



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2016; 2(1): 703-708
www.allresearchjournal.com
Received: 13-11-2015
Accepted: 15-12-2015

Hariharan R

Assistant Professor in
Education Dr. Sivanthi
Aditanar College of Education
Tiruchendur Tamil Nadu,
India.

Analysing the deficiencies in teacher education by Pareto chart

Hariharan R

Abstract

Vilfredo Federico Damaso Pareto (1848 –1923) (Wilfred *Fritz Pareto*-Italian) was an Italian engineer, sociologist, economist, political scientist, and philosopher. He made several important contributions to economics, particularly in the study of income distribution and in the analysis of individuals' choices. He was also responsible for popularising the use of the term "elite" in social analysis. He introduced the concept of Pareto efficiency and helped develop the field of microeconomics. He was also the first to discover that income follows a Pareto distribution, which is a power law probability distribution. The Pareto principle was named after him and built on observations of his such as that 80% of the land in Italy was owned by 20% of the population. He also contributed to the fields of sociology and mathematics.

Keywords: Analysis, Deficiencies, Teacher Education, Pareto Chart

1. Introduction

A Pareto chart, named after Vilfredo Pareto, is a type of chart that contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line.

The left vertical axis is the frequency of occurrence, but it can alternatively represent cost or another important unit of measure. The right vertical axis is the cumulative percentage of the total number of occurrences, total cost, or total of the particular unit of measure. Because the reasons are in decreasing order, the cumulative function is a concave function. To take the example above, in order to lower the amount of late arrivals by 78%, it is sufficient to solve the first three issues.

The purpose of the Pareto chart is to highlight the most important among a (typically large) set of factors. In quality control, it often represents the most common sources of defects, the highest occurring type of defect, or the most frequent reasons for customer complaints, and so on. Wilkinson (2006) devised an algorithm for producing statistically based acceptance limits (similar to confidence intervals) for each bar in the Pareto chart.

These charts can be generated by simple spreadsheet programs, such as OpenOffice.org Calc and Microsoft Excel and specialized statistical software tools as well as online quality charts generators.

80/20 Rule

The Pareto chart is one of the seven basic tools of quality control based on six sigma process. This technique is used for academic decision making based on the Pareto Principle, known as the 80/20 rule. This decision-making technique statistically separates a limited number of input factors as having the greatest impact on an outcome, either desirable or undesirable.

Pareto analysis is based on the idea that 80% of a project's benefit can be achieved by doing 20% of the work or conversely 80% of problems are traced to 20% of the causes. Pareto chart combines a column chart and a line graph. The Pareto principle states that, for many events, roughly 80% of the effects come from 20% of the causes. E.g.

- 80% of an academic complaints come from 20% of its students, teachers and parents etc.
- 80% of an academic work come from 20% of the time spend
- 80% of an academic quality come from 20% of its students, teachers and administrators

Correspondence

Hariharan R

Assistant Professor in
Education Dr. Sivanthi
Aditanar College of Education
Tiruchendur Tamil Nadu,
India.

- 80% of an academic problems come from 20% of its substandard institutional practices.
- 80% of an academic growth come from 20% of its teachers, students and parents.

Using Pareto chart

The various academic priorities are noted and the complaints received are calculated against the each complaint over a period of time may be in an academic year. The different categories of various academic problems or issues are collected through the brain storming sessions conducted by various academic experts or by administrators. The voice of the customers (VOC) are noted for improving the overall academic quality of the institution. The relative frequency of the each problems are noted for evaluating its influence on quality outcome of the academic process.

The steps

1. Recording the raw data of various institutional problems

The data can be collected through the brain storming sessions conducted for the students, teachers, parents and various stake holders. The validity as well as the reliability of the data can be statistically analyzed. The data pertaining to institutional process can be noted in the M.S excel sheet or in the related software systems so as to performing calculations of the Pareto chart.

2. Ordering the data

The data can be ordered schematically by sorting it from the highest to the lowest along with the particular variables selected.

3. Finding cumulative counts

The cumulative count is calculated after the data entry is done in the excel sheet. The complaints cumulatively added as in the case study. (See case study – 2)

4. Finding cumulative percentage

For calculating the cumulative percentage, the cumulative count of the individual variable [e.g. for lack of leadership quality 35 is the no of complaints and cumulative count is 140 and the cumulative frequency is 62.22 (140/225 * 100)] must be divided by the total cumulative count and then multiplied by 100.

