

META-ANALYSIS OF THE EFFECTIVENESS OF COMPUTER-ASSISTED
INSTRUCTION IN TECHNICAL EDUCATION AND TRAINING

by

Mohammad Naim Yaakub

Committee Chairman: Professor Curtis R. Finch

(ABSTRACT)

The overall effectiveness of computer-assisted instruction (CAI) for higher order learning in technical education and training was determined through the meta-analysis approach. Studies that had investigated the effectiveness of CAI as compared to traditional instruction were selected from major databases in the civilian and military sectors: (a) National Technical Information Service (NTIS), (b) Defense Technical Information Center (DTIC), (c) Educational Resources Information Center (ERIC), and (d) Dissertation Abstracts International (DAI). The selection criteria were: (a) instruction was in the area of technical education and training, (b) a comparison was made between a group of students that received computer-assisted instruction with another group that was taught in the traditional manner, (c) student learning in both groups was measured in some form, and (d) quantitative results on criterion measures were provided. The common comparison metric chosen to indicate the effect size was the standardized mean difference. Additionally, a determination was made of the difference in CAI effectiveness between studies categorized into: (a) CAI type -- intelligent CAI and ordinary CAI; (b) nature of CAI treatment -- replacement and supplemental; (c) subject assignment -- random groups, intact groups, and assignments other than the preceding two groups; (d) educational level -- secondary / postsecondary, university, and adult military training; and (e) setting -- civilian and military. The overall effect size of CAI was found to be 0.35, implying that the average student in the traditional class would have improved from the 50th percentile to the 64th percentile if the student had been provided with CAI. Intelligent CAI was found to be significantly more effective than ordinary CAI.