REPORT ON GAMIFICATION

CAP707 – PAPER WRITING-II

On

Gamification:: Why learning a computer programming is always challenging to a student?

Submitted By –

Agresh Pandey (11401062)

Tanishka Bist (11400985)

Varsha Rathour (11400978)

CERTIFICATE

This is to certify that Tanishka Bist, Varsha Rathour and Agresh Pandey are working on research paper titled **"Gamification"** under my guidance and supervision. To the best of my knowledge, the present work is the result of her original investigation and study. No part of the research has ever been submitted for any other degree.

The research is fit for the submission and the partial fulfilment of the conditions for the award of Master of Computer Applications.

Date: 29-04-2015

Mr Parul Khurana (Mentor)

Assistant Professor

School of Computer Applications

Lovely Professional University, Phagwara, Punjab, India

DECLARATION

We hereby declare that the research entitled, **"**Gamification", submitted for the MCA Degree is entirely my original work and all ideas and references have been duly acknowledged. It does not contain any work for the award of any other degree.

Date: 29-04-2015

Name	Reg No.	Program
Agresh Pandey	11401062	MCA
Tanishka Bist	11400985	MCA
Varsha Rathour	11400978	MCA

ACKNOWEDGEMENT

I wish to thank many people who helped and supported us during the project. Our deepest thanks to **Mr. Parul Khurana** the advisor of this project for guiding and correcting various documents of us with attention and care. He has assisted us throughout the project by his valuable comments on our work regularly and making necessary correction as and when needed. His encouragement and support has made us for continuous progress in the work and completing the project on time.

We also extend our heartfelt thanks to our family and well-wishers who supported mentally for completing this project.

Lastly, we offer our regards to all of those who supported us in any respect during the completion of the project.

Date: 29-04-2015

Name	Reg No.	Program
Agresh Pandey	11401062	MCA
Tanishka Bist	11400985	MCA
Varsha Rathour	11400978	MCA

a

INDEX

ABSTRACT

Teaching and learning programming language is one of the greatest challenges in the field of computer education. So in such manner a study is directed for examining challenges concerned with programming languages that why it is so difficult for an individual who is undergoing studies at UG or PG Level.

The survey has been done and information is gathered from a bunch of Computer application students those are doing post-graduation and the respondents have said programming troubles at different granularities and levels. It has been further watched that students have cognitive challenges at different levels in programming courses.

In the event that the cognitive prerequisites for a programming language are beyond the cognitive attributes of programming students, the students may lose their minds. On the off chance that the cognitive necessities are under the student's cognitive qualities students may be exhausted. And if it is according to them, the students have the capacity to meet the difficulties as well. Inspiration, interest, respect toward oneself and achievement might therefore be streamlined in the process.

1. Introduction

Computer language is a procedure of composing, testing and troubleshooting of PC programs by using distinctive programming languages. Regarding this, a developer or a programmer should know well knowledge of programming so computer programming is a bit difficult task and also needs multi-skills and knowledge as well. Many of the publications in computer programming describes that the rate of failure is relatively high than the success rate and the overall effectiveness of the result is not up to the mark.

Teachers are also having some problem to design a good structure for the computer programming courses so that it would be very efficient and effective for a group of understudies.

For finding and for analyzing the effectiveness ,a survey(questionnaire) was made with relevant questions and distribute among the students those are doing post-graduation in the field of computer programming. The analysis of data shows that, the cognitive problem dominates every other problem. The study of this survey provides the starting point for further research on programming and some guidelines to improve the education in the field of computer programming.

2. Literature review

Learning and teaching the programming language is included as one of the biggest challenges in the field of computer education. The reviews and the research have been going to improve the efficiency of the programming language, but the results are not accepted globally.

By the number of literatures, it is concluded that some main resources for beginners to learn the computer language are:

1. Teaching in classrooms
2. Laboratory(use of computers)
3. Text book learning

While teaching in classrooms; instructors spends most of time in teaching the language and gets very less time to do the actual practice of programming language. By this strategy, a big problem arises; students those are having good ability and logical mindsets may get survive but on the other hand; students find it very difficult to fill the gap between program constructs and language construction.