5. Label the left hand vertical axis

This can be done in the M.S excel sheet by choosing the clustered bar diagram of the column.

6. Label the right hand horizontal axis

This is also done in the M.S excel sheet by choosing the clustered bar diagram of the column.

7. Plotting bar for each category

This process can be performed after selecting the variables along with cumulative count and cumulative percentage simultaneously in the excel sheet.

8. Drawing cumulative line

The excel sheet the insert icon must be clicked to select the line with markers to draw the cumulative line of the Pareto chart

Prerequisites

- Trained personnel to examine various academic process, events etc.
- Academic efforts of the individuals focused on the most frequent causes
- Analysis of performance indicator results over a fixed time interval.
- Special team combined of key users of the educational process or experienced personnel related to methods and techniques used in the selected academic practices.
- Availability of data pertaining to the academic quality principles, methods and performance levels in various process.



Benefits of the Pareto chart

- The major advantage of Pareto Diagram is to analyse the most important faults, and the main disadvantage is the hierarchical system of the faults, of non-conformities that frequently depend on the academic process that makes it.
- Further, it solves a problem efficiently by the identification of its hierarchical order and it solves the problem according to its importance of the main causes.
- It sets the priorities for many practical applications. Some examples are: process improvement efforts for increased academic readiness, academic needs, stake holders, guidelines of nodal agencies of the state etc. It shows where to focus efforts on overall academic quality by allowing better use of limited resources.

Complaints in teacher educative process	No of complaints	cumulative count	Cumulative %
Lack of resource facility	60	60	26.66
Lack of fund distribution	40	100	44.44
Lack of leadership quality	35	135	60
Lack of dynamic ability in moulding the students	30	165	73.33
Lack of skill training	25	190	84.44
Reluctance for continuous evaluation	20	210	93.33
Inadequate disciplined practices	15	225	100
Total	225		

