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Enhancing the teaching and learning of programming functions and procedures using legitimate code theory

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Abstract

Learners in high schools find programming difficult especially the concepts of functions and procedures since these concepts are covered at the very beginning of the subject, the challenge begins in Grade 10 and escalates to further grades and tertiary education which results to learners drop out in the specific subject and opting for more flexibles subject such as Computer Applications Technology (CAT). The Research showed that factors that contribute to this challenge ranges from inappropriate teaching methods used by educators to inability to follow appropriate or correct syntax when coding by learners. In addition, the research revealed that there is confusion of differentiating between functions and procedures by learners due to the technicality of the language used in learner and teacher resources such as textbooks. The main contributing reason seems to be a lack of teacher development in programming to help guide and equip teachers with skills that may provide them with knowledge to teach programming in the information technology topic at a level that is more understandable to learners. This study aims to unpack the mingling of functions and procedures settings and repack distinct settings by going from simpler meanings [concrete] to complex meanings [abstract] using the semantic wave construct of the Legitimation Code Theory (LCT). Semi-structured interviews were conducted with participants (Information Technology teachers) teaching programming languages of either Java or Delphi in grade 10. Four participants were interviewed and responded to all questions asked. The results showed that improper use of code syntax results in failure to execute running codes and the need for IT teacher's professional growth. The research indicated that teacher's poor selection of teaching methodologies as well as the dominance of technical language used when teaching learners as well as contained in learner's learning resources such as textbooks are the two main reasons learners mingle the notion of functions and procedures. Thus, there is a need to uncover what the suitable teaching methodologies are for teaching programming concepts such as functions and procedures. In addition, extensive use of the LCT to unpack not only functions and procedures but all complex concepts in programming, ranging from the way teachers structure their teaching instructions to structuring activity question, assignments, or tests. The study recommended that IT educators employ the idea of LCT's semantic waves to break down technical language to a level that learners could understand without losing the concepts' original meaning.

Key words: Information Technology (IT), Functions, Procedures, Legitimate Code Theory, Semantic Waves.