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Comparison of the States in India – An AISHE Data Analysis

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Abstract

The states in India are diverse in nature. The scenario of higher education across the states can be compared based on certain parameters like average enrolment per institution, number of Ph D enrolment, gender ratio, number of post-graduate enrolment, gross enrolment ratio, college population index, student teacher ratio, etc. this communication has described two methodology – rank sum and scoring methods of certainty for comparing the states. The data of AISHE for the period 2011-12 to 2017-18 have been taken as a case study.

Keywords: average enrolment per institution, gross enrolment ratio, college population index, student teacher ratio, AISHE.

Introduction: A study maps the continuing growth in world demand for higher education through 2040, and anticipates that there will be nearly 600 million students enrolled in universities around the world. According to Angel Calderon, the total number of students in higher education is expected to reach nearly 380 million by 2030, 472 million by 2035, and more than 594 million by 2040 – all up from roughly 216 million as of 2016. This pace of growth works out to an average of 4.2% every year. The world economy doubled in size between 1990 and 2016 and export in services from developing countries grew tenfold between 1990 and 2014 whilst growing at half the rate of service exports among advanced economies. The composition of that world enrolment by region is also shifting over time. There were just under 44 million students enrolled in Chinese universities in 2016, compared to 20 million in the US – the historical world leader in terms of overall student numbers.

There were about 715 million people aged 18-23 globally as of 2015. The UN projects that growth of this cohort will peak by 2030, after which it will continue to grow at a reduced rate. The world population of college-aged people is expected to reach 800 million by 2040. But an important related factor is that the college cohort has been decreasing for some time as a percentage of total world population. Those 18to23year-olds will represent 9% of the world's population in 2030, and 8.4% in 2040. This accounts for the downward-

curving trend lines. Indeed, as Mr Calderon points out, “74% of the expected growth for the population aged 18-23 from 2015 to 2035 will be concentrated in ten countries: Angola, Democratic Republic of the Congo, Egypt, Ethiopia, Kenya, Niger, Nigeria, Pakistan, Uganda, and Tanzania.”

A British Council report sets out the key trends that are shaping both higher education demand and international student mobility. “We are at a tipping point in the world higher education system. Students have more choices than ever,” says the British Council’s Director Education. “Beyond and behind traditional student recruitment lie drivers of change that are shifting the very nature of how we view and deliver higher education: they are indicative of a larger movement in the education sector, in line with an uncertain and rapidly changing future.”

These include some major shifts in demographics around the world. The British Council highlights in particular the influence of ageing populations in many regions. Simply put: greater life expectancy combined with lower fertility rates means that populations in many countries are getting older, and, in the process, the key 18 to 23 yearold collegeaged cohorts are shrinking.

The observation that is being made is that students and families appear to be placing more emphasis on value and, in particular, on the return on investment of an overseas education. At the same time, there are growing indications that major employers are placing less emphasis on educational brands – like greater openness to non-degree credentials, adopting so-called “blind” hiring processes that exclude school-specific information, etc. It is seen other indicators of this that points to a greater emphasis on subject-level rankings and career outcomes, and to the importance of unbranded search in the student decision-making process. It appears too in the price sensitivity exhibited by some students that, while drawn to elite brands or leading study destinations, are also clearly open to other choices. It is hard to imagine a future where English does not continue to play a major role in international mobility, but the authors leave room for this possibility as well: “As attention towards digital literacy increases, there is potential for English language literacy and programme to take a backseat as a new *lingua franca* emerges.”

Quality education is essential in the economic development of any nation. This fact is clearly evidenced from past experiences of countries/regions such as Singapore, Ireland, Korea, and the European Union during the last five decades. The Gulf Cooperation Council (GCC) member nations have also identified sound educational systems as being the cornerstone of economic progress, and taken several initiatives aimed at improving the quality (and quantity) of education over the last two decades.

Shortage of skilled teachers remains the biggest challenge for the education sector across the world, which is expected to pose a serious threat particularly for private school operators to maintain the quality of education provided by them. The enrolment rate in the higher education segment remains low in the other countries as compared to the developed nations, reflecting a mismatch between skills taught to graduates and requirements of the

labor market. This is likely to have an effect on the unemployment rate of the region. This communication is trying to state the trends in the enrolments for the states of India over the period of 7 years.

