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Producing Class Materials with KeTCindy — Programming Styles, Creating Portal Site and the Evaluation

To produce class materials with figures using TeX, the KeTpic Development Group (KDG), comprising S. Takato, the author and several Japanese mathematics education researchers, completed KeTpic in 2011 as a plug-in for the Scilab numerical analysis software package. KeTpic users produce KeTpic programs based on their original programming styles. This leads other KeTpic users to a shortcoming that renders it difficult to use their KeTpic programs. To resolve this situation, KDG developed the KeTpic programming style for drawings in 2013. KeTpic programs include three main parts. Since 2014, KDG has improved KeTCindy as a plug-in for an interactive geometry software Cinderella. Cinderella has two screens: the interactive geometric screen and a screen called Script Editors. When a KeTCindy command is run in Script Editors, the corresponding KeTpic commands are extracted to the proper position of the three parts in a Scilab executable file.

KDG produced the web site "Making of Teaching Materials with Figures by KeTCindy" which described the utilization of KeTCindy and examples of class materials produced by KeTCindy. This web site is convenient for mathematics teachers when they create an original class material by KeTCindy.

In order to evaluate the effect which these figures in mathematics class materials give on the understanding of the students, KDG developed CDC (Cognitive Detection Clicker) which records the students' answers in chronological order. When KDG carried out an experimental class using class materials produced by KeTCindy, the transition of students' answers was measured by CDC. The author introduces this measuring results.