3. Methodology

Information obtaining and examining can be done in different ways based on the trade-off between the preciseness of results and the cost of resources. Survey will be an monetary route to gather information from a generally substantial bunch of respondents. The dependability of the information depends for the most part on the survey quality and nature of its administrators who takes survey.

3.1 Design of Questionnaire

Arrangements of rules were followed to plan the survey. So as to make it substantial, it ought to address the objectives of the study accurately. The fundamental factor to the education of programming was distinguished and questions were encircled based on these factors. Some of the variables considered were:

- Cognitive difficulties of students

- Student's assessment of quality of teaching

- Interest in programming

- Approach in programming course

4. Analysis

The different information gathered are displayed properly in distinctive graphical structures like bar-diagram and the observation made.
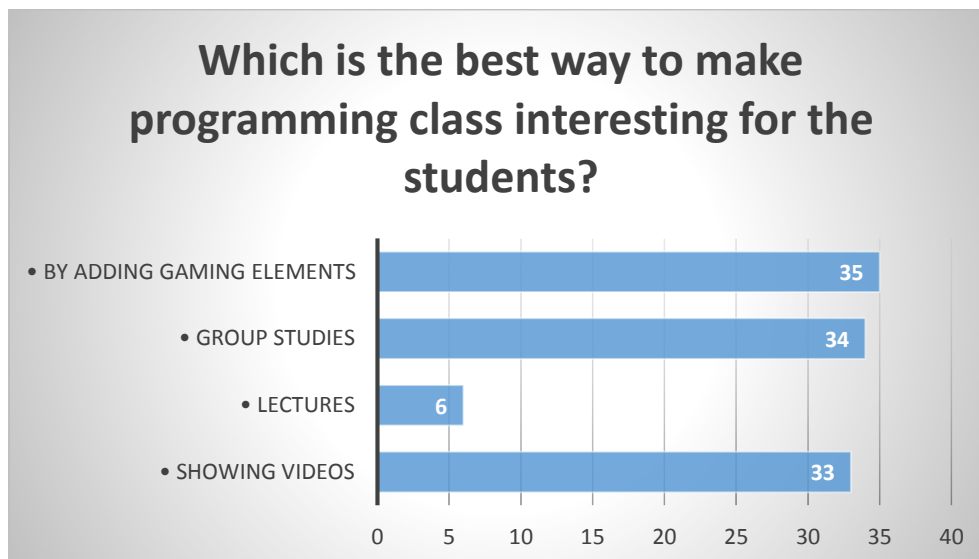
4.1 Programming difficulties

Review respondents were requested that rundown challenges they confronted amid programming. Since the question was in open format, a wide assortment of challenges they experienced amid writing computer programs were recorded and listed as below:

   i.   How to start
  ii.   Syntax related
 iii.   Lack of knowledge
  iv.   Logic related
   v.   Teaching related
  vi.   Programming type

4.2 Teaching analysis

This indicate the expectations that if these could be the options available by the students. They can do much better and learn programming efficiently.

Some questions have been asked to the student that in what way they want the teacher should teach them i.e. what is the expected pedagogy?

Which is the best way to make programming class interesting for the students?

Option	Value
• BY ADDING GAMING ELEMENTS	35
• GROUP STUDIES	34
• LECTURES	6
• SHOWING VIDEOS	33

It is observed that the majority of the respondent (32.4%) think that gamify the programming language can be a good idea and (31.4%) of students want group study to make their interest in programming and others (30.5%) think videos are good option to make interest and very less(5.55%) students selected the traditional approach i.e. lectures

Which is the best way you would like teacher to adapt while teaching programming?

