ABSTRACT

Fractions are crucial in learning mathematics because of their continuous use at every level of education. As in learning in general, learning fractions also has challenges and obstacles, namely natural number bias. With the advancement of technology today, one of the technologies used to support student learning in providing material or practice questions is an intelligent tutoring system (ITS). One of the tools that can be used to build ITS is Cognitive Tutor Authoring Tools (CTAT). CTAT allows the creation of a cognitive tutor with adaptive feedback to guide students to solve problems step by step. Some previous studies have tried to develop fraction math tutors built from scratch and math tutors for slot-filling problems developed with CTAT without feedback. This research attempts to develop a web-based cognitive tutor built with CTAT for learning multiplication and division of fractions. The result obtained is that learning by using math ITS can improve students' learning performance by 33.78% compared to traditional learning which increased by 13.25%. Meanwhile, in general, more than 60% of students who participated in using the ITS were satisfied with the system overall.

Keywords: *adaptive feedback, cognitive tutor, intelligent tutoring system, multiplication and division of fraction.*