The Assessment for learning of Cooperative Learning Activities using Online Team Game Tournament Technique (TGT)

Rattaporn Klinmalee[1] and Pawintana Charoenboon[2]
[1]Faculty of Education, Nakhon Si Thammarat Rajabhat University, Thailand, e-mail: rattaporn_kli@nstru.ac.th
[2]Division of Business Administration, School of Interdisciplinary Studies, Mahidol University Kanchanaburi Campus, Thailand, e-mail: pawintana.cha@mahidol.ac.th

Abstract

The use of technology in classrooms is steadily increasing. Whether one feels that computers should be an integral part of education for pedagogical reasons or that their usage is acceptable solely because of the technical necessities of the environment in which today's students will work, this expansion will continue. This research study the efficiency of develop cooperative learning activities using TGT for improving learning achievement and teamwork skills and for analyze students' teamwork skills after learning through cooperative learning activities using TGT. The research model is quasi-experimental research. A total of 59 students. The results revealed that the efficiency of cooperative learning activities using online team game tournament technique for improving learning achievement and teamwork skills passed the criterion of 81.35/85.49 higher than the specified criteria of 80/80. The students' post-test score using cooperative learning activities using TGT was higher than pre-test score statistically significant at .05 level, the instructors assessed overall students' teamwork skills at the high level and the students assessed overall their teamwork skills at the high level.

Keywords: Develop Cooperative learning activities, Online team game tournament technique, Learning achievement, Teamwork skills

Introduction

COVID-19 [1] has forced the closure of the majority of courses. Although the learning system [2, 3] has evolved to include online instruction, it is not as effective as classroom instruction [4, 5]. The produce problems with learning [2, 3, 6-9]that must be interrupted due to the parents' lack of preparation since students lack computer equipment internet connection [10-14]lack of interaction with friends due to excessive screen time. Finally, both student and instructors are stressed. "For a long time, the student's learning [3] loss and lack of review". It's possible that information will vanish may also have an impact on basic knowledge [2, 15] in vital areas, which is the foundation for society's human capital growth. Many governments are attempting to address the issue by introducing new gadgets. Increase student access to the Internet. Increase the internet for students to learn[16]. The impact [5, 17, 18]on classroom management in an on-site manner. As a result, an online group approach [19] to learning management [20] has emerged. This is the introduction of cutting-edge technology [1, 21-24] and blended learning approaches [3, 25] that involve many people, including teachers, students, and other stakeholders. Instruction [4, 5] for

presenting content through various media on the internet can share resources or content by connecting to the internet.

Improved curriculum [2] for the Bachelor of Education in Computer program in 2019. Nakhon Si Thammarat Rajabhat University's, faculty of education offers a specialist course in computer network system, course code 1142704, 3 (2-2-5) credits. To study Communication theories. Computer network systems. Communication protocol. Topology. Security systems, internet systems. Analyze, design and install computer network inside and outside organizations. Maintain network and server systems. Practical learning in which students can study independently and in groups. Improve learning management efficiency [15]. As a result, teachers show a significant part in the research of teaching methods. Find appropriate strategies to solve a variety of challenges. To be consistent and stay up with 21st century education, which strives to improve students' long-term understanding in the manner of active learning [5].

The cooperative learning [26, 27] approach was proven to be capable of solving difficulties in a research of several teaching styles. Because it is a learning management strategy that stresses learning environment organization [28]. Make pupils learn in groups of two to six persons. Each group is made up of individuals with varying talents. Students take part in group learning and achieve achievement. The small-group cooperative learning with 3-6 members. Such learning aids in the achievement of the group's objectives. The collaborative [25] learning among students each squad possesses unique skills [2, 8, 26, 29-33]. The learning by students who are better at assisting other student's management of cooperative learning and learning management approaches [3, 25] can help you improve your learning outcomes, as well as teamwork abilities [25, 34-36] Team-Games Tournament learning management is done in 4-5 groups per team, with people separated into strong, medium, and weak categories. 1) material presentation 2) team activity 3) competitive stage 4) and team achievement stage are the stages. The teacher compiles the competition scores of the students, then give the trophy to the squad that scored the highest. This type of instruction can help pupils establish a drive to study. Student achievement improves when they interact with their peers.