| Category	Value
• READING A BOOK IN CLASS	3
• MARKER AND BOARD	31
• AUDIO/VIDEOS WITH PROJECTOR	55
• PRESENTATION	18
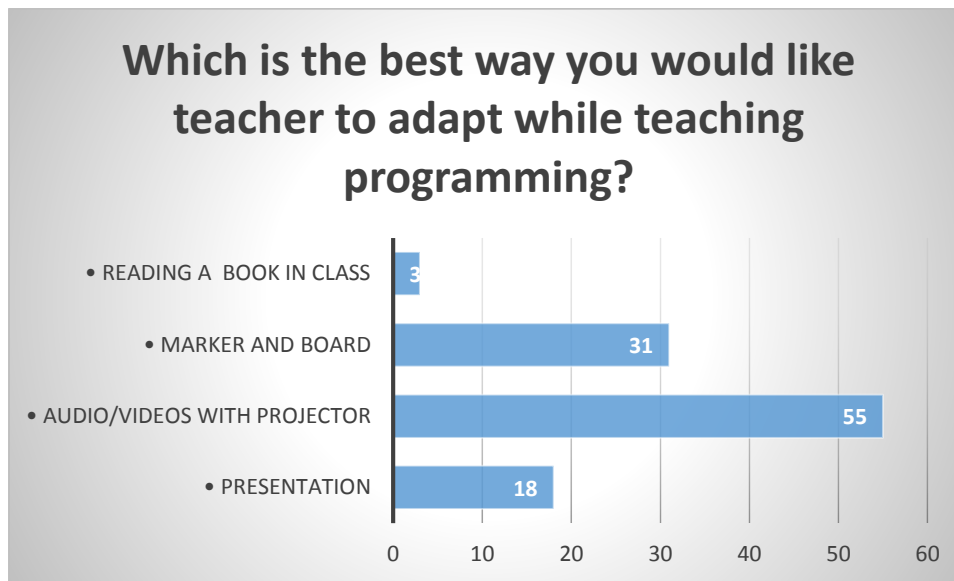
In this question, we focused on the teaching style/pedagogy, that student think teacher should follow while taking lectures. So the result was concluded and it is found that majority of the student (50.9%) wants the use of projectors while delivering the lectures in the class. After use of marker and board (28.7%) was ticked by the student as they want teachers to teach on the board procedure wise but some students (16.6%) wants to give the presentation be a good idea and vess less(2.77%) ticked for reading books will be better.

4.3 Student challenges

The graphs given below are the graphs that are mentioning that what problem students always face when they do the computer program or when they learn any computer language .

Most of the question asked to them were direct having yes or no options that they ticked on.

