



Approaches to Measuring and Modelling School Education Quality: A Systematic Review

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A clear definition of 'quality of education' remains a challenge for researchers. Education quality encompasses multiple factors that must satisfy stakeholders, and it has been established that students, teachers, administrative staff, physical facilities and infrastructure, teaching, learning outcomes, and curricular and extracurricular activities are critical factors that guide students toward excellence. Educational quality can be considered in terms of efficiency, effectiveness, and equity. This study aimed to conduct a systematic review of quality education-related research. The research question examined the existing conditions for quality education as illustrated by previous studies, with special reference to quantitative studies. It is debatable whether prevailing indicators and modelling techniques are adaptable for multifaceted quantitative and qualitative approaches to measuring quality in education. In this study, a systematic review (SR) was carried out based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, considering 22 research articles published between 2000 and 2025 about composite index estimation for quality education, excluding non-English papers. As a composite indicator that evaluates multidimensional concepts into a single measure, the systematic literature review produced research trends, indicators, methods, and challenges for measuring educational quality in empirical estimations locally and internationally. Based on the results, Principal Component Analysis (PCA), multiplicative aggregation, Data Envelopment Analysis model, arithmetic averaging, normalization, weighted arithmetic mean, and correlation analysis through multi-criteria measurement and assessment of quality are popular in this field. Principal Component Analysis (PCA) is one leading method used to design a composite index and was later extended into Weighted Principal Component (WPC) analysis based on the dimensions of variables. The literature analysis highlights the importance of leveraging both quantitative and qualitative approaches in one measuring tool. Therefore, the Benefit of the Doubt (BoD) and virtual weighting, inter-transmission comparisons, and considering a quantitative approach would be ideal for designing a moderated composite index for quality education estimation.

Keywords: Quality of education, Systematic review, School education, Quantitative study, PRISMA method