



Dynamics of Social Systems

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ABSTRACT

When you study parameters of a social system it is seen that they have a normal distribution. It is hence natural to ask: "What happens if this normal distribution is disturbed?" Such is the case when meritorious students are admitted to engineering colleges. Study was conducted and it was seen that as they pass through the college the normal distribution is re-established for the marks they obtain in the successive examinations. This result gives conclusive evidence that the normal distribution will be established. This understanding could be used very effectively in the formulation of academic and administrative policies.

1. Introduction:

From the very dawn of history human effort was directed at improving the existing structure and nature of society. Social reformers always developed theories and attempted to improve upon the existing society. But all these theories are devoid of an attempt to study the limitations and the extent to which such changes are possible. This aspect becomes all the more important when we see that most reformers and Governments attempt at total eradication of some nature of the society. One such is the effort of the governments to establish an egalitarian society.

Hence it was important that a study of this nature is conducted. The distribution of the chest measurements given in the study [Galton, 1870] shows a normal distribution. The next one is the study of the heights of American soldiers of the year 1966 [Damon, 1966]. These two studies are separated by almost a century and still they both are normal distributions.

This suggests that such distribution exist and there is no validity in saying all men are born equal. Definitely inequality exists and there is a normal distribution for it too and it can be taken as a nature of the social systems. That means that a sustainable system in the natural state always had a normal distribution for parameters we choose to analyses.

To establish this theory study had to be conducted to see what happens if the normal distribution is disturbed. If you consider the marks of the students admitted to the first year of Engineering College the distribution is only in the higher ranges of marks. Then an analysis was conducted with the results of the first year.

Two studies were conducted. For the first batch the study was conducted with the results of the first year. Encouraged by the results of the first case for the second batch the study was conducted taking into consideration the result of the first and second year. The study is detailed in the next section.

2. Case study 1:

All the students of the first batch when admitted had a percentage more than 60%. The expected and actual results of this batch in the first year are given in Table 1.

Table 1. Distribution of Marks – expectations and actual.

Range of Marks	Distribution of Marks			
	Entry level	I BE		
		Distribution I	Distribution II	Distribution III
31-40				1
41-50				11
51-60		11		20
61-70	11	36		24
71-80	36	18	11	9
81-90	18		36	
91-100			18	

The first column in Table 1 gives the range of marks. The second column has the distribution of the marks of the students at the entry level. The third column gives the expected result if their performance was poor and the fourth column gives the expected result if they performed better. The fifth column gives the actual result. This actual result showed that there is an in-built mechanism by which the sub-system of students is trying to regain the normal distribution. This prompted us to see what happened to students in each range of marks. The analysis is given in Table 2.

Table 2. Distribution of Marks of the first batch.

Range of Marks	Distribution of Marks				
	Entry level	I BE for each range of entry level			
		61-70	71-80	81-90	Total
21-30			1		1
31-40		5	5	1	11

Range of Marks	Distribution of Marks				
	Entry level	I BE for each range of entry level			
		61-70	71-80	81-90	Total
41-50		3	15	2	20
51-60		3	14	7	24
61-70	11		1	8	9
71-80	36				
81-90	18				

Range of marks is given in the first column in Table. 2. The second column gives the distribution of marks at the entry level which is the 10+2 marks. Columns three to five give the distribution of marks of first year engineering results of students in each range at entry level. The sixth column gives the distribution of all the sixty-six students taken together.

From the distribution of marks in columns 3 to 5 it is seen that the randomness is being brought back into the system. It is not that the students lowered in their performance by one or two slots but students in each range of mark distributed themselves into quite a few ranges. This clearly shows that by second year the system is approaching the normal distribution

3 Case Study 2:

Encouraged by the results study was conducted by analyzing the results of the first and second year The results are given in Table 3.

Table 3. Distribution of Marks of the second batch.