Do you think learning a programming is really challenging task?
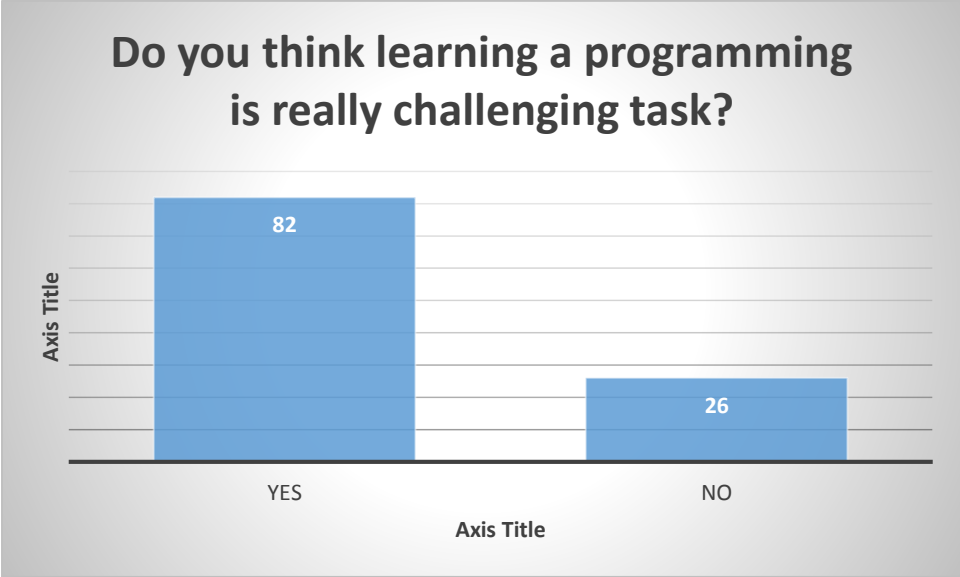
So this was the direct question that was asked to the students of computer application students that are doing post-graduation. What do they think: is programming language is really tough?
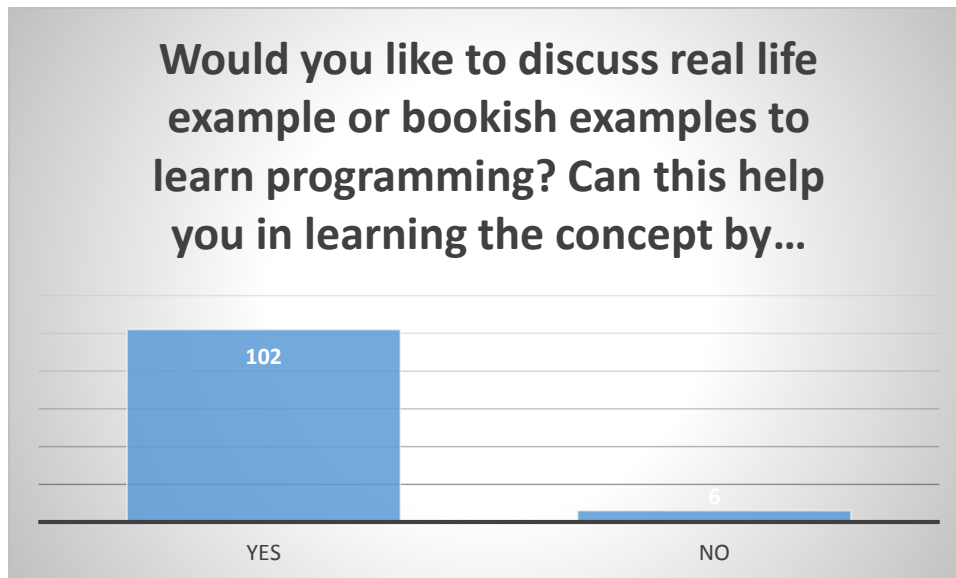
And the answer were given by the students and the maximum number of student were agreed to the question (75.9%) that yes they find programming tough.

And very less (24.1%) was stated that they don't find any difficulties while doing programming.

