CULTIVATING ACADEMIC SELF-EFFICACY THROUGH SUPPORTIVE SOCIAL AND SELF-REGULATED LEARNING STRATEGIES FOR STUDENTS IN HIGHER EDUCATION

cct College Dublin
Computing • IT • Business

Graham Glanville
CCT College Dublin / University of Hertfordshire (EdD Cohort 9), May 2019

University of Hertfordshire UH

ABSTRACT

This research set out to enhance engagement in computer programming, a known difficult subject area for 1st year BSc in IT students. Programming lecturing staff had strong reservations about introducing group work in their classes, claiming group work was a counter-productive learning approach. The study was framed on a mixed methods action research approach, and a number of interventions, centred on reflective learning and social learning, were introduced. The findings indicated a strong preference by students to work in groups when tackling computer programming problems, but no strong evidence was found that reflective or social learning activities enhance programming skill level. A key contribution to practice was the introduction of a student mentoring academy within the institution, with programming as a central theme.

RESEARCH QUESTIONS

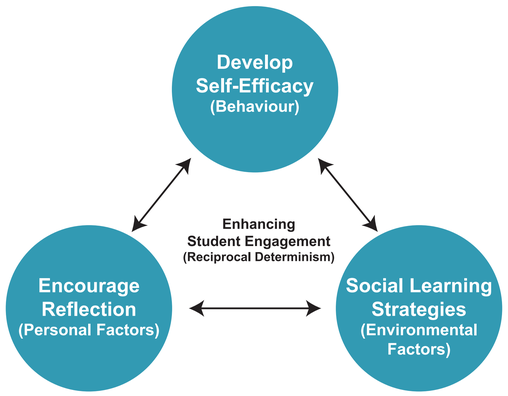
The four questions below represent the core focus of the entire study:

Q.1. Is a Reflective Learning Journal a useful and effective tool for engaging students in computer programming?
Q.2. Can the use of social learning strategies enhance student engagement?
Q.3 Are social learning strategies, such as Problem Based Learning and Peer Assisted Learning, effective tools in engaging students in computer programming?
Q.4 Can the use of social learning strategies enhance self-efficacy in computer programming?

CONCEPTUAL FRAMEWORK

The conceptual framework below, was developed from Bandura's (1986) Reciprocal Determinism model, in which Behaviour, Environmental Factors and Personal Factors were replaced with Self-Efficacy, Social Learning and Reflection, which became the basis for developing implementation strategies to enhance student engagement.

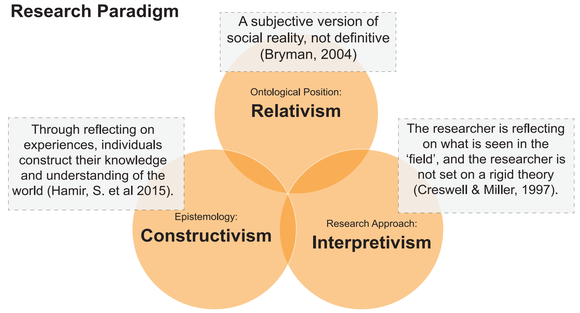
Conceptual Framework: Enhancing Student Engagement
(Adapted from Bandura's Reciprocal Determinism Model (1986))



RESEARCH PARADIGM

The empirical research studies were based on an interpretative approach, which allowed for greater freedom to include personal views and interpretations, and to form knowledge inductively from views and experiences of participants. The diagram below characterises the research paradigm for this study, which can be described as a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research (Bogdan and Biklen, 1998).

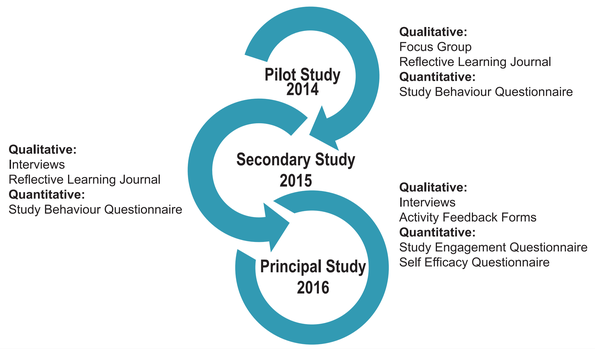
Research Paradigm



RESEARCH METHODS

The diagram below highlights the methods and tools used over the course of the action research study.

Summary of research methods and tools (2014-2016)



FINDINGS

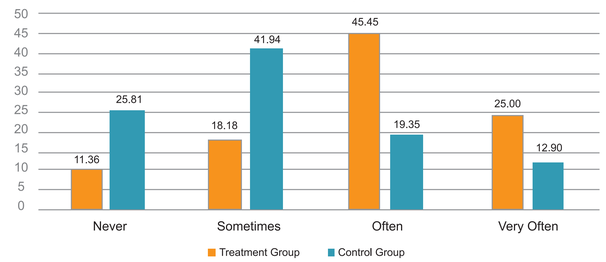
REFLECTIVE LEARNING

A reflective learning journal was provided to student participants in two of the action research studies, participants were asked to complete this journal on a weekly basis over the course of a semester. Students were not convinced of the benefits of using the journal over a long period of time, and found the activity a burden in some cases. Some viewed it as a piece of additional assessment that had no grade, furthering most to question the benefits. While some positive benefits were noticed, careful consideration is required if using such a tool for a class cohort, some individuals seemed to adapt better to this type of journaling activity than others.

