

## **Factor Analysis Workshop for Social and Educational Research Data**

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### **ABSTRACT**

Research in social sciences and education often involves many variables that are correlated with each other and have a high correlation. In developing a research instrument, items are seen as a variable. In the case of involving high correlated variables, if a regression analysis is carried out then this high correlation becomes one of the problems of violation of assumptions. However, deleting variables that have a high correlation can result in loss of information. To overcome this problem, we can use Principal Component Analysis (PCA), a statistical method that aims to reduce variables by forming new uncorrelated components, which involve all variables. Whereas in terms of determining the appropriate construct from the items formed it can be done with two approaches, namely Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Problems related to variable reduction and construct formation in developing this instrument are very important in social science and education research. So that a method of analysis of PCA, EFA, and CFA using R and SPSS programs is needed.

Factor analysis workshops for social science and education research data were carried out on 27 and 28 June 2019 in the computer laboratory of the Mathematics Education Department of FMIPA UNY on the 3rd floor. The training was attended by 26 participants consisting of Bachelor graduates, post-graduate students, and several lecturers in the environment university in Yogyakarta. The speakers in this training were all the PPM Teams. Students as members are involved in the technical implementation of activities. The method used in the workshop is a direct tutorial and practice. This training begins with the initial introduction of the R program by practicing how to download and install the R program, recognize objects and basic command commands in R. The theoretical basis of PCA, CFA, and EFA is accompanied by simulations using R and SPSS programs and their application to scientific research data social and education.

Based on the results of the questionnaire, observations and question and answer with the training participants, it appears that the participants were eager to take part in the training activities. Participants can use factor analysis commands for social science and education research data and can provide interpretations of the outputs obtained in SPSS and R.

Kata Kunci: *Factor analysis, PCA, CFA, EFA*