The content of numerous lessons makes up the general state of learning management in the course of computer network system [20]. The learning units are not all created equal because practical abilities are required [4, 37]. The most teachers employ a lecture-based learning management strategy for learning management as well as the usage of media [14, 28, 38] in the classroom students participating in classroom activities lack attention-getting strategies and learning management procedures [5, 6, 39] that allow them to solve problems independently. Academic attainment is not particularly high since students have various knowledge bases and learning abilities. As a result, practical skills are lacking, and the course knowledge cannot be used in practice.

The researcher is interested in researching and solving the problem.

The collaborative learning management, teamwork tactics, and online [19] learning activities are some of the methods used. Students will be encouraged to think critically and solve problems by participating in activities and develop self-awareness through a variety of experiences Teamwork skills are developed through student interaction. The researcher wants to see if this type of learning management can boost students' academic accomplishment based on the defined criteria, as well as how much their teamwork abilities improve after using this technique. The effectiveness of designing cooperative learning activities utilizing online team competition tactics to increase academic achievement and teamwork abilities is investigated in this study.

Research Methodology

This research has the following research:

1. This research model was to develop a collaborative learning activity using online team competition techniques to promote academic achievement and teamwork skills, there is a quasi-experimental research.

2. The population and the sample group were students in the Computer education, Faculty of Education. Rajabhat University, Nakhon Si Thammarat, a total of 214 people. The sample group was 2-year computer students from the faculty of education, who studied computer network system for 2 academic year 2021, Purposive sampling total 59 people.

3. Research instruments

This study's instruments, the following is the procedure for developing and testing the quality of the tools:

3.1 Plan for cooperative learning activities 2 Unit 1, Fundamentals of Information Communication Systems, Signal Systems, OSI Network Architecture, and Unit 2, computer network system, using the technique of online team competition in the course of computer network system. Total number of learning management plans = 2, with each hour lasting 50 minutes.

3.2 Educational performance assessment computer network system. The conformity of a 30-item, five-choice, multiple-choice test to Item-Objective Congruence Index (IOC) was assessed and the test passed a quality analysis. The determine meaning through the use of reliability, difficulty, and discrimination

3.3 Instructor's Teamwork Skills Observation form, 10 items, rating scales, 5-level assessment scale weight assessing the congruence between the test and the learning objectives, according to the Likert scale [40]

3.4 The 10-item self-assessment questionnaire on teamwork skills. The weights of the Likert 5-Stage assessment scale were analyzed using rating scales for consistency between the test and the assessment objectives. The item-objective congruence index (ICOC): 3 specialists inspect the equipment quality in this study.

4. Data collection method

The research data was collected by the researcher. The information is presented in the following order.

4.1 Explanation of cooperative learning activities in the field of computer

network system in student institutions using online team competition strategies.

4.2 Before studying, take a test to assess your progress.

4.3 Use cooperative learning management and the TGT technique to educate the sample group according to the lesson plan and teaching according to a standard learning management plan with two groups, with the researcher as the teaching operator.

4.4 Test the sample group after class using a test to measure achievement after learning and record the test results for data analysis to analyze the data and report the research findings.

4.5 After class, observe students' collaboration skills. The TGT co-learning management strategies are used. In the assessment, the teacher employed a 10-item observation form for collaborative abilities. Self-assessment of students' teamwork skills10 person, the number of self-assessments is used by the students.

4.6 The researcher looked into the student' academic performance and teamwork abilities. The Statistics and data analysis in research, the researcher followed the steps below to do the data analysis.

