ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26AUG181

Bridging the Great Divide: The Universal Imperative of Research Methodology and Data Visualization under the NEP-2020 Framework

Raghvendra Kumar Gupta
Department of Botany, Government Degree College Indora, Kangra,
Himachal Pradesh, India

Abstract
Background: The implementation of the National Education Policy (NEP-2020) in India marks a paradigm shift from rigid disciplinary boundaries toward a holistic, multidisciplinary educational ecosystem. Central to this transformation is the "Necessity of Research Methodology," which serves as the structural backbone for both the Humanities and the Sciences. **Objective:** This paper explores the critical role of standardized data handling techniques and statistical visualization as essential competencies for students and researchers across diverse streams—ranging from Commerce and Management to Environmental and Scientific studies. **Methodology:** The study employs a comparative analytical approach to examine how data handling requirements differ and converge across disciplines. It evaluates the shift from qualitative narratives in Humanities to quantitative rigor in Sciences, and how NEP-2020 advocates for a "transdisciplinary" literacy in research tools. **Key Findings:** Our analysis suggests that: (1) Statistical Literacy is no longer an optional skill for Humanities but a fundamental requirement for evidence-based policy making. (2) Data Visualization acts as a "universal translator," allowing complex scientific data (e.g., climate change metrics) to be communicated effectively within socio-economic and management contexts. (3) The integration of Computational Thinking across all streams—as envisioned by NEP-2020—minimizes the "silo effect" and enhances the reproducibility of research. **Conclusion:** The paper concludes that a robust foundation in research methodology is the primary catalyst for achieving the cross-disciplinary goals of NEP-2020. By mastering data handling and visualization, researchers can transcend traditional academic borders, fostering innovation that is both scientifically sound and socially relevant.

Keywords:
NEP-2020,Research Methodology, Data Visualization, Multidisciplinary Education, Higher Education

1. Introduction: The Renaissance of Indian Education

The National Education Policy 2020 (NEP-2020) is not merely a policy update; it is a structural overhaul of the Indian intellectual identity (Government of India, 2020). For decades, the Indian education system was characterized by "water-tight compartments"—a student of Physics had little reason to engage with Sociology, and a Commerce major was rarely expected to understand Environmental Biology.

However, the challenges of the 21st century—climate change, global pandemics, and the digital economy—are inherently multidisciplinary. NEP-2020 recognizes that the solution to a "Scientific"

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26AUG181

problem often lies in "Humanities" (behavioral change) and "Commerce" (economic viability). The glue that holds these disparate fields together is Research Methodology (RM).

1.1 The Problem Statement

Despite the push for multidisciplinary studies, a significant "literacy gap" exists. Humanities students often fear quantitative data, while Science students may struggle with the qualitative nuances of social impact. This paper argues that by standardizing Data Handling and Visualization, we can create a common language that fulfills the NEP-2020 vision.

2. Theoretical Framework: Research Methodology as a Core Competency

Research Methodology is the systematic way to solve a problem. Under NEP-2020, it is no longer a post-graduate requirement but a foundational skill.

2.1 The Philosophy of Science vs. The Philosophy of Humanities

Traditionally, the Sciences relied on Positivism (objective truth, measurable data), while the Humanities relied on Interpretivism (subjective meaning, social constructs).

- **The NEP-2020 Shift:** The policy encourages Pragmatism, a philosophical position that argues the most important thing is the "research question" (Government of India, 2020). If a question requires both a survey (qualitative) and a chemical test (quantitative), the researcher should be equipped to do both.

2.2 The Four Pillars of the New Research Paradigm

- **Critical Thinking:** Moving from "what to think" to "how to think."
- **Holistic Inquiry:** Looking at a problem from 360 degrees.
- **Ethical Integrity:** Understanding plagiarism, data privacy, and intellectual property.
- **Digital Literacy:** Proficiency in software and digital archives.

3. The Necessity of Data Handling Techniques

Data handling is the process of ensuring that raw information is processed into "clean" data ready for analysis. In the context of NEP-2020, this must be taught across all streams.

