Using Engagement Activity to Enhance the Intention to Persist of Vocational Students

Thanapat Sripan[1] and Chuchai Sujivorakul[2*]

[1]Learning Innovation in Technology Program, Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, Bangkok, 10140

*[*2]Department of Civil Technology Education, Faculty of Industrial Education and Technology King Mongkut's University of Technology Thonburi, Bangkok, 10140*

Received : 2020-05-13 Revised : 2020-07-07 Accepted : 2020-07-16

Abstract

The drop-out rate represents a significant problem for vocational education in Thailand. In 2017, the dropout rate of vocational students after 1st year was about 20%, which was very high number. A successful use of engagement activity in classroom would encourage the intention to persist of students in the school and lead to a decrease in the drop-out rate of students. The purposes of this study were: (a) to compare the students' achievement gained before and after using engagement activity ; and (b) to study the students' satisfaction after using engagement activity. The theories of Project-Based Learning (PjBL) and Socrative application were adapted in engagement activity. The research was quasi-experimental research by using one group pretest-posttest design. The samples were 30 people of 1st year vocational students from Ratchasittharam Technical College, Bangkok. They were in the 1st semester of the academic year 2019. The data analysis was based on statistic, mean, standard deviation (S.D.), relative gain score.

The research results were summarized as follows :

1. post-test score of the test was higher significantly than pre-test score ($p < .01$).

2. the results showed that students' satisfaction with using Socrative application was the highest level ($\overline{X}$ = 4.53, S.D. = 0.903).

The results of this study have implied that using engagement activity are important for educational planning to develop the competency of vocational students, because it would enhance the intention to persist of students, which is associated with decreasing drop-out rates of students in the Thai vocational education system.

Keywords : Student's achievement, students' satisfaction, Engagement activity, Intention to persist of students, Vocational education.

*Chuchai Sujivorakul

E-mail : *chuchai.suj@.kmutt.ac.th*

1. Introduction

Reducing the high levels of early school leaving is one of the main challenges facing in most of European education systems [1][2]. United Nations Educational, Scientific and Cultural Organization (UNESCO) have

recommended the provision of the Technical and Vocational Education and Training (TVET) program as a crucial measure for economic prosperity in developing countries [3]. However, recruiting students into the TVET and having them persist in vocational schools has remained a critical educational challenge across several countries in the world. For examples, less than one third of students in TVET programs finished their courses in Australia [4].

In Thailand, high drop-out rates among vocational learners hamper the efforts to produce skilled labor for the needs of business and the economy in general [5]. This situation is in spite of the fact that the Thai government has made significant efforts to improve the quality of Thailand's education.

In 2001, the world education had stepped forward to 21st Century. The results from the reform of education, with having western country and U.S.A. as the leader, had led to the word of "The skill of 21st Century", "21st Century Learning", "21st Century Education", or "21st Century Learner" [6]. In 2014, the development of the new curriculum in the vocational education level of Thailand had contained completely the skills of 21st Century [7]. This reform was the one important strategies to increase the proportion of vocational students. As the results of conforming to the direction of the world education, the learning of vocational students will focus on the less teaching and will let the students to learn more from doing activities (Teach Less, Learn More) [8]. The vocational education focused on the learning management in accompany with the engagement activity and the project-based learning. To be accomplished, the assessment in the class has to be observed from authentic learning of students [9]. This learning management will eventually enhance the standard of the educational quality in every level of vocational education.

