

Educational graph creation tool based on the natural mathematical description

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In recent years, in the world including Japan, digital textbooks have been introduced into school education. Therefore, in mathematics education, it is important a tool enable students to create a graph easily on a digital device. However, the procedure to input the equation to define a graph by the existing current tool is still unnatural and troublesome for novice students. To address this shortcoming, we proposed an intelligent mathematical input interface, named MathTOUCH, in terms of predictive conversion from a colloquial style mathematical text using an AI in 2015 [1]. And in 2019, we have previously proposed a graph creation tool within the features [2]; 1st: it is implemented MathTOUCH, 2nd: it is enable us to create a graph based on the natural mathematical description, 3rd: to print a mathematical expression in the graph screen, 4th: to plot a point of ordered pair defined by a mathematical equation. However, this tool was based on a mathematics description only in Japanese not many national language. In addition, users had to switch the windows between the one editing the equation for a graph and the other of the graph main tool. In this study, we have improve the graph creation tool based on the natural mathematical description in English in addition to in Japanese and implemented MathTOUCH into the same window of this main tool as in an inline text. For example, the description to graph the equation $y = \sin^2 x$ is denoted by “graph of the equation $y = \sin^2 x$ ” and for the case to plot the peak point on the graph by “point $(\frac{\pi}{2}, 1)$ ”. To investigate the effectiveness of this tool, we conducted a graph learning experiment by students in our University. The result showed that many students had high satisfaction for this tool.

Keywords

Graph, Equation, Mathematical input interface

References

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