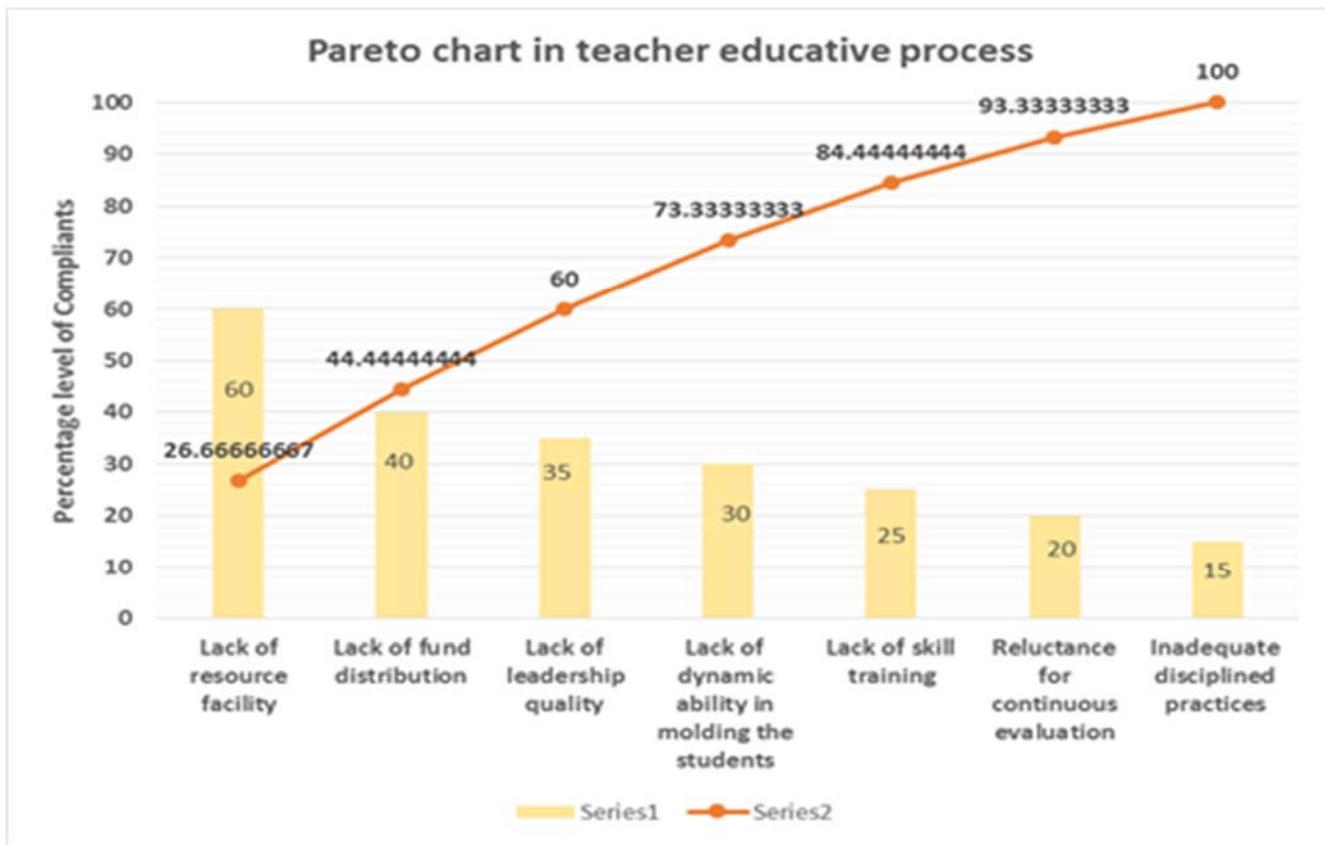


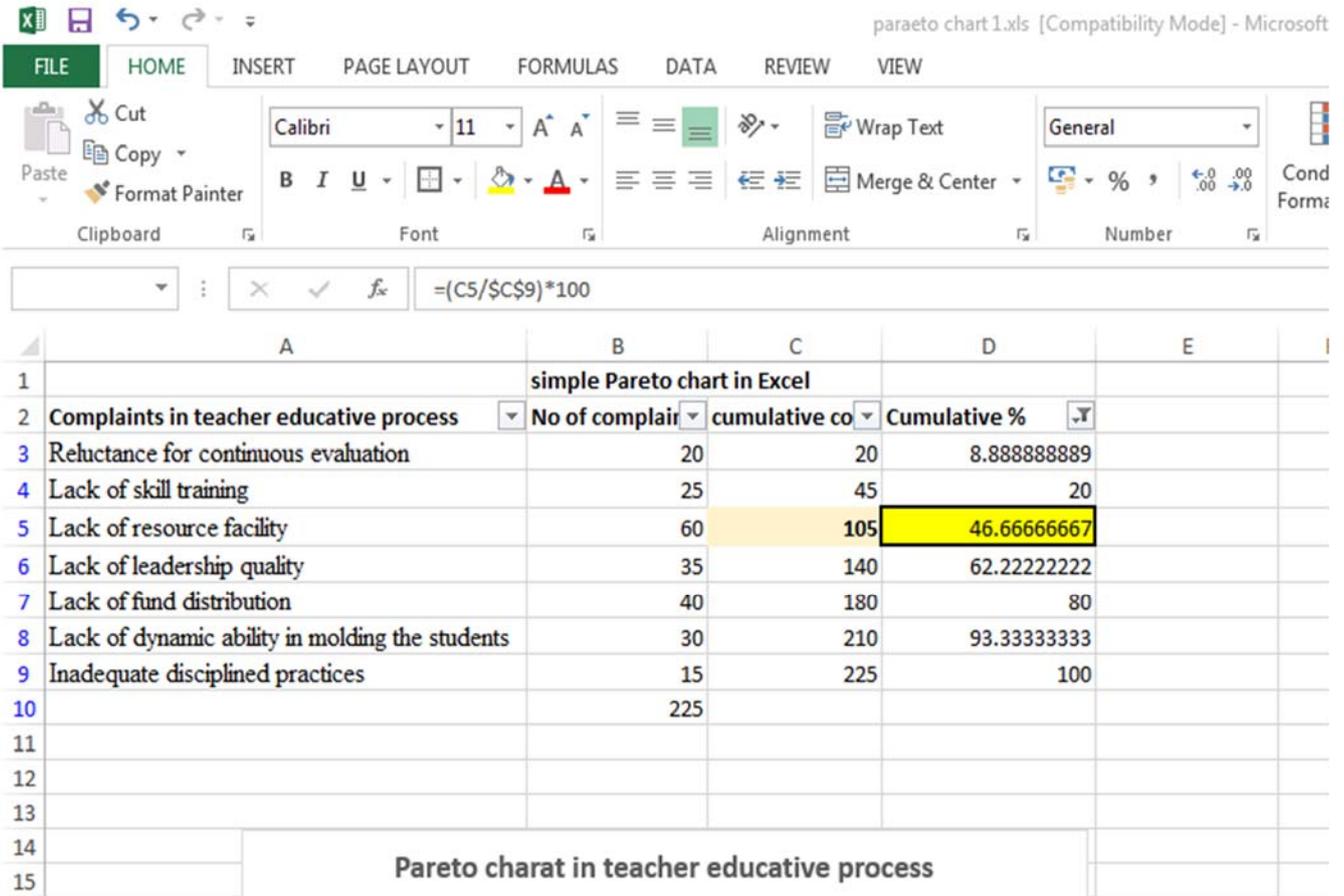
Fig: showing the Pareto chart of teacher educative program