STUDENT ENGAGEMENT

A student engagement measurement tool was provided to student participants at the start and end of a semester. A social learning intervention was applied to a treatment group, and the engagement scores across both the control and treatment groups were measured. The results revealed a small increase in the total student engagement group score for the treatment group, but nothing significant. However, interesting findings were found in some of the individual questions, the figure below represents one an example of this, in which the treatment group had scored considerably higher than the control group in a question relating to understanding people dissimilar to themselves, which would have been influenced through the social learning activities that the treatment group participated in. This, in itself, was an encouraging finding.

Understanding people of other racial, ethnic and national backgrounds (Question 11.10)



Response Options	Treatment Group			Control Group		
	Start	End	Difference	Start	End	Difference
Never	15.91	11.36	-4.55	25.81	25.81	0.00
Sometimes	36.36	18.18	-18.18	22.58	41.94	19.36
Often	25.00	45.45	20.45	35.48	19.35	-16.13
Very Often	22.73	25.00	2.27	16.13	12.90	-3.23

SOCIAL LEARNING (PBL and PAL activities)

Problem Based Learning (PBL) and Peer Assisted Learning (PAL) were introduced to a treatment group over the course of a semester. The quotes below represent a small sample of the overall positive feedback the participants expressed in terms of their enjoyment in participating in groups when solving programming problems:

"I learned I can work in a group. Although I most of the times would rather work alone, working in a group does make problem solving a lot easier".

"I enjoy programming but I'm 100% aware that my planning skills are way better than my programming skills. I wish we had more opportunities like this one to practice".

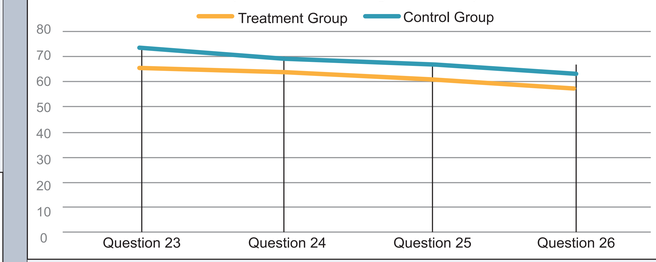
"Really enjoyable as I am better working with people. (I'm a really nervous person and individual evaluations makes me so nervous that I cannot concentrate)".

"These activities really makes more interaction among friends and for a given problem, we can solve it with many the best ways. And need to be continued in the coming weeks".

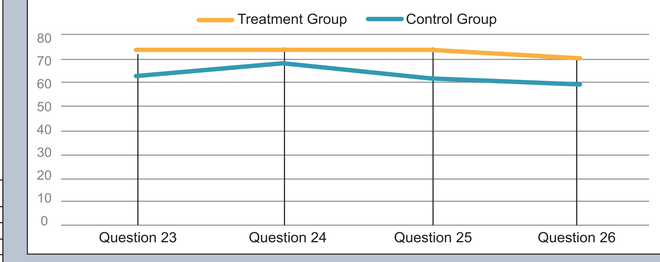
SELF EFFICACY

A significant finding was revealed when comparing the final four questions measuring the perceived ability to work within a group. To illustrate this, the first figure below represents the start of semester self-efficacy group score for both groups, followed by the second figure representing the end of semester self-efficacy score reversal.

Start of semester comparison of efficacy scores relating to group work (before social learning intervention)



End of semester comparison of efficacy scores relating to group work (after social learning intervention)



CONCLUSIONS

Q.1. There is sufficient evidence to suggest students enjoyed these specific approaches, and have an appetite for further sessions. Most of the feedback was positive, with some negative feedback associated with time allowed to complete the tasks, and the request for more help.
Q.2. There is some evidence to suggest it does, particularly relating to group based activities, and communicating with peers. It is, however, very difficult to say this finding was directly linked to the social learning activities introduced over the semester.
Q.3 The use of PBL and PAL was very successful in engaging students in computer programming, the students requested more of these activities in the future.
Q.4 Similar to the engagement result, there was no strong evidence to suggest social learning improved self-efficacy in computer programming, however, there was strong evidence participating in group work enhanced self-efficacy in working with others in group activities.

REFERENCES

Bandura, A. (1986). Social Foundations of Thought and Action: Social Cognitive Theory. U.S.A: Pearson Education.
Bogdan, R.C., Biklin, S.K. (1998). Qualitative research for education: An introduction to theory and methods. (3rd edition). Boston: Allyn and Bacon.
Bryman, A. (2004). Social Research Methods. U.K.: Oxford University Press.
Creswell, J.W., Miller, G.A. (1997). Research Methodologies and Doctoral Process. New Directions for Higher Education, no.99. U.S.A.: Wiley.
Hamir, S., Maion, S., Tice, S., & Wideman, A. (2015) Constructivism in Education. Available at: http://constructivism512.weebly.com. Accessed 27th February 2018.
Miles, M.B., & Huberman, A.M. (1994). Qualitative data analysis: A sourcebook of new methods. Thousand Oaks, CA: Sage.