



POKVARJENO ŽEPNO RAČUNALO KOT KATALIZATOR PRI POUČEVANJU ZGODNJE MATEMATIKE

TEACHING ELEMENTARY MATHEMATICS WITH BROKEN CALCULATOR AS CATALYST

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Povzetek

V prispevku podamo izsledke nekaterih tujih in domačih raziskav o uporabi računalna na nižjih stopnjah izobraževanja. Ustavimo se ob različnih mitih, ki uporabo tega pripomočka omejujejo in predlagamo korak naprej v slovenskem šolskem prostoru. Prikažemo uporabo žepnega računalna kot kognitivnega orodja, ki katalizira ojačenje in reorganizacijo mentalnih shem. Osredotočimo se na aktivnosti, poimenovane Zlomljena tipka, ki jih omogoča ali fizično žepno računalno ali tudi spletna aplikacija Broken Calculator združenja National Council of Teachers of Mathematics. Program ponuja primer učinkovite pedagoške strategije, ki razvija relacijsko oz. povezovalno razumevanje: če želimo preveriti, kako dobro nekdo razume množico orodij (v tem primeru števila in operacije), mu onemogočimo uporabo nekaterih orodij in ga izzovemo k uporabi ostalih v reševanju neke naloge. Podana je tudi analiza uspešnosti izvajanja predlaganih aktivnosti na manjšem vzorcu učencev razredne stopnje. Empirični rezultati so pokazali, da so učenci, ki so v tem procesu uporabljali žepno računalno, v povprečju dosegli za petino boljše znanje. Kljub temu se je pokazalo, da jim manjkajo nekatere spretnosti, ki jih lahko pridobijo le z uporabo žepnega računalna.

Abstract



Some study researches originating abroad and one Slovenian study focusing on calculators at primary educational levels are provided. Myths narrowing educational purposes of calculators are addressed and step forward in this direction is proposed. This paper examines the idea that the arithmetic calculator can act as a cognitive tool, supporting the amplification or reorganization of systems of thought. In the spotlight of this article are activities Disabled keys, which can be done via physical calculators or internet application offered by National Council of Teachers of Mathematics. Application Broken Calculator offers an example of an effective pedagogic strategy, developing powerful or relational understanding: to gauge how well someone understands the use of a set of tools (in this case numbers and operations), we shall make the use of some of the tools impossible and challenge them to use the remaining ones to accomplish the task at hand. Results of pedagogical experiment on smaller sample of primary level students are analyzed. Empirical results showed approximately 20% better knowledge at students who used calculators. However, most of the students exhibited lack of cognitive or meta-cognitive knowledge necessary for efficient use of calculators.