Step: 1 – Data entry process of teacher educative process. The data related with the failures or compliants are noted in the Excel sheet with the title headings.

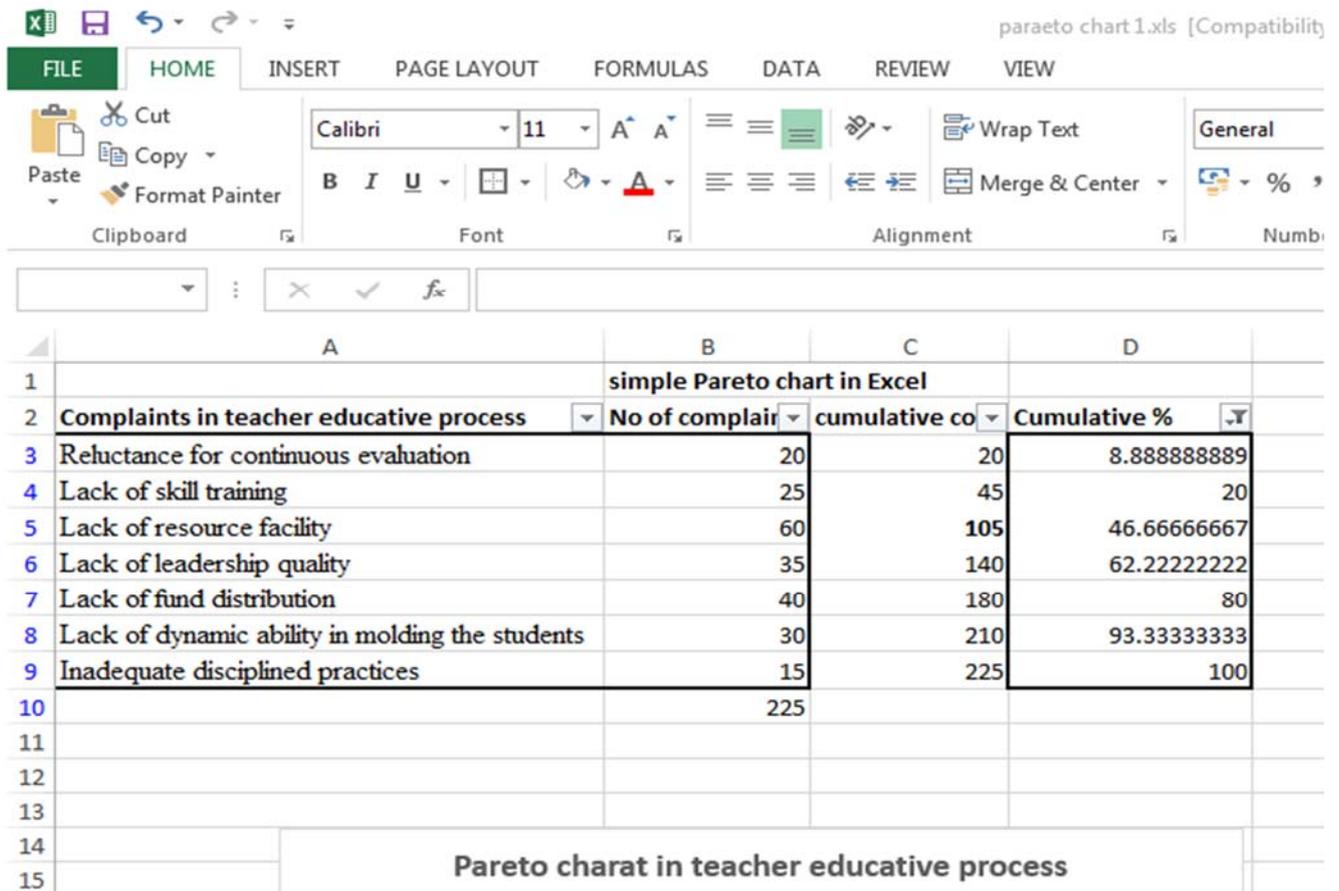
Step: 2 – The cumulative count is counted from the compliants received. The calculative step (C3+B4) is followed for the entire variables examined (See the figure)

