

Methods of Science and Mathematics Education Research

By Aniket Sule and Shweta Naik

Class Meetings:

Tuesday 11 am to 1 pm

Wednesday 11 am to 1 pm

This course on the foundations of educational research will attempt to provide a broad overview of the different types of educational researches. It also aims to assist students in their understanding of quantitative and qualitative methods. The specific objectives of the course are:

- Gain skills with techniques associated with qualitative and quantitative methods, in particular with interviewing, observation, and analysis of the data.
- Gain expertise in critiquing and assessing the quality of articles that use these methods in educational research.

Weekly Schedule:

There will be total 26 class sessions, and given here is a tentative topic-wise schedule. Our first class is on 12th January 2016. There will be no class on 26th January 2016.

Major texts that will be revisited often in the class are given below in the references. There will be more readings and those will be announced/assigned a week in advance by the instructor of the course.

	Topic	Dates (Day)	Instructor(AS/SN)
1	Introduction to educational research	Jan 12, Jan 13	SN
2	Measurement/ Sampling	Jan 19, Jan 20	AS
3	Qualitative data analysis	Jan 27, Feb 2	SN
4	Quantitative data analysis	Feb 3, Feb 9	AS
5	Choosing a statistical test	Feb 10, Feb 16	AS
6	Planning educational research	Feb 17, Feb 23	SN
7	Naturalistic /ethnographic research	Feb 24, Mar 1	SN / Students
8	Case studies, Multiple case study	Mar 2, Mar 8	SN / Students
9	Mix-methods or Complementary? ¹	Mar 9, Mar 15	SN

¹ Graduate faculty in education is faced with decisions about how best to prepare intending researchers and education leaders in research methodology. Often, these decisions are framed in terms of qualitative, quantitative, and mixed methods. But this framing under-represents the methodological resources and complexity of choices available to educational researchers. Moreover, long-standing debates illuminate fault lines within the field about quality in education research and about how different methodological traditions can or should be considered complementary in addressing complex social problems. During this session we will navigate this complex territory, exploring concrete possibilities for engaging in complementary work in developing our own programs of research.

10	Ex post facto research, Action Research	Mar 16, Mar 22	SN / Students
11	Experiments, Quasi-experiments	Mar 23, Mar 29	SN/Students
12	Perspectives from Philosophies of Science	Mar 30, Apr 5	SN
13	Perspectives from Social Science	Apr 6, Apr 12	SN

Assessment: The course assessment will be based on the following three criteria.

Classroom interactions (30%)

It is expected that each of us will come to class willing to share their understandings, and to challenge and be challenged by the ideas and topics of the assigned reading, in order to contribute to the learning of all class members. For the reading assignments in the texts, it is expected that we indicate passages that are interesting, unclear, provocative, or perhaps misleading, and bring those to the class discussion. Students are expected to listen to each other's arguments and to offer support or contrasting arguments as needed. For the entire course, we will maintain a shared document to record our questions, thoughts, actual quotations that we collect throughout the semester.

Seminar Presentations (30%)

Students will present some of the studies in pairs, where specific responsibilities of the presentation will be shared. The student seminars will be made in types of research section of the course.

Students in charge of leading the discussion will facilitate an interactive discussion of how the article illustrates that issue, strengths, weaknesses, main take-home points, and other important connections for the course.

Developing a Research Proposal (40%)

One major activity would be to prepare and submit in writing and make a presentation of a research proposal in detail. Through out the course, there will be different activities and submissions towards completion of the proposal.

References:

Cohen, L., Manion, L. & Morrison, K. (2011). Research methods in education, 7th Edition. Routledge. Special Indian Edition by Cambridge University Press India.

Charles C.M. (1995, Second Edition) Introduction to Educational Research, Longman USA

Minium, E.W and Clark, R.B. (1982). Elements of Statistical Reasoning, John Wiley and Sons, New York.

Kidder L.H , Judd C.M and Smith E.R. (1986, Fifth Edition) Research Methods in Social Relations, Holt Rhinehart and Winston Inc.

Kerlinger F.N. (1983, Second Indian Reprint) Foundations of Behavioural Research, Surjeet Publications

Baker T.L. (1988) Doing Social Research, McGraw Hill Inc.

Cresswell, J.W. (2002), Educational Research; Planning, Conducting and Evaluating Quantitative and Qualitative Research, Merrill Prentice Hall

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach: An interactive approach*. Sage.