

A Study of Data Visualization among M.Ed. Research Dissertation

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Abstract:

This present research study was devoted to Data Visualization among M.Ed. Research Dissertation. As per given title the objective of this study was to find out data visualization process among M.Ed. Dissertation. The method of this present study was a survey. The data was collected by using Checklist. The population of present study was M.Ed. dissertations seen year 2006 to up to 2023 . There were 460 dissertations carried out by M.Ed. research students. The sample of present study was Purposive. By applying a purposive sampling process researcher selecting 192 dissertations from Year- 2011 to Year-2023. In the present study researchers focused on the theoretical background of data visualization technique. Also given AI tools for graphical presentation. The findings of present study were, the M.Ed researchers mostly use simple Bar, Multiple Bar and Pie charts for data visualization.

Key Words: Data visualization, data visualization technique.

Introduction:

Sports-related injuries pose significant challenges for athletes, impacting performance and long-term health. Establishing clear, evidence-based return-to-sport (RTS) decision criteria is necessary to ensure safe and timely reintegration into athletic activities while minimizing the risk of re-injury. This systematic review aims to synthesize current RTS criteria used across different sports and injury types.

Research is a systematic process of gaining new knowledge. The most important phenomena of research is formulating research problems and as per research problem designing the research process. In the process of research data collection is an innovative mine of research because findings are hidden in the form of data. In the research process data is any information that has been collected, observed, generated or created to validate original research findings. Although usually digital research data also includes no digital formats such as laboratory notebook and diagram. In the research process data plays a vital role. It consists of raw facts that when proceed, provide meaningful information. Data is categorised as either qualitative (descriptive, non numeric) or quantitative (numeric and measurable). Most challenging process is visualization of data in the research after qualitative or quantitative analysis.

Data visualization is the process to publish findings in the form of charts, graphs, maps etc. It translates complex, high-volume, or numerical data into a visual representation that is easier to process. Data visualization tools improve and automate the visual communication process for accuracy and detail. Data visualization helps researchers to identify patterns and trends in data.

Data visualization helps researchers to communicate their findings to a wider audience. Data visualization helps researchers to make data more accessible and understandable. So that researcher decided to find out data visualization among M.Ed. Dissertation.

Objective of Study : - To find out data visualization process among M.Ed. Dissertation

Method : - Survey

Population:- M.Ed dissertation

Sample :- Purposive Sample , selecting dissertation from Year- 2011 to Year-2023 . so that 192 dissertations were samples of present study.

Tools :- In the present study data were collected from by using checklist. Checklist was prepared by researcher to collect information about types of bars

Diagrammatic and Graphical Presentation of Data:-

It is the one of the most convincing and appealing ways in which statistical results are presented by diagram and graphs. Diagrammatic and Graphical Presentation of data is very useful.

Key Features Diagrammatic and Graphical Presentation of Data:-

- Attractive
- Easy to understand

- Facilitate comparison of the data relating to the period of the time of different regions.
- Great memorising effect
- Visual communicative

Types of Diagrams

1. One- dimensional diagram
2. Two- dimensional diagram
3. Three- Dimensional diagram
4. Pictorial and Cartogram
5. Line charts

1. One- dimensional diagram: One dimensional diagrams are also known as Bar-diagrams. These are very common types of diagrams used in practice. These are called one dimensional because it is only the length of the bar that matters not the width. They can be drawn in lines also when the number of items is large. They are the simplest and easiest to make. They are the simplest and easiest to make. They are generally used to compare the relative amounts of some traits (intelligence, Education, Achievements) possessed by two or more groups.

Types of Bar diagram:-

- Simple Bar-diagram
- Sub-divided Bar-diagram
- Multiple Bar-diagram

Simple Bar-diagram:- Simple bar-diagram is used to represent only one variable.

Sub-divided Bar-diagram:- In a sub-divided bar diagram each bar representing the magnitude of a given phenomenon is further subdivided in its various components.

Multiple Bar-diagram:- In multiple bar -diagram two or more sets of interrelated data are represented. These can be used when we want to compare two or more related variables.

2. Two- dimensional diagram:- In two dimensional diagrams. In two dimensional diagrams the length as well as width of the bar is considered.

Types of diagrams

- Rectangles
- Squares
- Circles

3. Three -Dimensional- diagrams:- Three dimensional diagrams also known as volume diagrams, consists of cubes, cylinders, spheres etc. In these diagrams three things namely Length, breadth and height have to be taken into account. These diagrams are used where the range of difference between the smallest and the largest value is very large.