Complaints in teacher educative process	No of complair	cumulative co	Cumulative %
Reluctance for continuous evaluation	20	20	8.888888889
Lack of skill training	25	45	20
Lack of resource facility	60	105	46.66666667
Lack of leadership quality	35	140	62.22222222
Lack of fund distribution	40	180	80
Lack of dynamic ability in molding the students	30	210	93.33333333
Inadequate disciplined practices	15	225	100
	225		

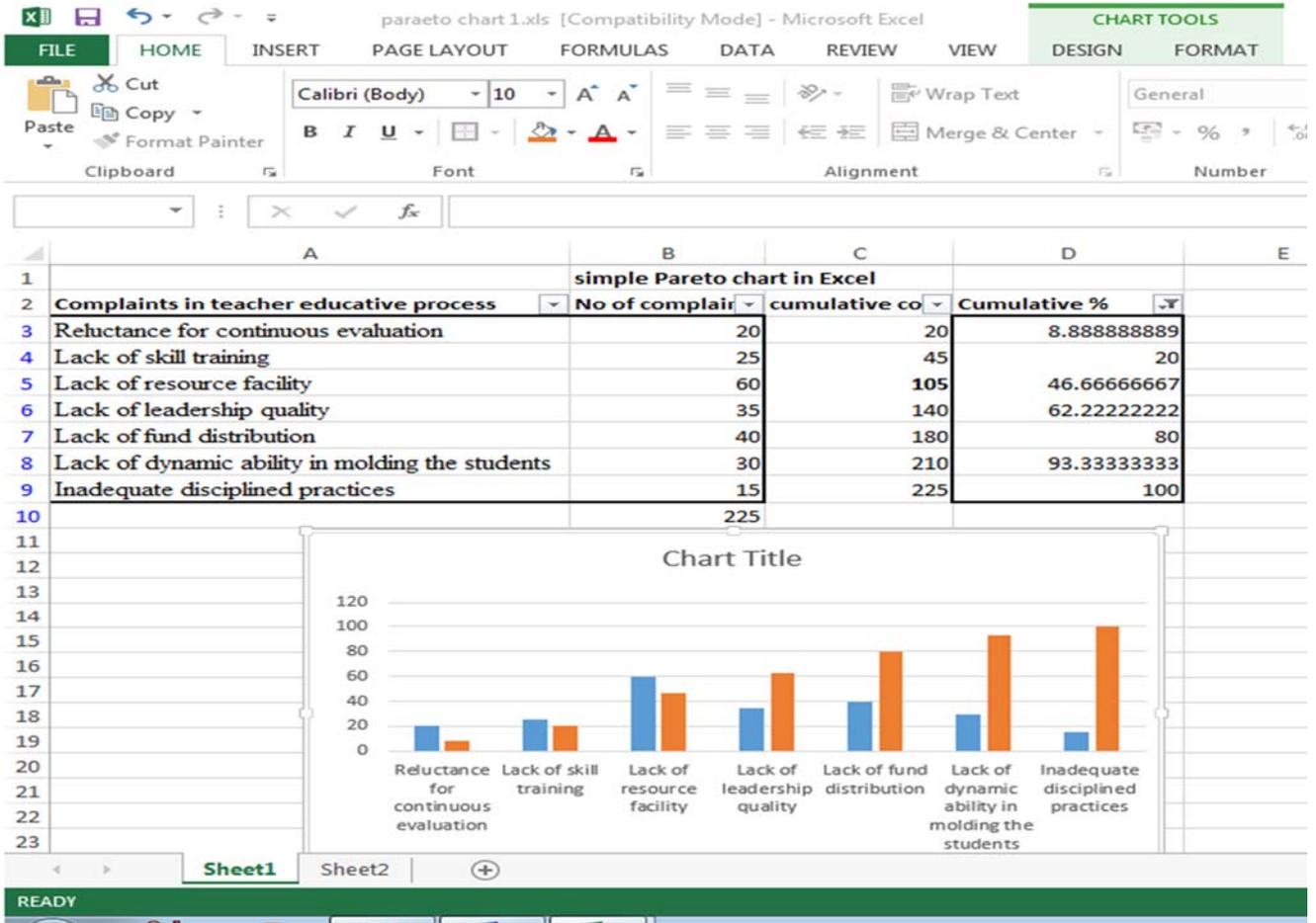
Step: 2 – The cumulative percentage is calculated from the cumulative count. The calculative step [= C3/\$C\$9]*100] is followed for the entire variables examined (See the figure)