4.5 After class, observe how well students work together. The TGT's co-learning management strategies in the evaluation, the teacher employed a 10-item observation form to assess teamwork abilities. The number of self-assessments used by the students is 10.

4.6 The academic accomplishment and teamwork skills of the students were studied by the researcher.

5. Research statistics and data analysis analyzing the data: The Student's t test is used to compare the means between two groups, whereas ANOVA is used to compare the means among three or more groups.

Research results

The results of the analysis of students' teamwork skills after studying by using the learning activities Collaborate by using online team game tournament technique (TGT). The results of data analysis are as follows:

Table 1. The results of the analysis of students' teamwork skills after studying by using the co-curricular learning activities, using online team game tournament technique (TGT), the instructor analyzes the students' teamwork skills.

No	Topic	Mean	S.D.	Rank
1	Roles have been assigned. Team members' responsibilities.	4.09	0.87	7
2	The team's goals and objectives have been established.	4.18	0.70	4
3	The activities are organized collectively.	4.33	0.82	1
4	There is consensus within team .	4.00	0.81	8
5	Team members must adhere to team agreements.	4.25	0.60	2
6	The communication is effective.	3.89	0.76	9
7	There is an adaptation to each other teachers and teammates.	3.47	0.73	10

No	Topic	Mean	S.D.	Rank
8	If there is an issue, there is conversation to resolve it.	4.16	0.73	5
9	There is a desire to learn and participate in group activities.	4.19	0.76	3
10	Team members execute their responsibilities on time.	4.07	0.81	6
	Overall	**4.059**	**0.753**	

The results showed that overall of teamwork skills using online team game tournament technique (TGT); The activities are organized collectively (Mean = 4.33), Team members must adhere to team agreement (Mean = 4.25), There is a desire to learn and participate in group activities (Mean = 4.19), The team's goals and objectives have been established (Mean = 4.17), If there is an issue, there is conversation to resolve it (Mean = 4.07), Roles have been assigned. Team members' responsibilities (Mean = 4.06), There is consensus within team (Mean = 4.00), The communication is effective (Mean = 3.89) and There is an adaptation to each other teachers and teammates (Mean = 3.47).

The results of finding the efficiency of the development of cooperative learning activities by using online team game tournament technique (TGT) were analyzed as shown in Table 2.

Table 2. Effectiveness of cooperative learning activities using TGT technique

Test	No. of Student	Full Score	Mean	Percent
Pre-experiment scores (E_1)	59	20	16.43	81.35
After-experiment scores (E_2)	59	30	26.07	85.49

The effectiveness of cooperative learning activities using by using online team game tournament technique (TGT). The efficiency was 81.35/85.49, which is higher than the 80/80 criteria, the mean of pre-experiment scores (E_1) was 16.43 and after-experiment scores (E_2) was 26.07 shows that the efficiency of using Team Game Tournament Technique results in the improvement of students in learning.

Table 3 Differences in after learning activities to using TGT competition approaches based on Gender (N=59) (t-test)

	Team work	Male	Female	t	p-value
1	Roles have been assigned. Team members' responsibilities	3.656	4.231	1.002	.3201
2	The team's goals and objectives have been established.	3.828	4.212	2.816	.0062*
3	The activities are organized collectively.	3.812	3.985	3.021	.0474*
4	There is consensus within team	3.875	3.671	2.340	0.027*
5	Team members must adhere to team agreements.	4.192	4.228	1.201	0.000*
6	Communication is effective.	3.656	3.978	2.024	0.000*
7	There is an adaptation to each other teachers and teammates	3.828	3.975	1.210	0.621
8	If there is an issue, there is conversation to resolve it.	3.812	4.120	2.154	0.000*
9	There is a desire to learn and participate in group activities.	3.875	3.444	4.005	0.412
10	Team members execute their responsibilities on time.	3.792	4.250	1.021	0.000*