4. Pictograph and Cartograms:- Pictographs are very popular and used very promptly in presenting statistical data.

5. Line charts:- A line chart displays information as a series of data points connected by straight line segments. Line charts are also known as line graphs or line plots. They are used to show how data changes over time.

There are three main types of line charts:

- Simple,
- Multiple, and
- Compound.
- Simple line chart

A single line is plotted on the graph in the single line form. Multiple line charts are More than one line is plotted on the same axes. Useful for comparing similar items over time. Whereas in Compound line chart data is subdivided into two or more types of data.

6. Histogram:- It is the most popular and widely used method of presenting a frequency distribution.

7. Frequency polygon:- Frequency polygon is another type of graph of frequency distribution.

On the website www.datylon.com. According to bess, kosma (May-2022); 80 types of charts and graphs are used for data visualization. He gives 80 types of graphs with demonstrations on a given website. These tools are very beneficial in the future to all emerging researchers for visualisation of research data.

On the website <https://guides.library.georgetown.edu/datavisualization>, as of January 2025, 25 AI tools for data visualization are listed. These include: Tableau, Looker Studio, Zoho Analytics, Sisense, IBM Watson Analytics, Qlik

Sense, Domo, Microsoft Power BI, Klipfolio, SAP Analytics Cloud, Yellowfin, Whatagraph, Dundas BI, Infogram, Chartio, Google Charts, Microsoft Excel, R with ggplot2, Matplotlib, TIBCO Spotfire, Grafana, Datawrapper, Visme, ChartBlocks, and Power BI Report Server.

Each of these tools is illustrated with demonstrations and examples of use. They are designed to be accessible, practical, and highly beneficial for academicians and researchers engaged in data visualization.

Deepmala, Srivastava (2023).An Introduction to Data Visualization Tools and

Techniques in Various Domains, International Journal of Computer Trends and Technology Volume 71 Issue 4 : - This research paper introduces data visualization tools and techniques in various domains. The importance of data visualization in enhancing the understanding and communication of complex data is discussed, along with the various types of data visualization tools and techniques available. The paper also covers the use of data visualization in business, social sciences, humanities, sports, environmental sciences, and healthcare. The paper concludes with a summary of the key takeaways and the potential impact of data visualization tools and techniques in various domains. The paper aims to provide a comprehensive overview of data visualization tools and techniques and to highlight their importance in various fields for effective data communication and analysis.

Angela Mattia (2021). Data visualization: an exploratory study into the software tools used

Data visualization is a key component to business and data analytics, allowing analysts in businesses to create tools such as dashboards for business executives. Various software packages allow businesses to create these tools in order to manipulate data for making informed business decisions. The focus is to examine what skills employers are looking for in potential job candidates, and compare with the ability to include those technological skills in a business school curriculum. The researchers explored a variety of software tools, and reported their initial results and conclusions

Table .No.1 Descriptive Data Analysis showing Year and Percentage of graphical Presentation:

To find out the data visualization process among M.Ed. Dissertation

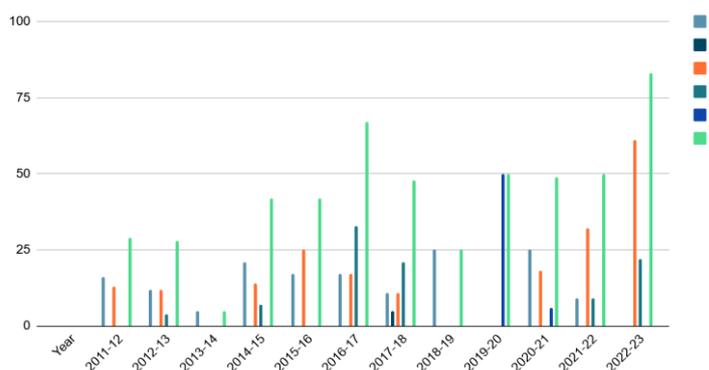
S.N.	Year	No.of Dissertation	Simple Bar		Sub-divided Bar		Multiple Bar		Two Dimensional Bar (Pie- Chart)		Line Bar		Total
				% age		% age		% age		% age		% age	
1	2011-12	32	05	16	-	-	04	13	-	-	-	-	29
2	2012-13	26	03	12	-	-	03	12	01	4	-	-	28
3	2013-14	20	01	5	-	-	-	-	-	-	-	-	05
4	2014-15	14	03	21	-	-	02	14	01	7	-	-	42
5	2015-16	12	02	17	-	-	03	25	-	-	-	-	42
6	2016-17	06	01	17	-	-	01	17	02	33	-	-	67
7	2017-18	19	02	11	01	5	02	11	04	21	-	-	48
8	2018-19	04	01	25	-	-	-	-	-	-	-	-	25
9	2019-20	02	-	-	-	-	-	-	-	-	01	50	50
10	2020-21	17	01	25	-	-	03	18	-	-	01	6	49
11	2021-22	22	02	9	-	-	07	32	02	9	-	-	50
12	2022-23	18	-	-	-	-	11	61	04	22	-	-	83

