

Master of Education (M.Ed)

Title of the Course: R 3: Quantitative Research Perspectives in Education (Semester: II)

Credits: 4

MM: 100 (External: 70 Internal: 30)

Contact Week 15

Introduction of the Course

The aim of this course is to focus on the foundations of positivist research approach and method in the light of the paradigms and processes of educational research. This course will introduce learners to the philosophical and epistemological basis of educational research as derived from positivist traditions. It is focused on enhancing the theoretical and conceptual basis for undertaking a research problem, helping students design a study to address a research problem, including methods of data collection and analysis.

It is important to discern the purpose, problem, research questions, hypotheses, methods of conducting research and analysis, and engaging in basic concepts necessary for understanding descriptive and inferential (parametric) statistics, including the assumptions behind parametric and nonparametric statistics. The paper will develop an understanding of techniques of data analysis in order to derive meaning from quantitative research studies and for conducting quantitative research

Learning Outcomes

After completion of the course student will be able to:

1. Identify the several components of research approaches that characterise quantitative research methods, understand the sources of quantitative data and research tools.
2. Analyze the experimental research designs under experimental, survey and correlational researches
3. Engage with basic concepts necessary for understanding descriptive and inferential statistics, including the assumptions behind parametric and nonparametric statistics
4. Learn to apply statistical techniques to a body of data in an appropriate manner and interpret quantitative data subject to statistical analysis
5. Review the statistical techniques used to analyse data in published researches

Number of Units: 4

Weeks 15 = 60 hours

Unit 1: Foundations of Quantitative Research in Education


(2 weeks = 8 hours)

- Positivist and Post-Positivist Paradigms
- Variables, tools in Quantitative Research- Questionnaires, Checklists, psychological tests

Unit 2: Quantitative Research Designs

(3 weeks = 12 hours)

5

 1 | 3
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- Sample size, Sampling Designs and its appropriateness to Quantitative research
- Experimental Research Designs- Pre-Experimental, True Experimental, Quasi Experimental designs and its importance in educational research.
- Survey Research and Correlational Research.

Unit 3: Descriptive Statistics and Other Measures (5 weeks = 20 hours)

- Scales of measurement and problems of statistical treatment.
- Frequency and Graphical methods
- Understanding of Measures of Central Tendency (Mean, Median, Mode), Measures of variability (Range, Inter quartile range, Standard deviation)
- Correlation (Pearson and Rank order), Regression
- Z-scores
- Applications of NPC

Unit 4: Inferential Statistics (5 weeks = 20 hours)

- Hypothesis testing , One-tailed, two-tailed tests, Critical ratio
- Standard errors of measurement - Type I and II errors
- Parametric tests: t-tests and its significance, concept of ANOVA and ANCOVA
- Theoretical concept of Multivariate Analysis
- Non-parametric tests: Mann-Whitney and Chi-square tests and their applications

Practicum/ Suggested Projects / Assignments (Any Two)

1. Develop a rubric to assess good Research work.
2. Identify a research area in the field of education. Develop a research tool that helps in collecting the data.
3. Identify broad topic of interest. State purpose and hypotheses. Discuss the effect on research outcomes, if the nature of hypotheses is modified.
4. Interpret the results of Quantitative data using excel, software tools like SPSS, JAMOVI etc.

Note: On the basis of the above, the teacher may design his/her own relevant projects/ assignments.

Essential/ Recommended Readings

- Agresti, A and Finlay, B(2009). Statistical Methods for the Social Sciences: United States.
- Cohen, L., L. Manion and K. Morrison.(2000). Fifth Edition. Research Methods in Education. Routledge Falmer
- Creswell, J. W. (2003). Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Second Edition. University of Nebraska
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). SAGE Publications.
- Garrett, H. E. (2005). Statistics in Psychology and Education. Surjeet publications.

6

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- King, B. M., Rosopa, P. J., & Minium, E. W. (2010). Statistical reasoning in the behavioral sciences. Wiley Global Education.

Additional Readings

- ASER Centre. (2014). Middle Schools in India: Access and Quality | MacArthur Foundation Grant No. 11-99655-00-INP. (A.2: Baseline survey questionnaires)
- Converse, J. and S. Presser. (1986). Survey Questions: Handcrafting the Standardized Questionnaire, Issue 63.
- Healey, J. Ninth Edition. Statistics- A Tool for Social Research, WadsworthCengage Learning, Student Copy ISBN-978-1-111-18636-4
- King, G. R. O. Keohane & S. Verba (1994) Designing Social Inquiry. Princeton University Press. (Chapter 1, pp. 3- 32).

Teaching Learning Resources (Digital and others):

- Statistical Package for Social Sciences (SPSS)
- Microsoft Excel
- <https://www.jamovi.org/>

Teaching Learning Process


The course will be taught through interactive pedagogic methods such as classroom discussion, debates, film discussions, critical media analysis, collaborative learning tasks which enhance reading comprehension of core writings in the area and innovative projects. Reflective expression and learning will be encouraged.

Assessment Method

The assessment will be formative in nature and will factor in student participation. Individual and group tasks and assignments will be given. Summative evaluation will be done through end-semester examination.

Key words: Quantitative research, Descriptive Statistics, inferential Statistics and SPSS.

(7)


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