* Denotes significant differences between groups at the 0.05 level

The differences in after learning activities to using online team game tournament technique (TGT) competition approaches based on Gender (N=59). The result show that different genders affect the team's goals and objectives have been established, the activities are organized collectively, there is consensus within team, team members must adhere to team agreements, the communication is effective, if there is an issue, there is conversation to resolve it, team members execute their responsibilities on time significant differences between groups at the 0.05 level

Table 4 Means and S.D. of paired samples t-testing between experimental and control groups

Variable	control group (n=29)		experimental group (n=30)		t	p-value	Variable and Effect	MSF	p-value	ANOVA Test
	mean	S.D.	mean	S.D.					F	p-value
TGT techniques										
Pretest	29	4.3	30.15	3.4	2.7	.417	Between group	586.7	15.7	0.001*
Posttest	40.2	5.1	36.75	4.2	2.7	.010	Within group	1192.2	117.3	0.000*
Time	39.4	4.1	30.40	4.7	1.3	.000	Interaction group*time	350.1	20.9	0.000*

Cooperative Learning Activities using Online Team Game Tournament Technique, the result show that mean, there was a statistically significant difference at the .05 level. **(** F=15.7, p < .05) and after test the value of Interaction group*time between control group and experiment group there was a statistically significant difference at the .05 level. **(** F=20.9, p < .05), when consider pretest, posttest and time period the result show that there was a statistically significant difference at the .05

Conclusion

the cooperative learning activities using online team game tournament technique (TGT) that improve academic success and teamwork abilities. Five elements emerge from a collaborative learning management employing a team competition technique to provide new knowledge valuable for teaching and learning management: 1) presentation of content 2) forming a team 3) game together with the online learning activities, 4) competition and 5) acknowledgement of team efforts result in higher student achievement. In addition, learners acquire cooperation abilities in six areas: 1) a similar objective, 2) mutual respect, 3) cooperating with one another, 4) sharing tasks based on their talents, 5) responsibility and 6) understanding together in class. The developing collaborative learning activities employing team competition strategies online to improve academic success and teamwork skills as efficient as 81.35/85.49 outperforms the threshold 80/80, according to this study. Learners had higher academic accomplishment after adopting cooperative learning activities and online team competition approaches, with an average score of 26.07, compared to a mean score of 16.43 previously, with a statistical significance at the.05 level. The activities are organized collectively (Mean = 4.33), and team members must adhere to team agreement (Mean = 4.25). Overall, it was at a high level, with an average of 4.059.

The establishment of learning activities here is beneficial, according to the findings. make the learners' learning achievements clearer, and can also encourage learners to reach a variety of learning goals and play a bigger part in learning under dispersion conditions, online technology allows for planning, issue resolution, and team learning. The coronavirus disease outbreak of 2019, which includes the development of teamwork abilities to enable the pupils' own team to operate rapidly and efficient teachers should be given suggestions for how to use the research findings. Make your schedule appropriately, so that students can learn the content completely teachers should encourage learners to see group importance mutual assistance and acceptance of differences between individuals1 in the next research. The researcher should look into how collaborative learning management and team competition techniques are used. Try it out online with students in various grades or courses, as well as study approaches for learning management. Other enhancements related to the management of collaborative learning strategies for online team competition.