In order to fully understand dropping out of school, one must take into account to theoretical notations of what is called "intention to persist". Intention to persist refers to intentions to continue one's schooling or dropping out of school [10]. According to Hang, Kaur, and Nur (2017) "Intentions to drop out referred to student aspiration or aim to finish or not to finish a programme of study" (p. 9) [11]. Intention to persist can be affected by various variables which may be internal or external to the student. From previous study, Sripan and Sujivorakul [12] found the factors related to decreasing the drop-out rate among vocational students in Thailand. Self-determination and school participation were the effective for decreasing the drop-out rate. Self-determination was the strongest predictor for intention to persist in school ($r = -.537$, $p < .001$). It was also found that school participation supports the intention to persist in school ($r = .155$, $p < .01$). Moreover, Sripan and Sujivorakul [13] explored variables that influence students' intention to persist in vocational education such as self-regulation strategies, school participation, self-determination, school identification and teacher autonomy. Data collection involved self-report surveys with 277 vocational

students from three vocational schools in Bangkok, Thailand. Pearson's correlation was used to test possible relationship among variables. The results showed that school participation, self-determination and school identification were the three variables identified that influenced intention to persist. In this study, engagement activity was used in the experiments with vocational students of Thailand, and it would influence the self-determination of students as well as school participation.From related previous studies, Jaeheng et al. [14] used ClassDojo and Socrative applications to develop in learning and the achievement of 31 2nd high vocational certificate students in the computer business department, Pattani Vocational College. The research used the one Group pretest-posttest design. The results showed that the engagement activity with using ClassDojo and Socrative applications influenced intention to persist of students and students' achievement was higher than before using the application at the 0.05 level of significant. Moreover, Kwankaew et al. [15] found that using project-based learning (PjBL) for high vocational students would influence the development of students associated with self-determination of students.

Hence, the authors would focus on the research of using engagement activity including project-based learning (PiBL) together with Socrative application with the 1st year vocational students, which would encourage students to persist their study in the school. Moreover, the students in this study will better understand the thinking skills and working process, which are suitable competency for developing the skills of the good craftsman in 21st century of the industrial sector.

2. Literature review

There is certain engagement activity that have been associated with decreasing the drop-out rate. In this paper, we would focus on engagement activities using project-based learning and Socrative application as given in following details.

Engagement activity is the process of working with groups to address issues that impact the well-being in groups [16]. Activities that help firms engage the class include credible and transparent reporting, meetings and collaborative decision making [17][18]. Firms that most proactively engage the class often find efficiencies in pushing forward with new projects because they have secured the group to operate [19]. They often develop the most innovative products and processes because of the need to balance sometimes conflicting points of view, forcing them to think outside the box for new solutions [20]. However, such engagement activities often take considerable firms' resources and time, but there is widespread agreement for most firms involved in community engagement that such efforts are highly rewarded [21].

For Project-based learning (PjBL), Bender [22] explained the learning with this method that the student will be the person who will select the problem that would like to find the answer. Later, this will develop the project to find the answer in solving those problems and

communicating to let others to acknowledge [23][24].

Socrative application is a free web application that offers an easy and friendly experience to teachers to engage and assess their students [25]. It is an easy to use tool that is used for creating formative assessments and getting result in the actual-time [26]. Guarascio et al. [27] found that students felt Socrative application helped them to more actively participate in class and facilitated a better environment for asking and receiving answers to classroom questions.

3. Purposes of the study

The purpose of this paper reports the results of the study from using engagement activity that have been associated with the intention to persist of vocational students. The study was set in Thailand. However, the results may be relevant in other contexts where drop-out rates are high for vocational education. The main results of this study were as follows: (a) to compare the students' achievement gained before and after using Socrative application; (b) to study the students' satisfaction after using engagement activity.

4. Research Methodology

4.1 Participants

This study was quasi-experimental research by using one group pretest-posttest design. The sample was purposive sampling. Participants were 30 first-year students. They were studied in the 1 st semester of the academic year 2019 from Ratchasittharam Technical College, Bangkok, Thailand.

4.2 Instruments and procedures

This study took place in the first semester, 2018 – 2019. Research instruments consisted of : a) lesson plan ; b) Socrative application which consisted of learning materials, activities, a mobile phone and internet ; and c) engagement activity before experiment was divided in four lesson plan. Project-based learning were used in the process, and the results of this study were evaluated from pre-test, post-test, and students' satisfaction survey. The process from using engagement activity in a classroom was divided in 9 weeks that included the following steps (see on Table 1):

4.2.1 Pre-experiment : researcher performed to measure students' knowledge with pre-test in Socrative application (as shown in Figures 1 and 2). In addition, for each lesson the researcher conducted about preparation, plan, objective, topics and contents of engagement activity.

