CS555: Agile Methods for Software Development
Homework 05

1. **Question 1**: Search for evidence that pair programming is better or worse for software development than traditional individual programming.

Answer

1. Are Two Heads Better than One for Software Development? The Productivity Paradox of Pair Programming
    1. Name(s) of Authors: VenuGopal Balijepally, RadhaKanta Mahapatra, Sridhar Nerur and Kenneth H. Price
    2. Place of Publication: Management Information Systems Research Center, University of Minnesota
    3. Volume and Number: MIS Quarterly Vol. 33 No. 1
    4. Page Numbers: 91-118
    5. Date of Publication: March 2009

2. A Comparison of Pair Versus Solo Programming Under Different Objectives: An Analytical Approach
    1. Name(s) of Authors: Milind Dawande, Monica Johar, Subodha Kumar, Vijay S. Mookerjee
    2. Place of Publication: Institute for Operations Research and the Management Sciences (INFORMS)
    3. Volume and Number: Vol. 19, No 1
    4. Page Numbers: 71-92
    5. Date of Publication: March 2008

3. The costs and benefits of pair programming
    1. Name(s) of Authors: Alistair Cockburn, Laurie Williams
    2. Place of Publication: Addison-Wesley Longman Publishing Co., Inc., MA
    3. Volume and Number: Book Extreme programming examined
    4. Page Numbers: 223-243
    5. Date of Publication: 2001

4. Pair Programming vs. Solo Programming: What Do We Know After 15 Years of Research?
    1. Name(s) of Authors: Carolina Alves de Lima Salge, Nicholas Berente
    2. Place of Publication: IEEE, System Sciences (HICSS), 2016 49th Hawaii International Conference
    3. Volume and Number: N/A
    4. Page Numbers: N/A
    5. Date of Publication: 5-8 Jan. 2016

5. A cognitive model for solo programming and pair programming
    1. Name(s) of Authors: Kim Man Lui, K.C.C. Chan
    2. Place of Publication: Proceedings of the Third IEEE International Conference on Cognitive Informatics, 2004
    3. Volume and Number: N/A
    4. Page Numbers: N/A
    5. Date of Publication: 17 August 2014

Based on the articles published in Journals, I would like to recommend that Pair programming is better than solo programming. The journals clearly indicated that the productivity remains high for pair programming. The time required to complete the task has been reduced with the pair programming. The pair programming practice has also been proved to be easily readable and having more comments hence also possessing easily debugging ability.

The quality of the code is improved in the pair programming as well. Overall, the pair programming has an upper hand in the comparison. This practice has been proven extremely effective in the initial level programmers while no change was noticed in experienced programmers as the study cited by one of the journal. For the experienced programmers, the productivity was the same for single person as it was for the two combined in the pair programming. Hence, what I suggest is to have the team composed such that it has the mix of both practices: Pair programming and solo programming where the experienced professional can be given solo tasks while the beginners and the mid-level staff can be given tasks to be performed in the pairs.

Apart from that, the satisfaction for developers at different levels has also been seen higher in the pair programming practices and the stress level is reduced in the pair programming practitioners. The people learn significantly more, about the system and software development and ends up with multiple people understanding the project in a better way. The people learn to work together and talk more often giving better information flow and team dynamics. Pair programming helps one understand an unfamiliar problems and new requirements and provides an innovative approach to analyze empirical software engineering experiments. Hence, pair programming is better than traditional solo programming.