DATA SCIENCE YEAR AT THE UDP 2022
SEMINARS – OCTOBER

Speaker: Prof. Dr. Bernard Veldkamp, University of Twente, The Netherlands
Wednesday October 5th, 2022, at 11.30 am Chilean time

- Title of the seminar: The double helix of computerized adaptive testing and data science

- Abstract: In computerized adaptive testing (CAT) the difficulty of the items is adapted to the level of the respondent. In the past twenty years, CAT has become more and more popular in the fields of psychological, health and educational measurement. One of the main reasons why CAT became so popular lies in the reduction in test length without any loss in measurement precision. CAT has made testing much more efficient. In most applications, CAT relies on psychometric models. Unfortunately, this might be quite restrictive, because of the underlying assumptions of the different kinds of psychometric models that can be applied. The question arises whether CAT fully benefits from all the less structured data that is currently available and whether it is ready for the age of big data. In many applications, (big) data coming from multiple sources is used for measurement. Besides responses to test items, underlying traits could be measured using, for example, physiological data, process data, logfile data, video data and/or combinations of them. The process of combining data from all these sources is also referred to as adaptive measurement. Within this context, adaptivity not only refers to adapting to various data sources, but also to adapting the measurement to individual differences in data availability. For some respondents, data might be missing, incomplete or not usable because of data reliability and data quality issues. To handle these kinds of challenges, AI based algorithms have been applied successfully. In this presentation, the focus is on combining both adaptive measurement paradigms, on combining psychometrics and data sciences. What are the benefits, the limitations, the opportunities and the costs? Initial attempts have been made by combining information about response times and item responses in one hierarchical framework. One step further was to apply a Bayes framework for the combination of various sources of information. The ultimate challenge though is to integrate both CAT and AI in one algorithm to fully optimize adaptive testing and to create a double helix of adaptive measurement.

- Registration at: https://forms.gle/oBLCJSZu8K9zAjZy6

Prof. Dr. Bernard Veldkamp is Vice-Dean of Research of the Behavioral, Management and Social Sciences faculty at University of Twente. He is an expert in psychometrics, data science, and computerized adaptive testing. His research focuses on methods for data collection and data use for assessment purposes. His mission is to integrate psychometrics and data science in order to optimize measurement in the social sciences. Bernard did his PhD on the topic of automated test assembly and computerized adaptive testing. When more and more data about human behavior became available via the web, via sensors and via social media, he started to look for new methods to benefit from this data in measuring human behavior. He shifted his attention to data mining and the combination of psychometrics and data science. In 2008, he was one of the founders of the Research Center for Examination and Certification (RCEC). Bernard Veldkamp was awarded the title of Fellow of the Association for Evaluation and Assessment

Europe. He is one of the authors of the book Theoretical and Practical Advances in Computer-based Educational Measurement and he is editor of the Springer book series Methodology of Educational Measurement and Assessment.

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