DEPARTMENT OF LEARNING, INFORMATICS, MANAGEMENT AND ETHICS

C7F5585, Construction and Validation of Measurement in Behavioral Science, 4.5 credits (hec)

Konstruktion och validering av beteendevetenskapliga mätningar, 4,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus is approved by the The Committee for Doctoral Education on 2023-12-19, and is valid from Spring semester 2024.

Responsible department

Department of Learning, informatics, Management and Ethics, Faculty of Medicine

Prerequisite courses, or equivalent

Knowledge of basic statistics including correlations and regression analysis.

Purpose & Intended learning outcomes

Purpose

During this course doctoral students will develop an ability to plan a process of creating a new measurement instrument and/or critically evaluating and validating an existing measurement instrument for the specific use in the student's own research.

Intended learning outcomes

After completing this course a doctoral students will be able to:
- Explain the measurement process taking into account test theories (classical and latent variables) as well as a theory behind a construct that is being measured;
- Carry out statistical analyses to estimate reliability and validity of a measurement instrument;
- Critically evaluate validity evidence taking into account the specific purpose of a measurement instrument;
- Plan a study design with an aim to develop a new measurement instrument (or validate an existing one) and test its reliability and validity.

Course content

The course covers those aspects of classical test theory and modern latent variables theory that are necessary for doctoral students to successfully use a measurement instrument in their research projects. These include the following topics: test construction, item analysis, reliability, validity, validity evidence, and validation strategy. Moreover, during the course students will not only learn the basics of test theories, but will also study which methods of statistical data analyses may be used to evaluate these theoretical principles in practice.
We will discuss the following statistical methods: descriptive statistics, correlation, linear regression, internal consistency analysis, and factor analysis.

Forms of teaching and learning

The teaching of the course is coaching-based, and thus it will follow the needs of each individual student's research project as well as the needs and previous knowledge of the entire group of students. Students will be able to choose to what extent they want to work individually or in small groups, to what extent they would like to be supervised in their work, and whether they want to work on their own data or on an example dataset provided. The course is equivalent to three weeks of full time study. However, during those three weeks only four days are planned for lectures and group discussions. The remaining time is reserved for students' own work on three examination assignments. Two of these assignments require students to run statistical analyses following the provided tutorials.

Students will be able to individually decide how advanced statistics they would like to learn and which statistical program they want to use. The course will start with short presentations of students' project work (students will be asked to prepare this before the course starts), followed by a goal setting workshop. Each student will be encouraged to set individual goals for the course that will drive his or her learning. Moreover, after the opening session the content of the lectures will be adjusted accordingly to the level of previous knowledge in the particular group of students.

During the first week of the course we will discuss basics of test construction, reliability of measurement, and latent variables theory. At the end of this week students will be required to submit a report presenting reliability and item analysis of a measurement instrument. During the second week students will be required to submit a report presenting factor analyses and regression/correlation analyses of an example instrument. At the end of the second week we will discuss the concept of validity, types of validity evidence, and validation strategies. We will also analyze an example validation process. Finally, the third week will be reserved for writing and peer reviewing final reports presenting a validation study design of a measurement instrument that students want to use in their own research.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Participation in open questions seminars and feedback seminars is compulsory, but there will be a possibility to attend online. Submission of the two short reports and the final paper is obligatory.

Forms of assessment

The examination consists of two parts. First, to pass a course student will have to submit on time two short but complete reports summarizing case studies analyzed as examples during the course. Second, a student will have to submit on time one longer paper presenting his or her own strategy for development and/or validation of a measurement instrument as applied to a specific use in student's own research. This paper will be graded pass or fail.

Course literature

Recommended literature:
Furr, R. M., & Bacharach, V. R. (2014). Psychometrics: an introduction. Los Angeles, CA: Sage Publications.
American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). Standards for educational and psychological testing. Washington, DC: American Educational Research Association.
Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2003). The theoretical status of latent variables. Psychological Review, 110(2), 203-219. http://doi.org/10.1037/0033-295X.110.2.203
Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2004). The concept of validity. Psychological Review, 111(4), 1061-71. http://doi.org/10.1037/0033-295X.111.4.1061