

Methods of Science and Mathematics Education Research

Instructors: Shweta Naik, Sugra Chunawala, H. C. Pradhan

Class Meetings:

Monday 11 am to 1 pm

Friday 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.
- Gain expertise in designing a study and planning the analysis.

Course assessment:

Each student's performance will be graded on three aspects.

- Classroom Participation (20%): presence in the classroom and participation in the discussion.
- Student Seminars (40%): Each student will make two presentations. One, for the exemplar study for a type of research. The study for presentation will be chosen in discussion with the instructor/s. Two, the research proposal in progress. This is a major assignment of the class, described in the next point.
- Assignments (40%): Each instructor will assign some short assignments often during the course, make sure you understand and complete those. A cumulative assignment will continue through out the semester, in which you will build a working research proposal. The assignment will be built in parts, and specific prompts will be provided for each part. A final presentation of the entire document will be made on the last day of the class.

Weekly Schedule:

Our first class is on 16th January 2016. We meet every Monday and Friday. Students are advised not to miss any class unless it is extremely urgent. In case you miss the class, please make sure you discuss with the instructor and keep with the progress.

Major texts that will be revisited often in the class are given below in the table. Some readings are specific to those specific session/s. There might be more readings and those will be announced/assigned a week in advance by the instructor/s of the course. Some of those readings are listed in the weekly schedule given below.

List of the sessions				
No.	Date (Day)	Session Details	Instructor and format of the session	Associated Reading
1.	16 January 2017 (Monday)	Introduction to educational research – I	Sugra Chunawala, Lecture-discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
2.	20 January 2017 (Friday)	Introduction to educational research – II	Sugra Chunawala, Lecture-discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
3.	23 January 2017 (Monday)	Understanding Naturalistic /ethnographic research	Shweta Naik, Lecture-discussion	1. Emerson, R. M., Fretz, R. I., & Shaw, L. L. (1995). Writing ethnographic fieldnotes. Chicago: University of Chicago Press. 2. Cresswell, J.W. (2002)
4.	27 January 2017	Understanding Case /	Shweta Naik, Lecture-	1. Flyvbjerg, B. (2006). Five misunderstandings

	(Friday)	Multiple Case studies	discussion	about case-study research. <i>Qualitative inquiry</i> , 12(2), 219-245. 2. Cresswell, J.W. (2002)
5.	30 January 2017 (Monday)	Understanding Experimental and Quasi-experimental research	Shweta Naik, Lecture-Discussion- Activities	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
6.	3 rd February 2017 (Friday)	Data: Collection, Analysis and Ethics in Qualitative Research	Shweta Naik, Lecture-Discussion; Activities	1. Merriam, S. (2009). <i>Qualitative research: A guide to design and implementation</i> . San Francisco, CA: Jossey-Bass. 2. Lather, P. (1986). Issues of validity in openly ideological research: Between a rock and a soft place. <i>Interchange</i> 17(4), 63-84.
7.	6 th February 2017 (Monday)	No class Philosophy of Education Course		
8.	10 th February 2017 (Friday)	No class Philosophy of Education Course		
9.	13 th February 2017 (Monday)	Measurement/ Sampling	H. C. Pradhan, Lecture-Discussion	1. I. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
10.	17 th February 2017 (Friday)	Quantitative Analysis: Normal and Bell distribution	H. C. Pradhan, Lecture-Discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
11.	20 th February 2017 (Monday)	Quantitative Analysis: Choosing Tests, Test of	H. C. Pradhan, Lecture-Discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition);

		significance		3. Cresswell, J.W. (2002)
12.	24 th February 2017 (Friday)	Quantitative Analysis: Choosing Tests, Test of significance	H. C. Pradhan, Lecture-Discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
13	27 th February 2017 (Monday)	Quantitative data analysis: Kinds of inferential errors, least square regression and co-efficient	H. C. Pradhan, Lecture-Discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
14.	3 rd March 2017	Quantitative data analysis: ordinary and multiple regression	H. C. Pradhan, Lecture-Discussion	1. Cohen, L., Manion, L. & Morrison, K. (2011); 2. Charles C.M. (1995, Second Edition); 3. Cresswell, J.W. (2002)
15.	6 th March 2017	No class Philosophy of Education Course		
16.	10 th March 2017	No class Philosophy of Education Course		
17.	13 th March 2017	No class Holi Holiday		
18.	17 th March 2017	Research Skills: Developing research questions and the context	Sugra Chunawala, Lecture-Discussion- Activities	1. Merriam, S. (2009). Qualitative research: A guide to design and implementation. San Francisco, CA: Jossey-Bass.
19.	20 th March 2017	Research Skills: Conducting Interviews	Shweta Naik, Lecture-Discussion- Activities	1. Weiss, R. S. (1994). Learning from strangers: The art and method of qualitative interview

				<p>studies. New York: The Free Press</p> <ol style="list-style-type: none"> 2. Arendell, T. (1997). Reflections on the researcher researched relationship: A woman interviewing men. <i>Qualitative Sociology</i>, 20, 341-368. 3. Hermanowicz, J. C. (2002). The great interview: 25 strategies for studying people in bed. <i>Qualitative Sociology</i> 25, 479-499.
20.	24 th March 2017	Research Skills: Analyzing texts, developing codes	Shweta Naik, Lecture- Discussion- Activities	<ol style="list-style-type: none"> 1. Maxwell, J. A. (2005). <i>Qualitative research design: An interactive approach</i> (2nd ed.). Thousand Oaks, CA: Sage. We will read chapters 2, 3, 6, and 7 from this book. 2. Nespore, J. (2006). Finding patterns with field notes. In J. L. Green, G. Camilli & P. B. Elmore (Eds.), <i>Handbook of complementary methods in education research</i> (pp. 297-308). Mahwah, NJ: Erlbaum. 3. Weston, C., Gandell, T., Beauchamp, J., McAlpine, L., Wiseman, C., & Beauchamp, C. (2001). Analyzing interview data: The development and evolution of a coding system. <i>Qualitative Sociology</i> 24, 381-400.
21.	27 th March 2017	Research Skills: Subjectivities when Researcher as an Instrument	Shweta Naik, Lecture- Discussion- Activities	<ol style="list-style-type: none"> 1. Peshkin, A. (1988). In search of subjectivity— one's own. <i>Educational researcher</i>, 17(7), 17-21.

22.	31 st March 2017	Research Skills: Writing a Research Proposal	Sugra Chunawala, Lecture-Discussion- Activities	I. Maxwell, J. A. (2005). Qualitative research design: An interactive approach (2nd ed.). Thousand Oaks, CA: Sage.
23.	3 rd April 2017	Student Seminar - I	Sugra Chunawala, Leading Discussion	Examples of research from Science/Math Education
24.	7 th April 2017	Student Seminar - II	Sugra Chunawala, Leading Discussion	Examples of research from Science/Math Education
25.	10 th April 2017	Student Seminar - III	Sugra Chunawala, Leading Discussion	Presenting the Proposal – work in Progress