

**Summary of doctoral thesis**  
**master of engineer Jan Radosz:**

*„Indices of the acoustic quality assessment of classrooms”*

Dissertation takes the issue of the acoustic quality of classrooms. The scientific goal of the study was to develop a comprehensive method of assessing the acoustic quality of educational spaces using the Singular Value Decomposition (SVD) method and subjective speech intelligibility tests. The need to develop it resulted from poor acoustic conditions in Polish schools, statistics of occupational diseases related to speech organ, as well as the significant impact of room acoustics on the voice effort, fatigue and speech intelligibility.

The basis for the method was measurements of acoustic properties and speech intelligibility tests conducted in 51 representative classrooms. After statistical analysis of test results, the index method was suggested for assessing acoustic quality. It involves determination of a single number-valued global index based on partial indices and comparison with developed assessment scale. The proposed method for evaluating the acoustic quality was applied in 9 additional classrooms diversified in terms of acoustics (including rooms with acoustic treatment). The data created a matrix of observation, which was used for detailed analysis of variables using the SVD. Based on that analysis, a computational model was developed for determining the global index for the acoustic quality of classrooms with incomplete information on partial indices. The developed computational model was compared with the regression model corresponding in terms of the number of variables. The simulation results demonstrated a more accurate prediction of the global index for the rooms tested when using the SVD.

The final part contains a discussion of results and conclusions. The method for assessing the acoustic quality of classrooms is a tool that can be used in the technical prevention. The use of this tool by architects, designers, or the health and safety of workers can improve the acoustic comfort to achieve optimal acoustics at the design and construction of new and modernization and renovation of existing spaces.