Data: All India Survey on Higher Education (AISHE) aims to cover all higher education institutions (HEIs) for all the states in India. The Survey collects data on enrolment, teachers, infrastructure of all kinds, etc. This communication covers the published data for the period 2011-12 to 2017-18. It covers the states - Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, West Bengal.

Result: A lot of performance indicators are measured to compare higher education level of a region. In this area, one may consider few like institutional density, college population index, gross enrolment ratio, etc.

In this communication, 23 states have been considered with the variables as Average enrolment per institution(X_1), number of Ph D students(X_2), number of post graduate enrolment(X_3), gender ratio(X_4), total enrolment(X_5), gross enrolment ratio(X_6), gender parity index(X_7), student teacher ratio in regular courses(X_8) and college population index (or number of students per 100000 individuals in the age group 18-23 years)(X_9). The data has been considered for 2011-12(read as 2011) to 2017-18(read as 2017).

Method-1

Define X_{ij} = the value for j th variable corresponding to i th state;

R_{ij} = the rank of j th variable corresponding to i th state

i =Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, West Bengal, and $j=1,2,3,\dots,9$.

Ranks are done as per the concepts of better to worse or worse to better as 1 to 23 for each variable.

Define S_i = sum of ranks corresponding to i th state. Therefore, lower the rank sum better is the state.

Table-1 : showing S-values for the years 2011 to 2017.

STATE	S(2011)	S(2012)	S(2013)	S(2014)	S(2015)	S(2016)	S(2017)
Andhra Pradesh	72	79	90	108	91	91	89
Assam	121	112	114	113	126	126	127
Bihar	163	169	170	169	177	177	181
Chhattisgarh	124	126	121	124	117	120	112
Delhi	87	94	93	78	92	94	97
Goa	98	82	74	85	81	89	96
Gujarat	121	130	132	131	125	135	129
Haryana	92	97	99	101	95	80	75
Himachal Pradesh	89	74	76	83	67	68	72

Jammu and Kashmir	125	101	105	97	101	101	110
Jharkhand	163	156	157	134	156	157	160
Karnataka	52	60	56	79	56	57	60
Kerala	59	57	60	65	49	53	55
Madhya Pradesh	106	123	127	128	126	121	128
Maharashtra	80	94	92	105	100	108	101
Odisha	126	128	130	131	139	142	139
Punjab	95	96	91	80	83	83	70
Rajasthan	111	123	120	122	114	102	104
Tamil Nadu	70	73	73	73	77	75	74
Tripura	163	155	150	153	167	163	159
Uttar Pradesh	134	114	115	111	123	121	120
Uttarakhand	84	92	91	90	80	73	79
West Bengal	149	149	148	124	142	148	147

Note : S(2011) means S-value for the 2011-12, etc..

It appears from the Table-1 that almost all the states are keeping their level almost fixed as of 2011-12 till 2017-18. There are few exceptions in the states- Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Rajasthan and Uttarakhand. In the states – Assam, Bihar, Madhya Pradesh and Maharashtra it is increasing and in the states – Haryana, Rajasthan and Uttarakhand it is decreasing.

Method-2

Let M_j be the median for j th variable and s_j be the standard deviation of j th variable.

Define score as $S_{ij} = 1$ if X_{ij} lies within $(M_j - s_j, M_j + s_j)$ and $= 0$ otherwise.

Thus, $S1_i =$ sum of scores corresponding to i th state. It is evident that more the sum of score better is the state.

Table-2 : showing median, sd and interval for each variable and years

Year	Measure	X1	X2	X3	X4	X5	X6	X7	X8	X9
2011	Median	730	2368	75533	72.80	594079	21.8	0.92	21	25
	sd	734.93	220.85	86287.93	13.44	437905.11	9.47	0.13	14.74	22.50
	Interval	-4.93	2147.15	-10754.93	59.36	156173.89	12.33	0.79	6.26	2.50
		1464.93	2588.85	161820.93	86.24	1031984.11	31.27	1.05	35.74	47.50
2012	Median	730	2547	83708	46.01	603232	22.1	0.85	20	26
	sd	796.70	122.77	80040.53	5.08	433387.29	8.00	0.17	18.72	19.86
	Interval	-66.70	2424.23	3667.47	40.93	169844.71	14.10	0.68	1.28	6.14
		1526.70	2669.77	163748.53	51.09	1036619.29	30.10	1.02	38.72	45.86
2013	Median	681.5	3036.5	95380.5	46.67	751948	25.15	0.905	19.5	28.5
	sd	802.70	645.19	86477.51	4.41	442537.32	9.57	0.08	20.22	20.03
	Interval	-121.20	2391.31	8902.99	42.26	309410.68	15.58	0.82	-0.72	8.47
		1484.20	3681.69	181858.01	51.08	1194485.32	34.72	0.99	39.72	48.53
2014	Median	32	3417	117626	47.11	867328.5	25.7	0.93	20	30

