THE EFFECTS OF DIFFERENT INSTRUCTIONAL METHODS ON STATISTICS ACHIEVEMENT: A META-ANALYSIS

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In 1967, the Joint Committee of the American Statistical Association and the National Council of Teachers of Mathematics on the Curriculum in Statistics and Probability was formed to plan and coordinate improvements in the science and teaching of statistics and probability at all levels of education. Since this time, the research on the teaching of statistics at the university level has advanced rapidly. To date, while many articles have been written detailing various resources available for those who teach in this field, no systematic review of the literature focusing on the effectiveness of various instructional approaches exists suggesting that a synthesis of the research is necessary The primary purpose of this study was to investigate the effect of various instructional approaches on student learning in statistics at the university level using meta-analytic procedures.

The average effect across all "innovative" instructional approaches, when compared to the traditional lecture approach, indicated these strategies influenced achievement in a positive manner (d = 0.3389). However, the effects was moderated by manuscript type (i.e., journal, presentation, dissertation), suggesting that a publication bias exists in this literature based on the finding that the average effect for published studies (d = 0.4235) was significantly greater than both presentations (d = 0.1515) and dissertations/theses (d = 0.1761). Two design features also moderated the effect of these instructional approaches. Experimental studies produced larger effects on average (d = 0.3615) than those which used intact groups (d = 0.2624) and those studies which controlled for the possible influence of history effects produced larger effects (d = 0.3324) than those which did not control for history effects (d = 0.1917).