

**ZMATH 2016f.00576**

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**Employing intergroup competition in multitouch design-based learning to foster student engagement, learning achievement, and creativity.**

Comput. Educ. (Exeter) 103, 99-113 (2016).

Summary: This study developed an intergroup competition mechanism and integrated it into a multitouch platform for collaborative design-based learning (DBL) to enhance elementary school students' engagement, learning achievement, and creativity. A total of 58 elementary school students in 2 sixth-grade classes participated in the study over a period of 9 weeks. A quasi-experiment was conducted to examine the effects of the intergroup competition mechanism. The two classes were divided into an experimental group (a class of 28 students in collaboration with intergroup competition) and a comparison group (another class of 30 students in collaboration without intergroup competition), and the students in both groups were required to carry out a tessellation design project with their partners on the multitouch platform. Statistical analyses revealed that students under the intergroup competition condition had significantly better student engagement, learning achievement, and creativity than those under the no-competition condition. The results suggest that the computerized intergroup competition mechanism is effective in enhancing student engagement, learning achievement, and creativity. On the basis of the results, considerations in relation to the intergroup competition mechanism and the enhanced cognitive processes in multitouch DBL are discussed.

*Classification:* D40 U70 G90

*Keywords:* cooperative learning; collaborative learning; elementary education; improving classroom teaching; interactive learning environments; teaching strategies; learning strategies

doi:10.1016/j.compedu.2016.09.007