Reference

1. Liu, H.Y., Effect of interdisciplinary teaching on collaborative interactions among nursing student teams in Taiwan: A quasi-experimental study. Nurse Educ Today, 2021. 106: p. 105083.
2. Alwahab, A., et al., Team-based learning in an undergraduate pathology curriculum and its effects on student performance. J Taibah Univ Med Sci, 2018. 13(5): p. 496-501.
3. Anderson, A.N., et al., Lessons learned: Assessing team creation by personality inventories in pharmacy students. Curr Pharm Teach Learn, 2021. 13(11): p. 1538-1543.
4. Park, H.R. and E. Park, Nursing students' perception of class immersion facilitators in psychiatric nursing: Team-based learning combined with flipped learning. Nurse Educ Today, 2021. 98: p. 104653.
5. Randall, S., T. Crawford, and J. River, Us and them: The experience of international nursing students engaged in team based learning: A qualitative descriptive study. Nurse Educ Today, 2020. 92: p. 104527.
6. Anderson, S.M., et al., Impact of a team-based learning drug misuse education training program on student pharmacists' confidence. Curr Pharm Teach Learn, 2019. 11(1): p. 58-65.
7. Aranzabal, A., E. Epelde, and M. Artetxe, Team formation on the basis of Belbin's roles to enhance students' performance in project based learning. Education for Chemical Engineers, 2022. 38: p. 22-37.
8. Caldas, L.M., et al., Team teaching with pharmacy practice and pharmaceutics faculty in a nonsterile compounding laboratory course to increase student problem-solving skills. Curr Pharm Teach Learn, 2020. 12(3): p. 320-325.
9. Chen, M.-H. and S. Agrawal, What leads to effective team learning performance within university students? The moderating effects of 'Guanxi'. The International Journal of Management Education, 2018. 16(3): p. 432-445.
10. Castillo-Salinas, L., et al., Evaluation of the implementation of a subset of ISO/IEC 29110 Software Implementation process in four teams of undergraduate students of Ecuador. An empirical software engineering experiment. Computer Standards & Interfaces, 2020. 70.
11. Ganotice, F.A. and L.K. Chan, How can students succeed in computer-supported interprofessional team-based learning? Understanding the underlying psychological pathways using Biggs' 3P model. Computers in Human Behavior, 2019. 91: p. 211-219.
12. Huizenga, J., et al., Mobile game-based learning in secondary education: Students' immersion, game activities, team performance and learning outcomes. Computers in Human Behavior, 2019. 99: p. 137-143.
13. Johnson, T.E., E. Top, and E. Yukselturk, Team shared mental model as a contributing factor to team performance and students' course satisfaction in blended courses. Computers in Human Behavior, 2011. 27(6): p. 2330-2338.
14. Paige, J.T., et al., Getting a head start: high-fidelity, simulation-based operating room team training of interprofessional students. J Am Coll Surg, 2014. 218(1): p. 140-9.
15. Khalafalla, F.G., et al., Enhancing nutrition and lifestyle education for healthcare professional students through an interprofessional, team-based training

