DEPARTMENT OF EDUCATION AND SPECIAL EDUCATION

QRM1806   Structural equation modelling in educational research, 7.5 credits

Strukturell ekvationsmodellering i utbildningsvetenskaplig forskning, 7,5 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Department of Education and Special Education on 2018-12-21, and is valid from Spring semester 2019.

Responsible Department
Department of Education and Special Education, Faculty of Education

Entry requirements

For admission to the course, the applicant has to be registered as a doctoral student in the third cycle or have a doctoral degree. The applicant should also have documented prior knowledge corresponding to the learning goals in the basic level QRM1800 course "Basic statistics for educational research, 7,5 credits" and the QRM1802 course "Regression analysis for educational research 7,5 credits", or similar.

Learning outcomes

The main purpose of the course is to provide an introduction to structural equation modelling (SEM) and how such models can be applied to educational science issues. The course also aims at developing the participants' ability to critically review educational research using structural equation modelling techniques. Upon completion of the course, the participants should be able to:

Knowledge and understanding

- Account for the basic statistical principles which SEM is based upon.
- Describe the connection between theories, data and models.

Competence and skills

- Prepare and organize data to be used for analyses in a SEM software.
- Formulate models with manifest and latent variables based on a given research problem.
- Evaluate model fit as well as modify models.
- Interpret results and report a SEM analysis.

Judgement and approach

- Evaluate the results of an analysis and interpret them in substantive terms.
- Critically scrutinize scientific work where SEM is applied.

Course content

Structural equation modeling (SEM) is a statistical analysis technology that has been widely spread for the last few decades in many social and behavioral research fields. SEM can be described as a further development of multiple regression analysis that allows analysis of both directly observable variables and latent, non-observable variables. With this technique it is possible to solve measurement problems with the help of confirmatory factor analysis, and structural relationship models make it possible to construct models where variables can be both independent and dependent variables. The course aims at giving participants insights into the basic principles of SEM, as well as the ability to specify, estimate and evaluate basic types of models. The course has a practical and applied perspective, and the use of the Mplus software is an important part of the course content.

Types of instruction

The main part of the course will be in on-line format. During the course, there will be three on-campus days (start at lunch day 1, a full second day, and end at lunch day 3) with lectures, seminars and workshops. Otherwise, the course is offered as an online course with lectures, seminars, literature studies, supervision and practical independent work. Course participants are expected to work independently and take responsibility for their own learning by reading the course literature, perform the practical work, and perform the tasks that are assigned by the course leaders. The teaching is largely based on the fact that the course participants themselves actively process the course literature, as well as prepare and participate in seminars and independently perform practical exercises in accordance with given instructions.

Language of instruction
The course is given in English.

English, unless all of the course participants agree on Swedish.

Grades

The grade Pass (G) or Fail (U) is given in this course.

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Types of assessment

The course is examined by various theoretical and practical assignments continuously during the course, and a final written report, in which SEM analyses is applied to educational data and the interpretation of the results are presented. A pass grade on the course also requires active participation in seminars and course assignments, as well as attendance at all mandatory tasks.

Course evaluation

A course evaluation will be carried out after the course. The course evaluation will be summarized, and made available to doctoral students. The evaluation will be used as a guide for the future development and planning of the course.

Other information

This is a third-cycle course and a specialised course within the national school of Quantitative Research Methods in education (QRM) for researchers. More information about QRM is available at qrm.gu.se.

Collaborating departments

Department of Education and Special Education, University of Gothenburg in collaborationwith Department of Applied Educational Science, Umeå University.

Technical equipment

In order to participate in the course, access to own computer / laptop is needed together with computer accessories for online communication which includes camera and a headset with headphones and mic, and the required statistical software (see list of literature).

Participant limitation and priority

The number of participants is limited to 15. Priority will be given to doctoral students within the Educational sciences if the number of applicants for the course is exceeding the number of places.