	sd	19.40	800.91	83306.60	3.94	587313.54	9.74	0.08	17.21	20.03
	Interval	12.60	2616.09	34319.40	43.18	280014.96	15.96	0.85	2.79	9.97
		51.40	4217.91	200932.60	51.05	1454642.04	35.44	1.01	37.21	50.03
2015	Median	638.5	3463.5	112376.5	47.53	923583	25.45	0.925	20	30
	sd	852.12	668.60	85031.94	3.35	597186.30	9.23	0.07	19.30	20.03
	Interval	-213.62	2794.90	27344.56	44.18	326396.70	16.22	0.86	0.70	9.97
		1490.62	4132.10	197408.44	50.89	1520769.30	34.68	0.99	39.30	50.03
2016	Median	587	3646.5	124008.5	47.99	986100	26.05	0.96	23.5	30.5
	sd	677.79	1472.97	87827.09	4.00	561231.77	9.69	0.08	26.27	21.73
	Interval	-90.79	2173.53	36181.41	43.99	424868.23	16.36	0.88	-2.77	8.77
		1264.79	5119.47	211835.59	52.00	1547331.77	35.74	1.04	49.77	52.23
2017	Median	643	4116.5	121400	48.67421	1051250	27.75	0.985	23.5	30
	sd	599.66	1562.41	57740.30	3.77	515150.84	9.21	0.10	26.27	21.93
	Interval	43.34	2554.09	63659.70	44.90	536099.16	18.54	0.88	-2.77	8.07
		1242.66	5678.91	179140.30	52.44	1566400.84	36.96	1.09	49.77	51.93

Table -3 : showing S1-values for the years 2011 to 2017

STATE	S1(2011)	S1(2012)	S1(2013)	S1(2014)	S1(2015)	S1(2016)	S1(2017)
Andhra Pradesh	5	6	5	5	5	6	5
Assam	9	8	9	8	7	9	8
Bihar	5	3	2	2	2	3	3
Chhattisgarh	6	7	7	7	7	7	7
Delhi	7	7	6	5	4	4	5
Goa	5	5	4	5	4	5	5
Gujarat	8	8	6	7	6	8	7
Haryana	9	8	9	8	8	8	6
Himachal Pradesh	7	8	7	4	5	3	3
Jammu and Kashmir	7	6	7	7	5	5	7
Jharkhand	4	5	4	4	4	5	4
Karnataka	5	6	6	6	6	5	6
Kerala	6	6	6	7	6	6	6
Madhya Pradesh	6	5	5	5	6	8	7
Maharashtra	5	6	6	5	4	6	5
Odisha	8	8	8	7	7	9	8
Punjab	8	7	7	8	7	7	7
Rajasthan	7	6	7	5	6	7	6
Tamil Nadu	4	5	5	5	5	5	5

Tripura	5	5	4	4	4	6	4
Uttar Pradesh	7	7	7	7	8	7	8
Uttarakhand	5	5	5	6	6	6	6
West Bengal	6	7	5	5	5	6	5

Note : S1(2011) means S1-value for the 2011-12, etc..

It appears from the Table-3 that almost all the states are performing within expectations except two states- Delhi and Himachal Pradesh. In the both the cases, the situation is going a little down as expected.

Conclusion: In comparing the states in India and with 9 variables has been done. The variable were in different scales and are not exhaustive for HEIs of any state. Two methods have been stated for comparing the states in India based on a set of 9 different variables. There are other methods of comparison also. The methods are non-parametric and scale independent also. Thus, the comparison can be made using any of the methods. The purpose of selecting better state among the states in India can also be obtained taking any year score or sum of ranks and then ranks the states arranging the scores or sum of ranks in descending or ascending order respectively.

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