

Does the ACE Teaching Cycle Affect Students' Attitudes and Motivation Towards Geometry?

Selda Özdişci¹, Süha Yılmaz²

Dokuz Eylül University/ Institute of Educational Sciences, Turkey

Abstract

This study investigates the potential impact of the APOS/ACE teaching cycle on middle school students' attitudes and motivation towards geometry. The participants of this study are 20 seventh-grade middle school students studying in a public school in Türkiye. APOS theory, which consists of the stages of Action, Process, Object, and Schema, provides a framework to analyze how students construct mathematical understanding. The instructional implementation was designed through the ACE teaching cycle—Activities, Class discussions, and Exercises—focusing on active, reflective, and collaborative learning. A quasi-experimental design was adopted, with data collected through validated instruments including the Attitude Scale Towards Geometry (ASTG) and Motivation Scale Towards Geometry (MSTG). The application process was conducted over 42 class hours within a six-week period. As data analysis is still ongoing, no definitive results are presented in this abstract. However, it is anticipated that the students exposed to the APOS/ACE treatment will demonstrate increased engagement, improved conceptual understanding, and enhanced attitudes and motivation towards geometry. The study is expected to contribute both theoretically and practically to the field of mathematics education by promoting constructivist approaches and offering insights into innovative instructional strategies theoretically and practically to the field of mathematics education by promoting constructivist approaches and offering insights into innovative instructional strategies.

Keywords: APOS Theory, class discussions, exercises, experimental design, middle school students