4.2.2 During experimental process : researcher implemented the engagement activity for the group of experimental students. The researcher divided the students into small groups (4-5 persons/group).

4.2.3 Post-experiment : researcher conducted the survey about students' satisfaction from using engagement activities with project-based learning (PjBL) and Socrative application. Finally, the students were evaluated students' achievement gained before and after using engagement activity by

using post-test examination measured the same aspects given in pre-experiment.

4.3 Analysis

The researcher gathered quantitative data and checked the completeness of answers from students' satisfaction obtained by the survey and students' scores from pre-test and post-test. Basic statistics including mean, percentage and standard deviation were used to evaluate pre-test and post-test scores.

Figure 1 : The display result of Socrative application – teacher aspect

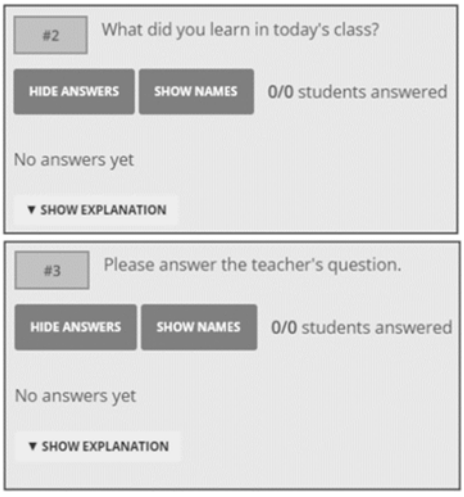

Figure 2 : The display result of Socrative application -- students aspect

Table 1: The process of using engagement activity

Week	Methods	Engagement Activity (PjBL)	Period of time	Socrative application
1	Preparation	Teacher prepares the scope of the project, data sources and leading questions. Data sources can be video clip or online news. Evaluation from pre-test.	1 week	Pre-test
2	Feasibility study	Students study project scopes and data sources, and students exchange their data and have discussion within group members to answer the questions that teacher had been set.	1 week	
3-4	Defining topics	Students discuss within the group and define their project. When teacher has agreed students' topic, students do the work according to the plan, and present the progress to teacher.	2 weeks	
5-6	Creation process	Each member shares his/her tasks during the work process, exchange his/her knowledge within the groups.	2 weeks	
7-8	Presentation	Students prepare reports and present the results of the project's activities by using online tools, video clip, or Facebook etc.	2 weeks	
9	Test	Evaluation from post-test	1 week	Post-test

5. Results

Data analysis was used to conduct the results from using engagement activity of vocational students. The final sample was experimented with a group of students (N=30). They were studying in 1st semester in academic year's 2019 from Ratchasittharam Technical College. The findings were summarized as follows in Tables 2 and 3 respectively.

The results of the analysis were shown in Table 2 and presented the results of the students' achievement gained before and after using Socrative application. The result revealed a significant difference between the mean score of pre-test and post-test score at $p < 0.01$, and the comparison of mean scores (as shown in Figure 3). The sample group had higher post-test scores ($\overline{X}$ = 24.21, 81.5 percent) than the pre-test scores ($\overline{X}$ = 12.82, 43.6 percent).

Table 2: Comparison of mean scores in final week

Score	$\bar{X}$	S.D.	t	p value
Pre-test (n=30)	12.82	5.861	4.326	.000
Post-test (n=30)	24.21	6.646		

Table 3: Results of students' satisfaction from using Socrative application

Items	$\bar{X}$	S.D.
Satisfaction from using Socrative application	4.53	.903
1. This application is modern.	4.53	.860
2. This application is easy to use.	4.67	.875
3. This application can reduce the time to review lessons.	4.40	.907
4. This application is accurate in examining the answers.	4.50	.971
5. This application is explained clear procedure.	4.57	.904

