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The Study on Applying Cooperative Learning Approach to Analyze the Effectiveness of a Labor Education Course in Higher Education

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Abstract

The study aims to explore the learning effectiveness of labor education courses affected by cooperative learning teaching method in higher education. The target population was students at a university in Taiwan who were enrolled in a course on "Industrial Relations and Workplace Ethics". The study incorporated a cooperative group learning model, collected data on teaching and learning experiences, and conducted a study on teaching and learning in order to construct a labor education program with good teaching quality and learning effectiveness. The results of the study showed that students' learning engagement, motivation and attitude, cooperative skills and peer interaction, teacher-student relationship, and labor knowledge improved significantly after the adoption of cooperative group learning. Therefore, cooperative group learning is a good teaching method for university courses. At the end of this study, we propose specific recommendations based on the study results for teachers, schools, and future research.

Keywords

Cooperative Learning, Learning Engagement, Labor Education

1. Introduction

Nearly half of Taiwan's population is composed of laborers. Due to the influence of the past social environment, the concept of labor awareness is generally weak, and there is a lack of awareness of labor-related rights and obligations. Most workers are negligent in exercising their basic labor rights and ignore the value of labor. In order to make the value of labor widely known to the general public, it is crucial to popularize and implement labor education, which is more effec-

tive when it starts from school education. Through the teaching and learning process, university students, who are important human resources for the country's future, can internalize the concepts of respect for labor, labor human rights, labor law, and labor ethics into their values and attitudes towards life. This will not only contribute to personal career development and promote the balance of labor rights and interests but also improve the overall quality of life of the society in line with the transformation of economic development, thus achieving the ultimate goal of implementing labor education (Chen & Xie, 2020; Lin, 2014).

In order to make labor awareness more realistic in the workplace, in 2016, the Ministry of Labor of Taiwan announced that "Work Ethics and Professional Ethics" and "Occupational Safety and Health" have been included as common subjects in the subject tests of the Technician Skill Test for each category. In the "Curriculum Guidelines of 12-Year Basic Education" established by the Ministry of Education of Taiwan in 2018, labor participation, labor relations, individual labor rights, collective labor rights, labor contracts, dignity of labor, and labor market are also included in the curriculum. Therefore, it is necessary to offer "labor education" courses in universities for students to take.

In recent years, the diversity and complexity of students' learning needs have been increasing under the trend of universal higher education. University teachers face more challenges in improving their teaching effectiveness to meet students' learning needs and problems. Therefore, the issue of university teachers' teaching has been widely discussed and emphasized (Cabral & Huet, 2011; Huang, 2017; Varid & Quin, 2011). The traditional teaching method is a unidirectional lecture by the teacher to transfer knowledge, which is teacher-centered and has the problems of failing to consider students' individual learning differences, insufficient teacher-student interaction, passive learning, and failure to provide students with practical learning experiences and abilities (Bristol, 2014; Fwu, 2013; Myers, Monypenny, & Trevathan, 2012). In the current educational setting, due to the development of technology, the abundance of information on the Internet, and the popularity of mobile devices, university students tend to shift their attention to digital products such as cell phones during class. The traditional classroom lecture method has been difficult to attract the attention of modern students.

In order to increase students' engagement and motivation, teachers need to adjust their teaching strategies. Among many teaching strategies, "cooperative group learning" is a multi-functional teaching strategy that helps increase students' motivation, enhance students' learning achievement, develop cooperation and communication skills, increase students' self-esteem, and promote adaptive development (Chang et al., 2013). Therefore, this study adopts a "student-centered" cooperative group learning model to promote student interaction and group cooperation through heterogeneous grouping, providing students with opportunities for active thinking, mutual discussion, and practical group exercises. Each group member is not only responsible for his or her own learning but also has to help fellow group members learn to increase motivation

and participation and solve problems in the teaching field. This study adopts an action research approach to investigate whether students' learning commitment, motivation and attitude, cooperative skills and peer interaction, teacher-student relationship, and labor knowledge achievement improve after the inclusion of group cooperative learning to construct a good teaching model for the labor education curriculum.

