Paper Summary

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I. Paper Citation Information

- Using interactive multi-media for teaching and learning object oriented software design [1]
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II. Summary

A. Problem Statement

Many first year students are exposed to programming for the first time. Programming is an abstract concept and students who are introduced to it for the first time have difficulties understanding it. Universities use verbal mode to teach programming and explaining programming concepts verbally is difficult. These difficulties discourage students to continuing studying programming. This difficulty was observed in several Universities in UK. The paper deals with the methods to improve teaching of programming concepts using multi-media techniques.

B. Proposed Solution

The paper first tries to understand what learning is and based on this it builds its solution. It believes reasoning and reflection to be important part of learning. Actual learning happens when students reason about what they have learned and then use it to do something constructive with their current knowledge. They refer the Maye's learning framework, into three steps. The first is conceptualization, where a student is exposed to knowledge. This is followed by construction, where use of knowledge gained during conceptualization is used. The third and final step is dialogue, where the student refines his knowledge through dialogue and discussion. Fowler and Mayes modify Maye's framework to add dialogue at every stage of learning. They introduce clarification and confirmation during conceptualization, collaboration during construction phase and identification during dialogue.

The paper makes use of these definitions to design its solution that uses multimedia. It uses multimedia like video sound and animation to enhance the experience of learning. One of the problems with traditional approach was, presenting information in one format, i.e verbal, now using multimedia, they can present information in more than one format, allowing them to explain the concepts better. They can now use simulation and visualization to explain the abstract concepts better, which cannot be explained verbally. Their solution basically has two parts. The first one was a resource based material that can be used in the conceptualization stage, when the student in trying to learn the concept. The next stage is task-based solution, that can be used by the user during construction stage of learning.

C. Results

To test test their application, the asked a bunch of students in the university to use it. The multimedia solution helped students at Brunel and Napier to learn programming. They found students, with prior knowledge of multimedia were able to better use the solution and hence, learn programming better. Prior perception of what multi-media is effected the way the tool was used by the instructors. The perception

among instructors was that a multi-media tool was something independent and students would be able to learn it themselves. On the negative side they found out that some students were afraid to try anything new with it and felt that the tool wasn't assisting them but increasing their workload. But, they observed that, with time users got used to these solutions and started liking it better. They were happy with visualization, since it helped them understand abstract concepts better. By the end of their study they found that 71% of students at Brunel and 93% of students at Napier gave positive review for their solution.

III. Critique

A. Strenghts

The problem of building tools to improve learning process is very interesting. They identify the difficulties students face with learning, identify techniques that can help learning and build solution according to those techniques. Hence, the problem and the techniques used to solve the problem are relevant.
The results show that students though initially found difficult to use the solution, they eventually liked it. It shows the their solution met its intended goal.

B. Weakness

One of the places that, I thought, the paper could improve was in their experimental setup. The data-set that the paper uses to test its results are not very diverse. The size of the data-set is small compared to many actual social networks. Hence, testing their results on these larger graphs might have helped us understanding their techniques better.

IV. Future work

The paper could improve in their implementation details. They don't explain the details of their implementation, like the tools they used, the architecture of the solution etc. Giving those details would have made their solution much more clear.

References

[1] S.-H. Choi and S. Cairncross, "Using interactive multimedia for teaching and learning object oriented software design (poster session)," in *Proceedings of the 6th annual conference on Innovation and technology in computer science education*, ser. ITiCSE '01. New York, NY, USA: ACM, 2001, pp. 176–. [Online]. Available: http://doi.acm.org/10.1145/377435.377687