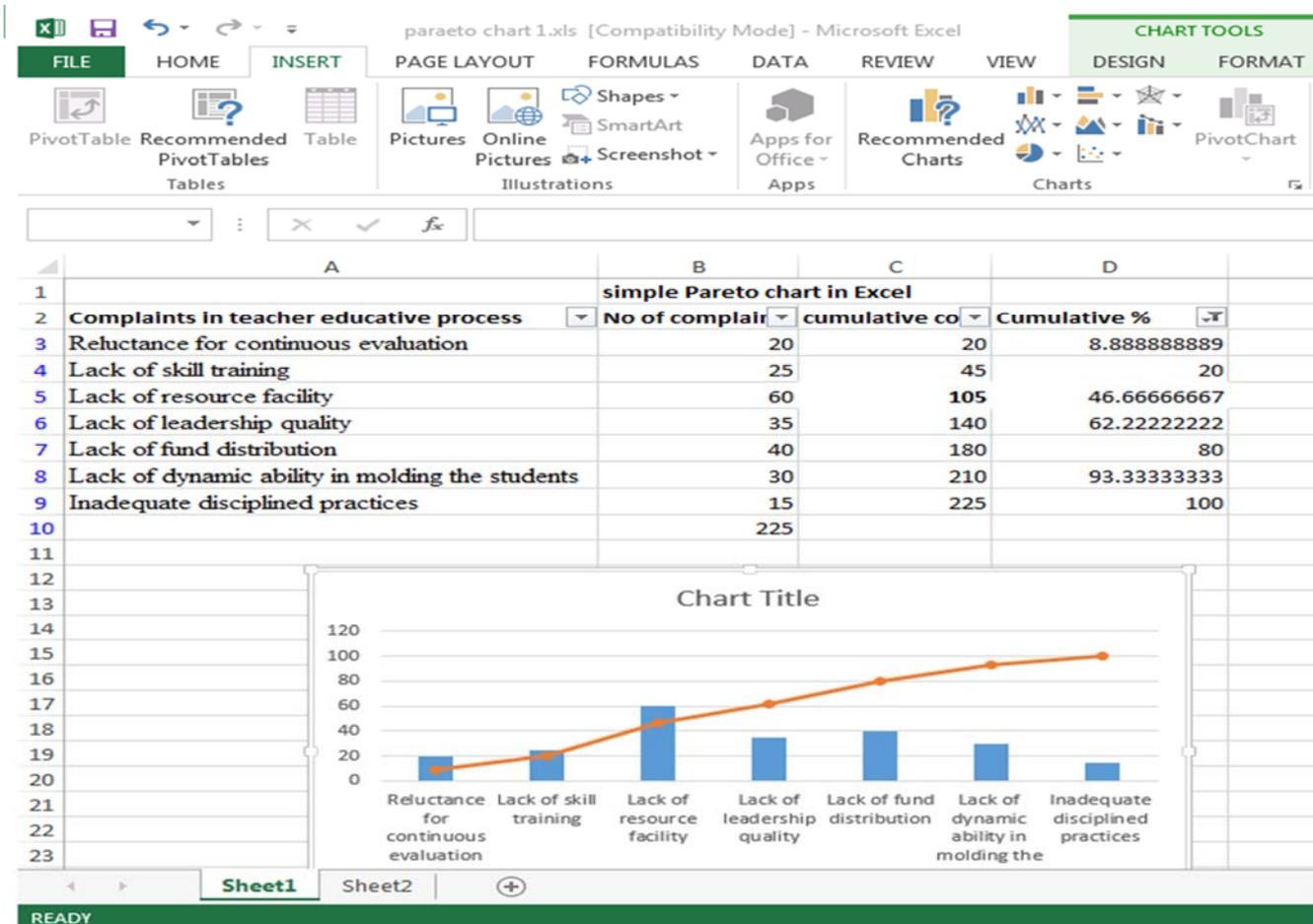
Step: 3 – column A, B and C is selected for the bar chart. (select 2 dimensional in charting area)