Would you like more labs than attending lecture if yes specify the number per week?
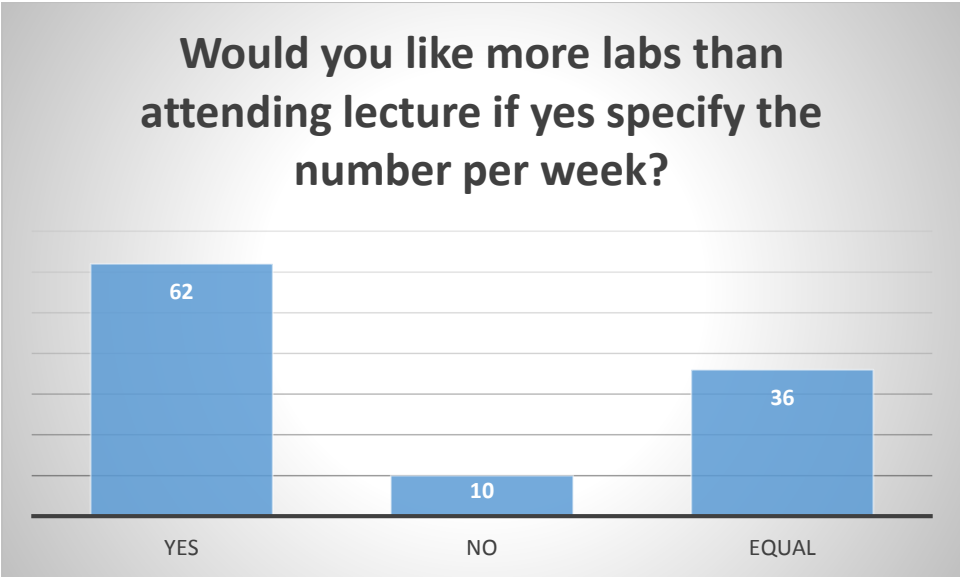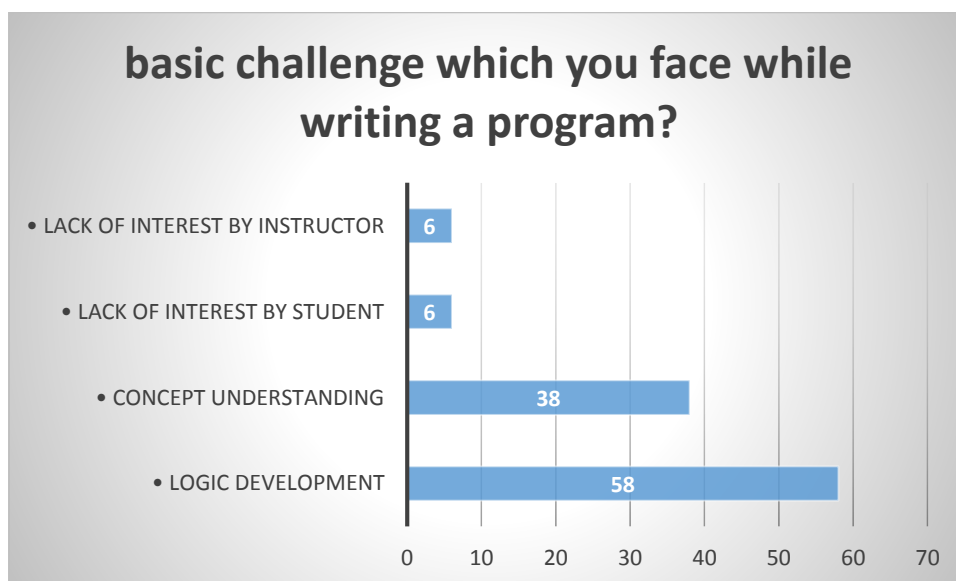
Students were asked the question, would it be more beneficial if labs were taken more than theory. And the answer given by the students were expected as maximum number of student wants more lab(57.4%) than the theory and some of them want the equal number of classes should be

regulated(33.3%) and very less(9.25%) were stated that there should more theory than the programming.

Would you like to discuss real life example or bookish examples to learn programming? Can this help you in learning the concept by…
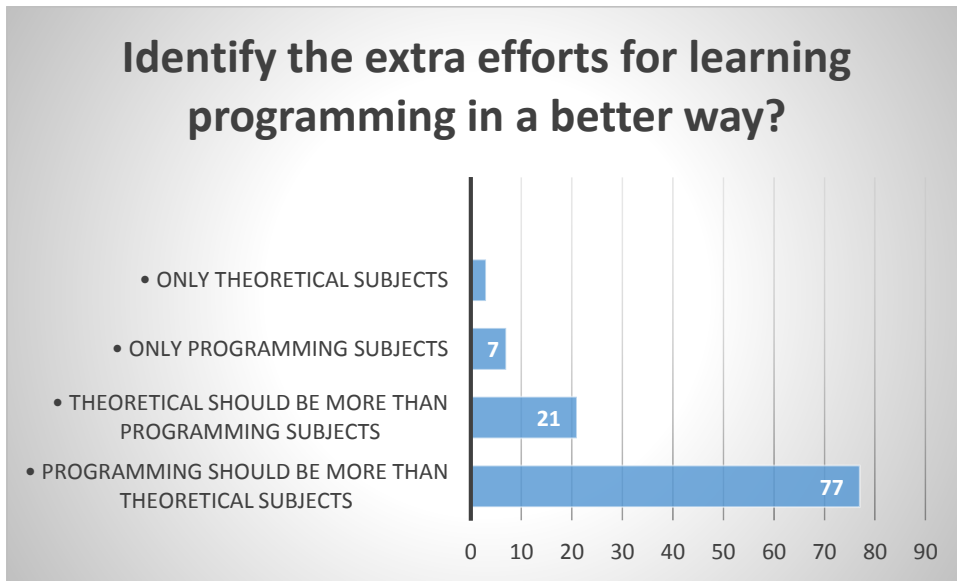
YES	102
NO	6

The question stated above is that if real life example should be given while learning programming and the results was calculated and found that almost every student (94.4%) want that yes the real life example should be given and the negligible(5.6%) were said no.

basic challenge which you face while writing a program?