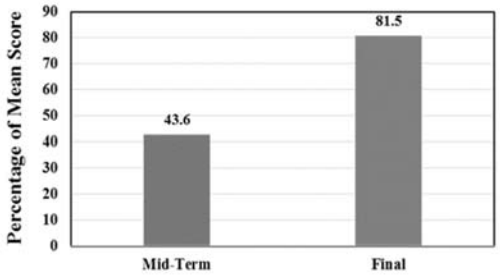

Figure 3 : The score from pre-post tests

The results of the analysis were shown in Table 3 and presented the results of the students' satisfaction from using Socrative application. The most of student's satisfaction was "this application is easy to use" ($\bar{X}$ = 4.67). The remaining of students' satisfaction were "this application is explained clear procedure" ($\bar{X}$ = 4.57), "this application is modern" ($\bar{X}$ = 4.53), "this application is accuracy in examining the answers" ($\bar{X}$ = 4.50), and "this application can reduce the time to review lessons" ($\bar{X}$ = 4.40) respectively.

Figure 4 : The results from using engagement activities of vocational students.

6. Conclusion

In this study, the successful results after using engagement activities in a classroom of vocational students were obtained and will indicate the enhancement of the intention to persist in vocational education (as shown in Figure 4). The results of using engagement activity were summarized in details as follows:

6.1 The students had improved the post-test scores significantly at $p < 0.01$. It was found that the sample group had higher post-test scores (81.5 percent) than the pre-test scores (43.6 percent).

6.2 The students satisfy this application because "it is easy to use" ($\bar{X}$ = 4.67), "this application is explained clear procedure" ($\bar{X}$ = 4.57), and "this application is modern" ($\bar{X}$ = 4.53).

6.3 The students had developed the knowledge and skills by observing that students' 21st century learning skills was improved with the high level ($\bar{X}$ = 4.53, S.D. = .903).

7. Discussion

This study explored the result from using engagement activity that have been associated with decreasing the drop-out rate. The process of using engagement activity included preparation, feasibility study, define topics, creation process and presenting (as shown in Figure 5). These processes would enhance students to be active-learning people (see Figure 6). The results in the classroom demonstrated that the engagement activity enable the students to gain experience and the post-test of scores of

the students was significantly higher than those of pre-test scores, because this engagement activity has highlighted some important of both good environment and encourage students to interact with friends in class [13]. Many researches had shown that students did better both socially and academically after using engagement activity, because it was about the effects of learning activities to develop creative characteristics. After using project-based learning (PjBL) for high vocational students, it was indicated that mean of ost-test scores were statistically significantly higher than the mean of pre-test scores after experiment and of 1-semester experiment later [15]. Therefore, using this learning activities would be the strategy to support diversity vocational students. The guidelines have stated that education should give emphasis to knowledge, and be based on the principle that allow all learners to develop themselves [28].

The results also indicated that learners who practice with engagement activity tend to have relatively strong good intention to persist in vocational school [29][30]. This finding suggests that, to improve intention to persist in school, learners' engagement activity should be highlighted.

8. Recommendations

Further research is needed to explore the possible influence of other factors, such as teacher support, and engagement activity. It would be valuable for future studies to involve learners of different learning levels and from different cultures. Future studies are encouraged to use a qualitative approach or focus on a group for in-depth insights into students' engagement in vocational education.

8.1 Suggestions for Enhancing Vocational Education associated with decreasing the drop-out rate

8. 1. 1 The engagement activities, such as project-based learning (PjBL) and socrative application, should be applied in the vocational class.

8. 1. 2 Technical colleges should prepare teachers and train students to have better understanding the concept of engagement activities for effective learning.

8. 1. 3 Technical colleges should develop the school identification to influence the intention of students to persist in vocational schools.

(a)

(b)

(c)

Figure 5 : The experimental process of using engagement activities

8.1.4 Technical colleges should develop school participation activities both in classroom and outside classroom in the curriculum for vocational students.

8.2 Suggestions for Future Research.

8.2.1 Future research should be focused on in-depth research about engagement activity in class.

8.2.2 Future research should be studied the in-depth factors that will help students to the intention to persist in vocational schools such as student-related factors, family-related factors and community-related factors.