Step 4 – In the cumulative bar of the chart, select the line with markers.



Step 5 – The plot with line markers make the Pareto chart.



Final chart shows the Pareto chart which represent the 80 – 20 rule. The lack of fund distribution makes the 80 % of the problem in teacher education.

Conclusion

The use of the Pareto chart has been validated in the industrial units which stringently use the quality perspectives of the product. Similarly it can be ascertained from this paper that the quality constraints which are hindering the academic process can be effectively identified and eliminated so as to sustain the academic quality and its vigour.

References

1. Brue G. Six Sigma for managers, Delhi, Tata McGraw hill, Fourth edition, 2003.
2. Hariharan R, Mohanasundaram K. Impact of Six Sigma–DMAIC Approach in Learning the ICT Concept by the Prospective Teachers. Book of abstracts of the Association for Teacher Education in Europe Spring Conference 2013: Teacher of the 21st Century: International conference Quality Education for Quality Teaching, Riga, Latvia. May 2013; 31:10-11, Available at <http://www.ppf.lu.lv/pn/index.php?id=sessions>
3. Hariharan R, Zascerinska J, Swamydhas P. A Comparative Study of Methodologies of Teaching Web Technologies to Prospective Teachers in India and Latvia. International Journal on Modern Education Forum. (IJMEF). Accessible from www.ijmef.org, 2013.
4. Hariharan R, Mohanasundaram K. Quality analysis of teacher educative process by six sigma based relational data base model. Book of abstracts of the International conference on Learning and Teaching 2013: Transforming Learning and Teaching to meet challenges of 21st century Education: p.65, Taylors University, Grand Slam, Sha Alam, Malaysia, 2013.
5. Hariharan R, Mohanasundaram K. Impact of Six Sigma – DMAIC Approach in Learning the ICT Concept by the Prospective Teachers. In Linda Daniela., Ineta Lūka., Lūcija Rutka., & Irēna Žogla (Eds.) The Teacher of the 21st Century: Quality Education for Quality Teaching. Newcastle upon Tyne, London, UK: Cambridge Scholars Publishing, P. 208-218. ISBN 2014; 13:978-1-4438-5612-6.
6. Hariharan R, Zašcerinska J, Andreeva N, Zašcerinskis M, Aļeksejeva L. Comparative Analysis of Quality of Student Teachers' Performance in India and Latvia. International Journal of Modern Education Forum (IJMEF) 2015; 4(1):8-17. Print ISSN 2324-6928, online ISSN 2324-6944. <http://www.ijmef.org/AllIssues.aspx>.
7. Hariharan R, Zašcerinska J. Six sigma – A New trend in Educational Research –A comprehensive approach with case studies. Germany, Globe Edit (Omni Scriptum), 2015.
8. NACC Quality Indicators for Teacher Education. Bangalore, National Assessment and Accreditation Council, Vancouver, Canada, Commonwealth of Learning (COL), 2007.
9. O'Neill M, Duvall C. A Six Sigma quality approach to workplace evaluation, Journal of facilities management. 2005; 3:240-253.