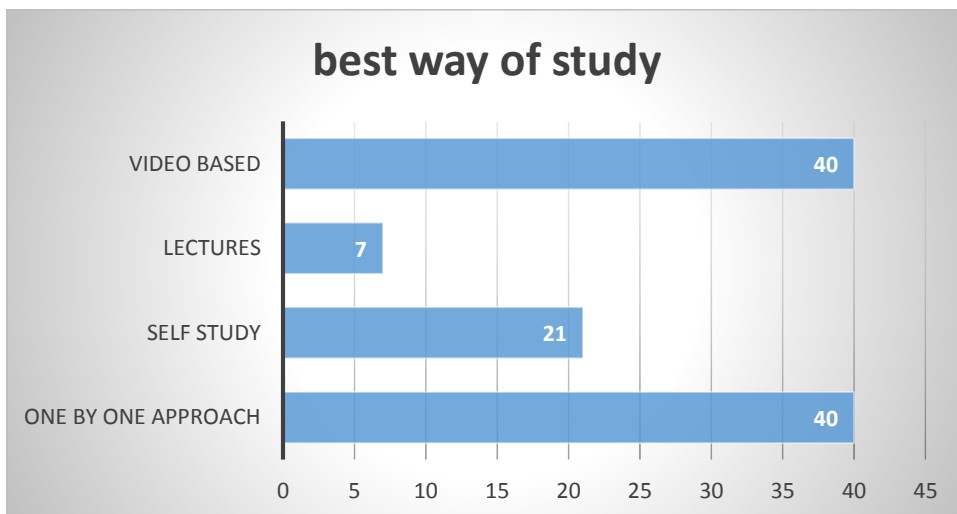|	
• LACK OF INTEREST BY INSTRUCTOR	6
• LACK OF INTEREST BY STUDENT	6
• CONCEPT UNDERSTANDING	38
• LOGIC DEVELOPMENT	58

0   10   20   30   40   50   60   70

In this question, students were asked that what will your first problem that you faced while doing the programming.

And the results were found again as expected. as maximum number of student faced a problem in logic building(53.7%) while doing programming and the other major issue that they found is in concepts. Students were find difficulty in understanding the basic concepts (35.1%) of the programming and very few were said that they don't find interesting and it's because of instructors and lack of interest in themselves i.e. (5.5%).

Identify the extra efforts for learning programming in a better way?

Category	Value
• ONLY THEORETICAL SUBJECTS	
• ONLY PROGRAMMING SUBJECTS	7
• THEORETICAL SHOULD BE MORE THAN PROGRAMMING SUBJECTS	21
• PROGRAMMING SHOULD BE MORE THAN THEORETICAL SUBJECTS	77

The survey that has been done and we found that maximum number of student(71.2%) were selected the option in which they want that programming should be more than theory. So it is concluded that the labs in which students do or implement the programming should be more rather studying and learning by the lectures i.e. (19.4%). Only programming subjects selected by 6.48% students and 2.7% selected only for theory subjects.

best way of study

Category	Value
VIDEO BASED	40
LECTURES	7
SELF STUDY	21
ONE BY ONE APPROACH	40

We asked a question to the students that what is the best way of study and the solution drawn was students want teachers to approach on by one to the students and also want to make them video based learning i.e. (37%) and some says they find self-study more good i.e. (19.4%)

And least were said that lectures are the best way of study and learning programming. i.e. (6.48%).

5. Proposed Implementation:

The core parts of programming language should be well understood, but still there are number of issues where there is no consensus. The issues being discussed in this paper are logical problem, logic development, concept understanding, lack of interest by student, lack of interest by instructor.