Range of Marks	Distribution of marks										
	I & II BE for each range of entry level								Total		
	51-60		61-70		71-80		81-90		EL	I	II
	I	II	I	II	I	II	I	II			
0-1		1			1	1		1		1	3
11-20				1		6		1			8
21-30	1			7	1	4				2	11
31-40		1	5	6	7	5	1	2		13	14
41-50	3	1	6	1	15	19	4	4		28	25
51-60		1	6	2	17	8	7	6	4	30	17
61-70					2		7	3	17	9	3
71-80								2	43		2
									19		
Total	4		17		43		19		83		

The study clearly shows that by second year the system is approaching the normal distribution. What is more interesting is to note that even students of the 81-90 range at admission level also distributes themselves into all the ranges of marks. This observation was quite revealing. This clearly brings out the fact that for a system to be in its natural state the normal distribution has to be established. Hence a system to be maintained at a non-natural state extraneous effort will be required.

4. Case study 3:

Table 4. Distribution of marks of the third batch

<i>Range of Marks</i>	<i>Distribution of Marks</i>				
	<i>Entry level</i>	<i>BE marks for each range of entry level</i>			
		<i>61-70</i>	<i>71-80</i>	<i>81-90</i>	<i>Total</i>
<i>41-50</i>			2		2
<i>51-60</i>			9	2	11
<i>61-70</i>		5	19	10	34
<i>71-80</i>	9	3	14	12	29
<i>81-90</i>	52	1	7	11	19
<i>91-100</i>	39		1	4	5
<i>Total</i>	<i>100</i>	9	52	39	<i>100</i>

The batch for the case study 3 was actually 914. The distribution was found out and then reduced to strength of 100 students so that it is easier to compare. The results are given in Table 4. The mark used here is that of the passing out level. It can again be seen that the normal distribution is attained.

5. Conclusions:

This shows clearly that a social system of people while interacting will reestablish the normal distribution in any quality we choose to analyse. So, unless a student is careful it is easy for him to be pushed down to lower levels in his performance. Teachers also have to know clearly understand what improvement they can really achieve. Because whatever the teacher may do the normal distribution is going to be established.

In a general case it implies that the equalitarian society which is set as the aim of the socialistic approach is an impossible goal. What is feasible is to make everyone skilled in their own profession. What it means is that the carpenter should become a furniture designer. An agriculture laborers should become a knowledgeable farmer.

For the current educational system all the students get equal opportunity to listen to the teacher. But when the result comes, they fall into a distribution. This happens because the time given is same for everyone and the less intelligent is not able to cope with the intelligent student. So, if you want everyone to reach the top level in marks then the students should be given more time.

What it means is that we now insist that the student should get 100% in the first lesson to go to the second lesson. So finally, we will see that the time taken will have a standard distribution.

6. Implications:

This study can be used effectively in formulating policies. For instance, if you keep two brilliant persons to work together due to the inherent mechanism of the system it will lower the performance of one of the persons and improve the other. If the person performing poorly is now changed to another group, he may be able to regain his performance.

The major outcome of this study is to understand that the egalitarian society will never be established. Hence all effort to do that should be re-oriented towards possible outcomes. First step in this direction would be to stop common education up to 10+2 level. After the very basic level up to primary school the curriculum should adapt to the choice and aptitude of the student. He should be able to choose a course even as wider as physical labour and skills required for that. What should be done is to reduce the physical effort required by developing such implements.

This means that the government has to consider both individual preference and the need of the local village. Effort should be to develop courses by which the growth of the student is taken care of and also the skills to make the village self sufficient are also introduced.

7. Generalization:

If you look at a human society which exist naturally it will consist of men and women of all ages. As in the case of a family it will consist of the grandparents, parents, and the children of both sexes. Such a family will have the least psychological problems and will continue without any problem.

Now if you consider the modern society, the students of the same age stay in a hostel. This is a highly ordered system. The system trying to come back to the randomness will cause some of them to behave like grandparents, some of them like small kids and some of them like girls leading to unnatural sex behavior. When this is restricted, it can lead to rebellious behavior from the group.

Properly developed this study will help in understanding many of the social problems.

8. References:

1. Galton F Hereditary Genius: An Enquiry into its Laws. Horizon Press. (1952)
2. Damon A et al.: The Human Body in Equipment Design. Hraward University Press (1966)