2. Literature Review

2.1. Action Research

Action research is an effective way for practitioners to clarify and solve practical problems, combining "action" and "research" and emphasizing the practicality of research. Teachers study their actual teaching in the teaching field, identify problems and generate reform proposals from their actions, and strive to complete practical improvement of teaching and curriculum to solve problems. This action can contribute to the depth and breadth of professional understanding and professional development of teachers to bridge the gap between theory and practice (Huang & Yu, 2017; Tsai, 2013).

The main feature of action research is that it has a spiral research cycle that consists of four consecutive steps: plan, act, observe, and reflect, with each cyclical result leading to the next cyclical research (Atweh, 2000; Lee, 2014). Action research consists of seven procedures: finding a research question, reading related literature, developing a research plan, collecting and analyzing data, revising the research plan, presenting a research report, and sharing experience. In addition to teaching, teachers should also be action researchers. In the teaching field, teachers should constantly reflect on themselves and observe the results of teaching and adjust their teaching methods accordingly (Pan, 2014; Yeh, 2017). In order to create a more appropriate learning environment, enhance students' motivation, and improve the quality of teaching and learning atmosphere, educational action research can use scientific methods to solve the problems found in actual teaching.

2.2. Cooperative Learning

2.2.1. The Meaning of Cooperative Learning

Cooperative learning emphasizes learner-centered learning, providing students with opportunities for active thinking, mutual discussion, and practical exercises in small groups. Group members are not only responsible for their own learning but also for helping other group members learn to achieve the goal of "mutual benefit". Cooperative learning is not a single teaching strategy but a general term for all teaching strategies that promote group cooperation and student interaction. Compared to competitive or individual learning, cooperative learning is more effective in enhancing students' learning achievement, motivation, and communication skills (Johnson & Johnson, 1999; Slavin, 1995; Wang & Chang, 2003). Due to the large number of students in school, it is necessary to divide

students into groups to promote closer interaction and team participation among students, also called "cooperative group learning".

Johnson & Johnson (1999) argued that cooperative learning should include five major elements listed below.

1) Positive interdependence

Group members must support and assist each other in learning and emotion, and group goals must be achieved through mutual cooperation. Lower-achieving learners will do their best to benefit the group, while higher-achieving learners will help other group members complete their work to maintain high-quality results.

2) Individual accountability

Group members must do their part to improve the learning effectiveness of the whole group and achieve common goals.

3) Cooperative skills

Group members use appropriate cooperative and interpersonal skills to resolve conflicts that arise in the course of cooperative discussions.

4) Face-to-face interaction

Students interact with each other face-to-face to help them understand each other's ideas and improve learning effectiveness through mutual discussion, observation, and assistance.

5) Student reflective

In the process of group discussion, group members reflect on themselves, understand the problems that arise during the group discussion, and think together about the solutions.

Collaborative problem solving is a key skill that learners need in school and the workplace, and collaboration leads to problem-solving through shared understanding, coordinated action, and reflection; in fact, much work is done in teams, too (Brannick & Prince, 1997; National Research Council, 2011). Cooperative learning is a great way to develop teamwork skills for post-secondary work. Many researchers have used cooperative learning as a connotation to design-related inquiry learning, project-based learning activities, or problem-based learning to guide students in their learning. The instructor guides the methods and techniques of grouping and managing cooperative learning so that students can cooperate with each other and have individual performance and responsibility to stimulate interest in cooperative learning. Groups can collect data from different sources, communicate and discuss with each other through an interactive platform, and follow the problem-solving steps to solve problems using cooperative learning methods, which can effectively enhance learning effectiveness and develop problem-solving skills (Hung, Hwang, Lin, Wu, & Su, 2013).

2.2.2. Cooperative Learning Strategies

Cooperative learning members must work together to discuss, clarify, investigate, think about, and solve problems or learning materials to achieve the purpose of learning. Cooperative learning strategies can be divided into three major orientations depending on the teaching context in which they are applied.

1) Sharing and discussion: emphasize the exchange of learners' experiences, perspectives, or ideas, and is suitable for facilitating peer-to-peer sharing and discussion.

2) Mastery: emphasizes learners' mastery of the material and is used to help learners master the content of the lesson.

3) Inquiry orientation: emphasizes learners' inquiry into a particular topic, problem-solving, or task achievement and is suitable for guiding groups to explore the topic (Johnson, Johnson, & Stanne, 2000).