8.2.3 Future research should be studied on another Vocational Technical Colleges in different cultural and contexts.

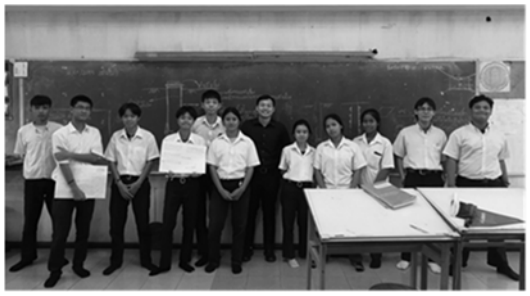

Figure 6 : The participants in the experiment using engagement activities

References

[1] A. Cerda-Navarro, J. Sureda-Negre and R. Comas-Forgas. "Recommendations for Confronting Vocational Education Dropout : A Literature Review". Empirical Research in Vocational Education and Training, 9(1), pp. 17-39, 2017.

[2] O. Melkevik, W. Nilsen, M. Evensen, A. Reneflot and A. Mykletun. "Internalizing Disorders as Risk Factors for Early School Leaving : A Systematic Review". Adolescent Research Review, 1(3), pp. 245-255, 2016.

[3] B. T. T. Hang, A. Kaur, and A. H. B. Nur. "A Self-Determination Theory Based Motivational Model on Intentions to Dropout of Vocational Schools in Vietnam". Malaysian Journal of Learning and Instruction, 14(1), pp. 1-21, 2017.

[4] J. Rosenberg. "Drop-Out Rate High in Vocational Training". The Sidney Morning Herald, 2011. Retrieved on July 10, 2018, from http://www.smh.com.au/national/education/dropout-rate-high-invocational-training-20111024-1mgeh.html.

[5] M. S. Momo, S. J. Cabus, K. De Witte and W. Groot. "A Systematic Review of the Literature on the Causes of Early School Leaving in Africa and Asia". Review of Education, 7(3), pp. 496-522, 2019.

[6] P. Griffin and E. Care. "Assessment and Teaching of 21st Century Skills: Methods and approach". Springer, 2014.

[7] I. O. Pappas, M.N. Giannakos and L. Jaccheri. "Investigating Factors influencing Students' Intention to Dropout Computer Science Studies". In Proceedings of ACM Conference on Innovation and Technology in Computer Science Education, 2016, pp. 198-203.

[8] N. Ongardwanich, S. Kanjanawasee and C. Tuipae. "Development of 21st Century Skill Scales as Perceived by Students". Procedia-Social and Behavioral Sciences, 191, pp. 737-741, 2015.

[9] E.F. Zeer and A.V. Streltsov, A.V. "Technological Platform for Realization of Students' Individual Educational Trajectories in a Vocational School". International Electronic Journal of Mathematics Education, 11(7), pp. 2639-2650, 2016.

[10] P.L. Hardre and J. Reeve. "A Motivational Model of Rural Students' Intentions to Persist in, Versus Dropout of, High School". Journal of Educational Psychology, 95(2), pp.347-356, 2003.

[11] B. T. T. Hang, A. Kaur and A. H. B. Nur. "A Self-Determination Theory Based Motivational Model on Intentions to Drop out of Vocational Schools in Vietnam". Malaysian Journal of Learning and Instruction, 14(1), pp.1-21, 2017.

[12] T. Sripan and C. Sujivorakul. "Factors Related to Decreasing the Drop-Out Rate among Vocational Students". In Proceedings of the 37th IRES International Conference, 2016, pp.54-57.

[13] T. Sripan and C. Sujivorakul. "Variables that Influence the Intention to Persist in Vocational Education". International Journal of Instruction, 3(2), pp. 17-32, 2020.

[14] S. Jaeheng, M. Saleang, F. Deemae, S. Uso, A. Jaeso, M. Wadramae. "Using ClassDojo and Socrative applications to develop in learning and the chievement of 2nd high vocational certificate students in the computer business department, Pattani Vocational College." Active Learning National Conference, pp.458-466, 2018. DOI : 10.14457/ WU.res.2018.29.

