RESEARCH AREA

~EDUCATION~

- EDUCATIONAL TECHNOLOGY FOR MOTIVATING LEARNERS
“AN EXPLORATORY INVESTIGATION OF THE EMERGENT REQUIREMENTS FOR VISUAL TEACHING TOOLS FOR SUPPORTING INTRODUCTORY PROGRAMMING IN C SHARP: A CASE STUDY OF BOTHO COLLEGE, FRANCISTOWN”
AUTHORS

- Bonolo Samson-Zulu
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Teaching approach adopted where there is lack of engagement from students,
Preconceived views that programming is difficult by learners and,
Lack of prerequisite knowledge amongst learners required for learning introductory programming.

**Literature**
## MIS Statistics

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<th>TOTAL</th>
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<td>Jul 12</td>
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Students specialization table (Botho College, Francistown)

Line graph of student specialization (Botho College, Francistown)
RELATED LITERATURE

- Coull & Duncan, 2011
- Myungsook, 2006
- Ronit, et al., 2003

- Requirements
From: University of Abertay Dundee, School of Computing and Engineering.

Contribution: Investigated the problems associated with teaching novice programmers. Identified a number of visual tools developed. Developed Snoopie, a visual tool for teaching novices.

Conclusion: in the experiment, they observed that:
Student confidence improved,
Students perceived the tools as adding value,
Students were able to solve problems faster than without the tool,
Students were able to produce solutions faster.

RELATED LITERATURE
Myungsook, 2006

- **From:** California Lutheran University – Computer Science Department.

- **Research:** Investigated the impact of Alice visual support tool in being used to support novice programmers.

- **Findings:** Alice improved students’ confidence and perception about programming because it was easier for them to deal with syntax, objects, and constructs.
Innovation: Jeliot 2000 program animation.
Visualisation of Java program.
From the analysis of the literature, consideration of the current learners’ models and the review of the emergent visual tools for teaching programming, we:

1. found that novice programmers find the visual tools very handy and supportive in the learning process.
2. Therefore strongly support the use and development of an ultimate visual support tool for C# and
3. propose following core requirements for the visual tools;
Requirement 1: Visual/Tracable

The tool should animate the execution of each line of code in a program so that the students can be able to understand program logic and be able to trace in the case where it is not presenting desired output where exactly its having a problem.
Requirement 2: Supplementary Error Messages

The current IDE used being Visual Studio.Net does present complex error messages that novice programmers will usually not be able to interpret and understand. Therefore, we propose that these error messages should be supplemented with descriptive messages that novice would be able to interpret.
Requirement 3: **Feedback Should be Aligned to the syllabus**

The supplementary messages that we proposed to be used, should be compiled aligned to the content of the syllabus such that students can relate the concepts learned in class to the programs they will be writing.
Requirement 4: *Regressive Use Of Tools*

- The support tools recommended here are for assisting novices.
- Researchers would like the students to learn programming progressively and move from being novice to expert programmers.
THE FRAMEWORK FOR THE VISUAL TOOLS DESIGN

- The requirements for visual support tools discussed above can be integrated to form a solid framework or foundation from which we can determine the ideal properties of the future visual support tools designed to support the learning process for introducing programming.
Diagram that captures core requirements of ultimate support tool
The researchers propose further research or recommendations in the following areas:

1) Learning/teaching models in support visual support tools.
2) Problems causing high attrition rates at Botho College.
CONCLUSION

- Learners’ perceive programming as a difficult, course,
- we need to find ways in which we can encourage our students to like it.
- The researchers find it really suiting to use of a visual support tool in learning and teaching of introductory programming as it will assist students in learning programming and hopeful cultivate students’ interest on the course.
- Our students have weak programming backgrounds therefore, therefore,
  1. customized ultimate visual support tool for Botho students,
  2. Make a fitting learning/teaching model for the purpose.