Interpretation:-

1. In the year 2011-12, 16 percent researchers used Simple Bar and 13 percent researcher used Multiple Bar for data visualization. That means 29 percent of researchers used Simple and Multiple Bars for data visualization.
2. In the year 2012-13, 12 percent researchers used Simple Bar, 12 percent researcher used Multiple Bar and 4 percent researcher used **Two Dimensional Bar (Pie- Chart)** for data visualization. That means 28 percent of researchers used Simple and Multiple Bar and **Two Dimensional Bar (Pie- Chart)** for data visualization.
3. In the year 2013-14, 5 percent researchers used Simple Bar, for data visualization. That means 5 percent of researchers used Simple and Multiple Bar and **Two Dimensional Bar (Pie- Chart)** for data visualization.

4. In the year 2014-15, **21 percent** researchers used Simple Bar, **14 percent** researcher used Multiple Bar and **07 percent** researcher used **Two Dimensional Bar(Pie- Chart)** for data visualization. That means **42 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
5. In the year 2015-16, **17 percent** researchers used Simple Bar, **25 percent** researcher used Multiple Bar for data visualization. That means **42 percent** of researchers used Simple and Multiple Bar were used for data visualization.
6. In the year 2016-17, **11 percent** researchers used Simple Bar, **5 percent Sub-divided Bar**, **11 percent** researcher used Multiple Bar and **33 percent** researcher used **Two Dimensional Bar(Pie- Chart)** for data visualization. That means **67 percent** of researchers used Simple and Multiple, **Sub-divided** and **Two Dimensional Bars(Pie- Chart)** for data visualization.
7. In the year **2017-18**, **11 percent** researchers used Simple Bar, **11 percent** researcher used Multiple Bar and **21 percent** researcher used **Two Dimensional Bar(Pie- Chart)** for data visualization. That means **48 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
8. In the year **2018-19**, **25 percent** of researchers used Simple Bars for data visualization. That means **25 percent** of researchers used Simple Bar for data visualization.
9. In the year **2019-20**, **50 percent** of researchers used Line Bars for data visualization. That means **50 percent** of researchers used Line Bars for data visualization.
10. In the year 2020-21, **25 percent** researchers used Simple Bar, **18 percent** researcher used Multiple Bar and **06 percent** researcher used **Line Bar** for data visualization. That means **49 percent** of researchers used Simple and Multiple Bar and **Line Bar** for data visualization.
11. In the year **2021-22**, **09 percent** researchers used Simple Bar, **32 percent** researcher used Multiple Bar and **09 percent** researchers used **Two Dimensional Bar(Pie- Chart)** for data visualization. That means **50 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
12. In the year 2022-23, **61 percent** researchers used Multiple Bar and **22 percent** researchers used **Two Dimensional Bar(Pie- Chart)** for data visualization. That means **93 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.

Descriptive Data Analysis showing Year and Percentage of graphical Presentation



Results:

1. In the year 2011-12, **29 percent** of researchers used **Simple and Multiple** Bars for data visualization.
2. In the year 2012-13, **28 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
3. In the year 2013-14, **5 percent** of researchers used **Simple Bar** for data visualization.
4. In the year 2014-15, **42 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
5. In the year 2015-16, **42 percent** of researchers used Simple and Multiple Bar were used for data visualization.
6. .In the year 2016-17, **67 percent** of researchers used Simple and Multiple, **Sub-divided** and **Two Dimensional Bars(Pie- Chart)** for data visualization.
7. In the year **2017-18**, **48 percent** of researchers used Simple and Multiple Bar and **Two Dimensional Bar(Pie- Chart)** for data visualization.
8. In the year **2018-19**, **25 percent** of researchers used Simple Bar for data visualization.
9. In the year 2019-20, **50 percent** of researchers used Line Bars for data visualization.

10. In the year 2020-21, **49** percent of researchers used Simple and Multiple Bar and **Line Bar** for data visualization.
11. In the year **2021-22**, **50** percent of researchers used Simple and Multiple Bar and **Two Dimensional Bar (Pie-Chart)** for data visualization.
12. In the year 2022-23, **93** percent of researchers used Simple and Multiple Bar and **Two Dimensional Bar (Pie-Chart)** for data visualization.

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