[15] P. Kwankaew, P. Vanichvasin and S. Siripipattanakoon. "Development of Creative Characteristics using Project-Based Learning (PjBL) for High Vocational Students of Program in Secretarial". Journal of Southern Technology, 9(1), pp. 1-6, 2016.

[16] H. Heflin, J. Shewmaker and J. Nguyen. "Impact of Mobile Technology on Student Attitudes, Engagement, and Learning". Computers & Education, 107, pp. 91-99, 2017.

[17] E.F. Fitzgerald, K. Bruns, S.T. Sonka, A. Furco and L. Swanson. "The Centrality of Engagement in Higher Education". Journal of Higher Education Outreach and Engagement, 20(1), pp. 223-244, 2016.

[18] R.M. Alvarez-Bell, D. Wirtz and H. Bian. "Identifying Keys to Success in Innovative Teaching : Student Engagement and Instructional Practices as Predictors of Student Learning in a Course using a Team-Based Learning Approach". Teaching and Learning Inquiry, 5(2), pp. 128-146, 2017.

[19] J. Dillon, N. Bosch, M. Chetlur, N. Wanigasekara, G.A. Ambrose, B. Sengupta and S.K. D'Mello. "Student Emotion, Co-Occurrence, and Dropout in a MOOC Context". In Proceedings of the 9th International Conference on Educational Data Mining, 2016, pp. 353-357.

[20] D. Green, C.N. Allan and J. Crough. "What Is the Purpose? Using Blended Learning Designs to Purposefully Focus on Student Engagement, Support and Learning. In Blended Learning Designs in STEM Higher Education". Springer, pp. 35-58, 2019.

[21] R. Crues, N. Bosch, M. Perry, L. Angrave, N. Shaik and S. Bhat. "Refocusing the Lens on Engagementin MOOCs". In Proceedings of the Fifth Annual ACM Conference on learning at scale, 2018, pp. 1-10.

[22] W.N. Bender. "Project-Based Learning: Differentiating Instruction for the 21st Century". Corwin Press, 2012.

[23] S. Bell. "Project-Based Learning for the 21st Century: Skills for the Future". The Clearing House, 83(2), pp. 39-43, 2010.

[24] W. Sumarni. "The Strengths and Weaknesses of the Implementation of Project Based Learning: A Review". International Journal of Science and Research, 4(3), pp. 478-484, 2015.

[25] A.R. Sweat. "Quick In-Class Learning Activities to Build Student Engagement" Retrieved on November 9, 2017, fromhttps://teachingcommons. lakeheadu.ca/index.php/20- quick-class engagement activities.html.

[26] J.A. Martín García, J. Rodríguez Calcerrada, M.V. Fernández Fernández, E. Román and P. Pita Andreu. "Improvement of the Learning Process Through the Use of Socrative Application with undergraduate Students at the Technnical University of Madrid", pp. 8833-8837, 2017.

[27] A.J. Guarascio, B.D. Nemecek and D.E. Zimmerman. "Evaluation of Students' Perceptions of the Socrative Application versus a Traditional Student Response System and its Impact on Classroom Engagement". Currents in Pharmacy Teaching and Learning, 9(5), pp. 808-812, 2017.

[28] P. Dechakubt, P. "Integrated Teaching and Learning on 21st Century Learning kills". Chulalongkorn University, 2017.

[29] B. Cervantes, L. Hemmer and K.Kouzekanani. "The Impact of Project-Based Learning on Minority Student Achievement : Implications for School Redesign". Education Leadership Review of Doctoral Research, 2(2), pp. 50-66, 2015.

[30] J.M. van Uden, H. Ritzen and J.M. Pieters. "Engaging students : The role of teacher beliefs and interpersonal teacher behavior in fostering student engagement in vocational education". Teaching and Teacher Education, 37, pp. 21-32, 2014.6066, 2012.