3.1 Quantitative Techniques (Sciences and Commerce)

- **Descriptive Statistics:** Mean, median, mode, and standard deviation. These are the basics for any Management or Science student to understand "typical" behavior in a system.
- **Inferential Statistics:** Using T-tests, ANOVA, and Regression to make predictions. In Commerce, this predicts market growth; in Environmental Science, it predicts temperature rises.
- **Software Proficiency:** Moving beyond Excel to R, Python, and SPSS to manage robust datasets (Field, 2013).

3.2 Qualitative Techniques (Humanities and Management)

- **Thematic Analysis:** Identifying patterns in interviews or historical texts to draw meaningful interpretations (Silverman, 2020).
- **Content Analysis:** Quantifying the presence of certain words or themes in media.
- **Ethnography:** Deep immersion into a social setting to gather rich, contextualized data (Silverman, 2020).

4. Data Visualization: The Bridge Between Disciplines

If Data Handling is the "engine" of research, Visualization is the "dashboard." Effective design of tables and graphs is the most reliable way to communicate complex findings to non-experts—a critical requirement for cross-disciplinary policy-making (Few, 2012).

4.1 Why Visualization Matters for the Humanities

Historians can now use Geospatial Mapping (GIS) to show the spread of ancient civilizations. Sociologists use Network Diagrams to visualize social influence. This "Digital Humanities" approach makes the subject more rigorous and interactive.

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26AUG181

4.2 Why Visualization Matters for the Sciences

Scientists often struggle to communicate the urgency of their findings. A complex table of carbon emissions data might be ignored, but an Animated Time-Series Map showing the shrinking of the Arctic ice cap is visceral and persuasive.

5. Case Study: A Multidisciplinary Analysis of Urban Sustainability

Context: Consider a city facing a "Heat Island" effect.

- **The Scientific Task:** Deploying temperature sensors and analyzing satellite imagery (Data Handling: Spatial Statistics).
- **The Management Task:** Analyzing the electricity consumption of air conditioning and the economic cost of heat-related illness (Data Handling: Cost-Benefit Analysis).
- **The Humanities Task:** Interviewing residents in low-income housing about their lived experience of heat (Data Handling: Qualitative Coding).

The NEP-2020 Outcome: By using a unified Research Methodology, these three teams produce a "Multidisciplinary Report" where visualizations of temperature are overlaid with heat-map data of poverty and economic loss.

6. Strategic Implementation under NEP-2020

To realize this vision, higher education institutions (HEIs) must adopt several strategic reforms to navigate current challenges and opportunities (Bhardwaj, 2022):

- **Common Foundation Courses:** A mandatory course in "Data Literacy and Research Ethics" for all first-year undergraduates, regardless of their major.
- **Credit-Based Internships:** Encouraging students to take internships where they apply data handling in a field different from their own (e.g., a Literature student working on a digital archive project).
- **The Role of the National Research Foundation (NRF):** The NRF, as proposed by NEP-2020, should prioritize funding for projects that demonstrate high-quality data visualization and cross-disciplinary RM.

7. Challenges and Critical Reflections

Despite the policy's ambition, practical barriers remain in the higher education landscape (Bhardwaj, 2022):

- **The Digital Divide:** Students in rural areas may lack the hardware to run advanced statistical software.
- **Faculty Training:** There is an urgent need for "train-the-trainer" programs to update faculty on modern research tools.
- **Assessment Overhaul:** We cannot teach modern RM if exams still ask for rote definitions. Assessments must be project-based.

8. Conclusion

The "Necessity of Research Methodology" is not a burden; it is an opportunity. By embracing data handling and visualization, we fulfill the spirit of NEP-2020—to create an India that is a "Global Knowledge Superpower." When a poet understands a spreadsheet and a scientist understands a social narrative, we move closer to solving the complex problems of our time. The methodology is the bridge, and the data is the path.

9. References

- Bhardwaj, A. (2022). Implementation of NEP-2020: Challenges and opportunities in higher education. *Indian Journal of Educational Research, 5*(2), 112–128.
- Few, S. (2012). *Show me the numbers: Designing tables and graphs to enlighten*. Analytics Press.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.
- Government of India. (2020). *National education policy*. Ministry of Education.
- Silverman, D. (2020). *Qualitative research*. Sage.