

## **Short-Term Capacity Building Programme on Statistical Analysis: Theory and Practice (Applications of SPSS and R Software in Research)**

An eight-day ‘Short-Term Capacity Building Programme on Statistical Analysis: Theory and Practice (Applications of SPSS and R Software in Research)’ was organized by the Association of Indian Universities-Dayalbagh Educational Institute-Academic and Administrative Development Center (AIU-DEI-AADC) from November 28, 2023 to December 5, 2023. Fifty-four participants from different Institutes/Universities attended the programme in blended mode. The overall course content was divided into 16 modules and each day into two sessions. There were seven renowned resource persons from diverse academic disciplines.

The inaugural function started with the Institute’s prayer. Prof. Poornima Jain, the convener of the programme, welcomed the guests and participants. She introduced the programme and mentioned its objectives. The Chief Guest of the inaugural function was Dr. V. M. Katoch, former Director-General, of the Indian Council of Medical Research (ICMR) and the chair, of the National Academy of Sciences, India (NASI). He highlighted the significance of data analysis and statistical software in research. The Director of the Dayalbagh Educational Institute (Deemed to be University), Prof. C. Patvardhan, expounded on the implications of data in research and stressed the necessity for extreme caution when analyzing data. Dr. Amrendra Pani, Joint Director and Head, of the Research Division, Association of Indian Universities focused on the importance of AADC and the effectiveness of data analysis in research through technology. He urged future planners to develop similar initiatives to further educational goals. Prof. Anand Mohan, Registrar of the Dayalbagh Educational Institute (Deemed to be University) also graced the occasion with his presence. Prof. Jyoti Gogia, Nodal Officer, of the AIU-DEI-AADC, extended the vote of thanks. The Inaugural Function ended with the Institute’s Song and the National Anthem.

On the first day of the program, Prof. Diwakar Khare, former Director and former Head of the Department of Statistics, Institute of Social Sciences, Dr. B. R. Ambedkar University, Agra, Uttar Pradesh, explained basic statistical analysis. He discussed planning, collecting, analyzing, and drawing meaningful inferences from data. He emphasized that for valid conclusions careful planning is essential in research. He highlighted how to organize and summarize data using descriptive statistics and various ways of tabulation and graphical representation of data. He explained how to specify the hypothesis and make decisions regarding research design and

specifically sampling framework. He further explained using inferential statistics to test the hypothesis to draw meaningful results.

On the second day, Dr. Saurabh Mani, Associate Professor, Department of Applied Business Economics, Faculty of Commerce, Dayalbagh Educational Institute (Deemed to be University), talked about the significance of hypothesis testing which depends upon how accurately the investigator wants to determine the prevalence. He highlighted the difference between the parametric and non-parametric tests. He explained in detail various parametric tests viz. t-test, z-test, and f-test for hypothesis testing.

Prof. V.K. Gangal, Head, Department of Applied Business Economics and Dean, Faculty of Commerce, Dayalbagh Educational Institute (Deemed to be University), and Prof. S. P. Saxena, Professor, Department of Applied Business Economics, Faculty of Commerce, Dayalbagh Educational Institute (Deemed to be University) highlighted the significance of qualitative data in research and the use of non-parametric tests for testing the hypothesis. Run tests, one sample and two sample sign tests, Mann-Whitney U Test, Wilcoxon Signed Rank Test, and the Kruskal-Wallis Test were the major tests highlighted by them.

Practical sessions started from day three. All the participants were provided a web link to download the SPSS (Statistical Package for the Social Sciences) software. This helped the participants to have a hands-on experience with the software. Prof. Vineeta Singh, Professor, Department of Statistics, Institute of Social Sciences, Director, Institute of Fine Arts, Dr. B. R. Ambedkar University, Agra, Uttar Pradesh, has introduced the software SPSS and explained data management viz. preparing, entering, and importing data in SPSS. Further, she explained the graphical representation of the data through software. She built a comprehensive understanding of data management techniques, including data cleaning, organizing, and analyzing descriptive statistics. She has also focused on how to interpret the output provided by the software. She successfully provided foundational knowledge and practical skills essential for effective data handling and drawing inferences using SPSS. Prof. Vineeta Singh gave in-depth knowledge and applications of the parametric and non-parametric tests, correlation and regression, and univariate and bivariate data analysis using SPSS.

Dr Manoj Kumar, Post Doctoral Associate (Data Science, Biostatistics, Health Economics), McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh,

Pennsylvania, USA, has taken online sessions. In the beginning, he talked about discriminant analysis, unstandardized discriminant function, and classification of cases using discriminant function. Further, he introduced R software to participants. Participants gained foundational functionalities of R software and R studio. He covered frequency distribution, descriptive statistics, and diagrammatic representation of data. He also highlighted correlation and regression. He distinguished between SPSS and R software and R Studio and provided hands-on experience with R software to the participants.

Dr. Aparna Satsangi, Assistant Professor, Department of Chemistry, Faculty of Science, Dayalbagh Educational Institute (Deemed to be University), talked about factor analysis and its uses and conditions. She explained factor loading, computation of Eigenvalues, and total variance accounted by extracted factors. Further, she elaborated on cluster analysis and statistics associated with cluster analysis. She discussed the applications of factor analysis and cluster analysis using SPSS.

Finally, in the concluding session, the programme report was presented by the convener Prof. Poornima Jain. All of the participants were given the chance to freely express their opinions about the program, and some of them stressed how important it was to them. Additionally, a gesture of gratitude was extended to the administration of the Institute, the AIU team, resource persons, participants, and the organizing team, which included students, faculty members, technical staff, and other staff members who collaborated to plan the event. Certificates were given to each participant and the members of the organizing committee by Prof. Poornima Jain. The programme ended with the Institute's song and the National Anthem.