We can overcome with these problems of students by teaching program in gamified manner rather than showing PPTs, white board teaching and bookish learning. To implement this teacher has to make environment of classroom more interactive, so that students show there more interest in programming classes and number of students will engage in programming classes. Gamified manner here means by adding gaming elements while teaching. Because now a days student are indulging more in gadgets and they usually spend their most of the time in playing game and they take more interest in these kind of games then their books.

6. Conclusion

So as to research on issues with program learning, this paper investigated different information gathered from a gathering of computer application students those are doing post-graduation. This study demonstrates that understudies have psychological troubles at different levels, amid programming. The recent classification has a higher inclination for companion coaching alongside classroom, lab and course books. Along these lines, unequivocal center and psychological backing is required to empower the incapable understudies to learn programming. we should enhance success rate and not the disappointment in programming courses, which in turn will produce poor quality of developers later on. A deep study is expected as a research to make programming courses more interesting and pleasant.

7. Reference:

[1] J. Bennedsen, M.E Caspersen, "Exposing the Programming Process", Proceedings of the 36 th SIGCSE Technical Symposium on Computer Science Education, p 186-190, Feb 2005.

[2] B.S. Bloom et al., "Taxonomy of Educational Objectives – The classification of Educational Goals" Handbook I: Cognitive Domain, David McKay, New York 1956.

[3] M. Butler, M. Morgan, "Learning challenges faced by novice programming students studying high level and low feedback concepts", Proceedings of Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) Singapore, 2007.

[4] W.Campbell, E.Bolker, "Teaching Programming by Immersion, Reading and Writing", 32nd ASEE/IEEE Frontiers in Education Conference, Nov. 2002.

[5] M.E. Caspersen, J. Bennedsen, "Instructional Design of a Programming Course – A Learning Theoretic Approach", Workshop on International computing Education Research, Sep 2007.

[6] J.M. Corbin, A.L. Strauss, "Basics of Qualitative Research", 3rd Ed., Sage Publications Ltd., U.K., 2008.

[7] V. Dagiene, J. Skupiene, "Learning by Competitions: Olympiads in Informatics as a Tool for Training HighGrade Skills in Programming", 2nd International Conference on I.T.: Research and Education, Jul 2004.

[8] Y. Gael, "A theory of Program Comprehension: Joining Vision Science and Program comprehension", GEODES, University of Montreal, Dec 2005.

[9] S. Garner, P. Haden, A. Robins, "My Program is correct But it Doesn't Run: A Preliminary Investigation of Novice Programmers' Problems", Australasian Computing Education conference, 2005.

[10] D. Gries, "What Have We Not Learned about Teaching Programming?", IEEE Computer, Vol. 39, 2006.

[11] E. Lahtinen et al. "A Study of the Difficulties of Novice Programmers", Proceedings of the 10th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE) , Portugal, 2005.

[12] M.C. Linn, M.J. Clancy, "Can experts' explanations help students develop program design skills?", Int. Journal on Man-Machine Studies, Vol. 36, 1992.

[13] R.Lister, J. Leaney, "First Year Programming: Let All the Flowers Bloom", 5

Th Australasian Computing Education conference, 2003.

[14] A. McGettrick et al, "Grand challenges in Computing: Education – A Summary", The Computer Journal Vol. 48, 2005.

[15] I. Milne, G. Rowe, "Difficulties in Learning and Teaching Programming – Views of Students and Tutors", Journal of Education and Information Technologies 7:1, 55-66, 2002.

[16] A. Robins et al., "Learning and Teaching Programming: A Review and Discussion", Computer Science Education Journal, Vol. 13, 2003.

[17] M. Shaw, "Software Engineering Education: A Roadmap", Proceedings of 22n

International Conference on Software Engineering, 2000.

[18] B. Shneiderman, "Cognitive Psychology and Programming Language Design" ACM SIGPLAN, Jul 1975.

[19] G.L. White, M.P. Sivitanides, "A Theory of the Relationships between Cognitive Requirements of Computer Programming Languages and Programmers' Cognitive Characteristics", Journal of Information Systems Education, Vol. 13(1), 2002.

[20] L.E. Winslow, "Programming Pedagogy - A Psychological Overview", SIGCSE Bulletin, Vol. 28, Sep 1996.