However, for cooperative learning to be successful, it requires a number of necessary conditions, such as the interdependence of team members' goals, the ability to help others achieve their goals, the establishment of a performance system, collective decision-making, and ensuring that team members have cooperative skills, including leadership, communication, and mutual respect (Gillies, 2016). Depending on the nature of the teaching units, student teams achievement divisions, teams games tournaments, and learning together methods were used in this study (Chang, 2014; Wang, & Chang, 2003), as described below.

1) Student Teams Achievement Divisions, STAD

Students are placed in heterogeneous groups based on academic achievement. They are allowed to work in heterogeneous groups to refine the content taught by the teacher through peer assistance and encouragement (Marjo, 2022; Saragih, 2021). Each student is expected to learn the content and is given a test to complete independently, without mutual assistance. STAD is similar to the lecture process in that the teacher's instruction is minimally altered and applies to almost all areas of learning, especially when the material involves unfamiliar content and requires clear explanations by the teacher. The STAD process can be divided into five main activities: whole-class instruction, grouping, in-class testing, individual progress scores, and group praise (Slavin, 1995), which are described below.

a) Class presentations: STAD begins with a whole class presentation in which the teacher teaches the class directly, and the teacher must clearly explain the objectives and meaning of learning.

b) Teams: The teacher divides students into heterogeneous groups according to their prior knowledge, learning ability, psychological characteristics, gender, or other background factors. After the class is taught, the teacher will provide learning sheets or learning materials, and the group will study the sheets or learning materials through joint discussion. When members make mistakes, they need to correct each other to establish correct concepts.

c) Quizzes: Teachers administer quizzes to assess the effectiveness of students' learning, and students use individual quizzes to understand the results of their learning.

d) Individual improvement scores: the student's prior knowledge score at the beginning of the semester is used as the basic score, and each test is converted into an improvement score by the extent to which it exceeds the basic score, and the group score is the average of each member's improvement score.

e) Team recognition: the teacher calculates the progress of the group members and recognizes the top groups that have made the most progress.

2) Teams Games Tournaments, TGT

The Small Group Game Competition (TGT) design is very similar to the Student Small Group Achievement Differentiation (STAD) method, in which heterogeneous grouping, instructional structure, and learning sheets are the same. The difference is that TGT uses a learning competition rather than a randomized test. In the case of group learning, heterogeneous grouping is used, and in the case of game competition, homogeneous competition is used.

3) Learning Together, LT

LT is a heterogeneous group of two to five students who work together according to a learning list assigned by the teacher, and each group submits a learning list representing the results of their efforts, which is used as the basis for group rewards (Ridwan & Samsul, 2022). Special emphasis is placed on team building before learning together and on the group process during group operation. Students are expected to work together to accomplish learning tasks through cooperative learning (Buchs, Dumesnil, Chanal, & Butera, 2021; Johnson & Johnson, 1994). Group members share resources, help each other, and are rewarded when their overall or individual performance reaches a pre-determined standard. The relationship between groups can be either competitive or cooperative, as determined by the teacher. The teaching process has four main stages.

a) The teacher explains the learning task: explaining the content and method of the assignment.

b) Students learn together: students learn cooperatively.

c) The teacher visits the groups and intervenes at the right time: the teacher observes the students' learning and cooperative skills and intervenes at the right time to help them.

d) Evaluation and Reflection: The group learning is integrated and evaluated to reflect on and review the cooperative learning skills.

To sum up, student teams achievement divisions, teams games tournaments, and learning together methods were used in this course. Students are guided to learn in cooperative groups, where group members discuss and grow together to improve themselves, help fellow group members learn, and explore practical problems together.

3. Research Methods

In this study, a total of 53 students from the "Labor Relations and Workplace Ethics" course in the field of social sciences were used as the target population for the study, and the action research method was adopted. The first phase of the course was held from weeks 1 to 4, and the traditional lecture method was used. The students were divided into heterogeneous groups in the first week of the course.

In the second phase, the researcher used a variety of cooperative group learning teaching strategies, including co-learning, group game competitions, and group inquiry methods. The curriculum was revised and adjusted during the course using group learning sheets, student feedback, and teachers' teaching journals. In the final week, students engaged in learning, cooperative group learning, and post-testing of labor skills.

