**Analysis of Research in Programming Teaching Tools: An Initial Review**

Electronic tools are essential since programming software and environment are closely related to and require computer as a platform to implement and test the syntax of programming.

Programming process involves a combination of activities i.e. planning, designing, testing and debugging. To learn on how to develop a program, students need to understand the syntax of programming language.

Various learning strategies such as storytelling, games in learning approaches, simulation and visualization techniques as well as pair-programming approaches are implemented to enhance student engagement and to develop creative thinking as one of the preparation strategy for students to become future producers, not just consumers of technology

Programming consists of three main components: program, programming tools and programming language. As one of the key elements in programming, programming tools play an important role in programming development and implementation. Programming tools provide the software or environment that allows programmers to give instructions, test them and implement the program. Ability and skills to use programming tools are considered as important and equivalent to skills in syntax and logic

Program software developers are generally designed to meet the needs of professional and advance programmers. Usually, the software is equipped with complete set of concepts and complex functions. Due to limited experience and knowledge among novice programmers, it is very difficult for them to understand and use the functions. As a result, these complex functions are perceived as problem rather than solution that help them in producing program.

complexity in software interface, difficulty to understand error messages display and warning messages are among the reasons why most programming tools are not suitable for the programming learning environment (Arnold et al, 2007)

The results show that the use of various software tools help student to program. Based on good performance positive response from student, there is evidence that the tools are accepted in the learning process (Orni et al, 2010, Reginamary et al, 2009, Fatima AlShamsi and Ashraf Elnagar, 2009, Ana Paula et al, 2010, Georgios Fesakis & Kiriaki Serafeim, 2009 ). Besides, tool support from technology and peer-learning are important in helping students to understand programming concept (Davor ubrani et al, 2006 ).

Programming tools using visualization approach were found to be preferred by students (N. Baloian et al, 2005 and Susan H. Rodger et al, 2009). Meanwhile, game element makes learning programming more interesting to follow (Martinha Piteira & Samir R. Haddad, 2011 and Mary Flanagan et al, 2005). Programming animation and online application were among innovative element in the research (Jungsoon et al,2006).

This study focuses on programming teaching tool and uses review analysis to determine important issues raised by recent research conducted on this topic. The findings are based on four research questions. They indicate prominent issues addressed by researchers such as the techniques and methods of programming teaching, learning and assessment. These findings are useful for researchers to continue research in programming teaching tools in regard to this aspect.