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## A Preliminary Investigation into Critical Thinking Skills of Urban High School Students: Role of an IT/STEM Program

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### ABSTRACT

This paper reports the development of critical thinking of urban high school students in an IT/STEM program-using information technology (IT) within the context of science, technology, engineering, and mathematics (STEM). The study used a quasi-experimental time-series design, involving 47 initial participants in an eighteen-month intervention period. Data were collected from the Test of Everyday Reasoning (TER), which provides an overall score on critical thinking skill (CTS) and five sub-scale scores (analysis, inference, evaluation, inductive reasoning, and deductive reasoning). Findings indicate that based on a mean score of 15.77, the average participant scored between the 16th and 19th percentiles at the beginning of the program compared to an aggregated national sample. Participants who completed the program and responded to all three time-series TER tests (14) significantly improved their critical thinking skills throughout the program. Program completers' overall post-program CTS test score was more homogeneous than the pre-program scores with a 20.07 mean score. In addition, data showed significant improvement in inductive reasoning skills of the program participants during the first nine months with continuing improvement in the second nine months. In contrast, data presented improved inference skills during the first nine months with significant gains during the second half of the program. The study estimates the relative effects of IT/STEM experiences with technology-enhanced, inquiry and design-based collaborative learning strategies on CTS of urban high school students.

### KEYWORDS

Critical Thinking Skills; High School Students; Stem Education; Urban Education

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