program. Curr Pharm Teach Learn, 2020. 12(12): p. 1484-1490.
16. Türel, Y.K., Relationships between students' perceived team learning experiences, team performances, and social abilities in a blended course setting. The Internet and Higher Education, 2016. 31: p. 79-86.
17. Silberman, D., et al., The impact of team-based learning on the critical thinking skills of pharmacy students. Curr Pharm Teach Learn, 2021. 13(2): p. 116-121.
18. Stucky, C.H., M.J. De Jong, and Y. Liu, Military Surgical Team Performance: The Impact of Familiarity, Team Size, and Nurse Anesthesia Students. J Perianesth Nurs, 2022. 37(1): p. 86-93.
19. Khansari, P.S. and L. Coyne, An innovative addition to team-based-learning pedagogy to enhance teaching and learning: Students' perceptions of team exams. Curr Pharm Teach Learn, 2018. 10(1): p. 90-95.
20. Turner, K., et al., Effects of 5 Dynamics on student perception of team performance. Curr Pharm Teach Learn, 2021. 13(4): p. 438-442.
21. Karlsen, T., et al., Bachelor of nursing students' attitudes toward teamwork in healthcare: The impact of implementing a teamSTEPPS(R) team training program - A longitudinal, quasi-experimental study. Nurse Educ Today, 2022. 108: p. 105180.
22. Liu, H.Y., et al., Predictors of individually perceived levels of team creativity for teams of nursing students in Taiwan: A cross-sectional study. J Prof Nurs, 2021. 37(2): p. 272-280.
23. Liu, H.Y., et al., Conflict and interactions on interdisciplinary nursing student teams: The moderating effects of spontaneous communication. Nurse Educ Today, 2020. 94: p. 104562.
24. Nieuwoudt, L., A. Hutchinson, and P. Nicholson, Pre-registration nursing and occupational therapy students' experience of interprofessional simulation training designed to develop communication and team-work skills: A mixed methods study. Nurse Educ Pract, 2021. 53: p. 103073.
25. Powers, K., et al., Interprofessional student hotspotting: preparing future health professionals to deliver team-based care for complex patients. J Prof Nurs, 2022. 38: p. 17-25.
26. Frenzel, J.E., et al., Measuring health care students' attitudes toward interprofessional learning, perceptions of effectiveness as an interprofessional team member, and competence in managing adult cardiac arrest. Curr Pharm Teach Learn, 2019. 11(11): p. 1178-1183.
27. Kaminski, A.D., et al., Team-Based Learning in the Surgery Clerkship: Impact on Student Examination Scores, Evaluations, and Perceptions. J Surg Educ, 2019. 76(2): p. 408-413.
28. Paige, J.T., et al., Improvement in student-led debriefing analysis after simulation-based team training using a revised teamwork assessment tool. Surgery, 2021. 170(6): p. 1659-1664.
29. Chen, M.-H. and S. Agrawal, Do communication barriers in student teams impede creative behavior in the long run?—A time-lagged perspective. Thinking Skills and Creativity, 2017. 26: p. 154-167.
30. Christensen, M., K. Medew, and J. Craft, "Nursing Tree Time": An inter-professional team approach to supporting student nurse learning at a regional university campus. Nurse Educ Today, 2019. 80: p. 22-27.
31. Elliott, N., K. Farnum, and M. Beauchesne, Utilizing Team Debate to Increase Student Abilities for Mentoring and Critical Appraisal of Global Health Care in Doctor of Nursing Practice

Programs. J Prof Nurs, 2016. 32(3): p. 224-34.
32. Ginting, H., et al., The effect of outing Team Building training on soft skills among MBA students. The International Journal of Management Education, 2020. 18(3).
33. Hallin, K., et al., High-fidelity simulation: Assessment of student nurses' team achievements of clinical judgment. Nurse Educ Pract, 2016. 19: p. 12-8.
34. Petkova, A.P., M.A. Domingo, and E. Lamm, Let's be frank: Individual and team-level predictors of improvement in student teamwork effectiveness following peer-evaluation feedback. The International Journal of Management Education, 2021. 19(3).
35. Plemmons, C., M. Clark, and D. Feng, Comparing student clinical self-efficacy and team process outcomes for a DEU, blended, and traditional clinical setting: A quasi-experimental research study. Nurse Educ Today, 2018. 62: p. 107-111.
36. Rod, I., N.M. Kyno, and A.L. Solevag, From simulation room to clinical practice: Postgraduate neonatal nursing students' transfer of learning from in-situ resuscitation simulation with interprofessional team to clinical practice. Nurse Educ Pract, 2021. 52: p. 102994.
37. Peeters, M.J., et al., A team-based interprofessional education course for first-year health professions students. Curr Pharm Teach Learn, 2017. 9(6): p. 1099-1110.
38. Falter, R.A., M.R. Ealey, and K.A. Carroll, Evaluation of modified team-based learning activities on student performance on therapeutic assessments. Curr Pharm Teach Learn, 2018. 10(8): p. 1097-1103.
39. Elisabeth, C., P. Ewa, and W.H. Christine, The team builder: the role of nurses facilitating interprofessional student teams at a Swedish clinical training ward. Nurse Educ Pract, 2011. 11(5): p. 309-13.
40. Harerimana, A. and N.G. Mtshali, Using Exploratory and Confirmatory Factor Analysis to understand the role of technology in nursing education. Nurse Educ Today, 2020. 92: p. 104490.