant	Significant	Significant	Significant
11	Sanskrit	Strong	Moderate	Significant	Insignificant	Insignificant	Significant
12	Sociology	Weak	-	Significant	-	Significant	-

9. Suggestions

- Each department should take utmost care to minimise the differences of internal assessment and end-semester examinations marks.
- Setting of questions and evaluation of answer scripts in sessional examinations should be of same standard as compared to end-semester examinations questions papers.

10. Acknowledgement

I acknowledge with thanks the great service rendered by my student Miss Sahistha Amrin, a student of 6th semester, Department of Statistics, D.H.S.K. College, 2016, while entry of data in the form of tables, which was done in a very meticulous and systematic way.

References

1. Ahmed, N (2015): "Studying performances of students between In-semester and End-semester Examination: An empirical investigation", **CHIRANTAN CHINTAN**, Volume IV, No. 1, 162-173.
2. Internet (for calculating sample size): www.raosoft.com/sampleize.
3. Internet (for selecting random numbers): www.rand.org/publications/classics/randomdigits.