

FACULTY DEVELOPMENT ENDOWMENT FUNDS

Faculty Research Fund

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Proposal Title: Rethinking a Teaching Method for Programming Languages in STEM Education.

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ABSTRACT

A Teaching programming languages is generally based on instructor's experiences or discretion, rather than objective data or information so finding a better teaching method may be a trite remark. However, as the analysis with A-State students' data, the PI has found out that it is very important for computer science students to learn a programming language class for their future career as well as their advanced classes. As a matter of fact, our community has endeavored to improve teaching methods of programming languages in multidisciplinary approaches. The PI believes there are at least two key features of teaching programming languages that can be exploited to improve a teaching method in the future. The first is usability; a programming language may have core and popular language features. Core language features and popular (most used) language features should be taught preferentially at the beginner's level. The second is learnability; a programming language may have difficult language features for learning and/or teaching. Difficult language features should be taught at the advanced level which may need different teaching methods. The PI will take two approaches to find out usability and learnability for each programming language feature. For usability, the PI will implement a programming language analysis tool to extract programming language features. For learnability, the PI will build a novel model to estimate LOD (Level of Difficulty). Throughout this project, the PI aims to produce objective data to categorize programming language features according to the degree of usability and learnability. The results will be utilized to devise a specific teaching method of each programming language feature for future research.