The research instruments include quantitative instruments such as the Engagement in Learning Scale, the Group Cooperative Learning Experience Scale, and the Labor Knowledge Test, and qualitative instruments such as the Group Learning Sheet, the Teaching Feedback Form, and the Teaching Reflection Journal. Among them, the Learning Engagement Scale and the Grouped Cooperative Learning Experience Scale are designed with a Likert-type 5-point scale, in which students are given a score of 5 to 1 according to their own status by checking the boxes of fully agree, mostly agree, partially agree, mostly not agree, and not agree at all. The higher the number, the higher the degree of compliance. The scale contains the following components.

3.1. Learning Engagement Scale for College Students (LESCS)

The Learning Engagement Scale for College Students (LESCS) was used in this course to measure students' engagement in learning (Lin & Huang, 2012). LESCS has a total of 20 items, including five dimensions.

1) Skills: it consists of 4 items to evaluate students' ability to use methods to remember the main points of the material and course content.

2) Emotional: it consists of 5 items to evaluate how well students get along with their classmates and teachers at school.

3) Performance: it consists of 4 items to evaluate students' absence and concentration in class.

4) Attitude: it consists of 4 items to evaluate students' commitment and involvement in learning the course.

5) Interaction: it consists of 3 items to evaluate students' interaction with classmates and teachers in the classroom.

3.2. Group Cooperative Learning Experience Scale

In order to understand the situation of students' cooperative learning in groups, this study used the "Group Cooperative Learning Experience Scale" as a research tool to conduct a pre-test and a post-test to understand students' cooperative learning in groups (Chang et al., 2015). The scale consists of 18 items, including three dimensions.

1) Motivation and attitude: it consists of 7 items to evaluate students' interest, confidence, and learning effectiveness.

2) Cooperative skills and peer interaction: it consists of 8 items to evaluate students' cooperation and interaction with peers.

3) Teacher-student relationship: it consists of 3 items to evaluate students' feelings and interpersonal relationships with teachers.

4. Research Results and Discussion

In the first 4 weeks, the traditional lecture method is used, with lectures as the main focus and questions as a supplement, to lay the foundation for the course content. In the fifth week, various cooperative group learning strategies are used. The students can achieve the best learning outcomes through problem discussions, group work, case studies, practical exercises, and presentations.

After integrating cooperative group learning, the researcher observed that students could participate in discussions, write study sheets, present on stage, and give feedback. A dependent sample t-test was used to analyze the differences in students' learning engagement, group cooperative learning, and labor knowledge pre-test and post-test. The research results are as follows.

4.1. Learning Engagement Status

The Learning Engagement Scale comprises five components: skills, emotion, performance, attitude, and interaction. The mean scores of effects, performance, attitude, interaction, and learning engagement as a whole were significantly better in the post-test than in the pre-test. Although there was no significant improvement in the skill component, the post-test mean was higher than the pre-test. The overall learning engagement of the students increased significantly after the integration of cooperative group learning, as shown in Table 1.

4.2. Group Cooperative Learning Experience

The group cooperative learning experience scale was divided into three components: motivation and attitude, cooperative skills and peer interaction, and the teacher-student relationship. Compared to the pre-test, the mean scores of each component and the overall group cooperative learning experience were significantly improved in the post-test. The students' learning effectiveness was significantly improved after integrating cooperative group learning, as shown in Table 2.

Table 1. Comparison of pre-test and post-test of learning engagement.

Dimensions	post-test		pre-test		t
	Mean	Standard Deviation	Mean	Standard Deviation	
skill	4.25	0.57	3.96	0.77	1.727
emotion	4.27	0.58	3.77	0.71	3.343**
performance	4.52	0.62	4.04	0.65	2.904**
attitude	3.92	0.76	3.42	0.85	3.156**
interaction	3.96	0.83	3.27	0.88	3.952**
Total	4.20	0.56	3.72	0.67	3.352**

**$p < 0.01$.

Table 2. Comparison of pre-test and post-test of group cooperative learning experience.

Dimensions	post-test		pre-test		t
	Mean	Standard Deviation	Mean	Standard Deviation	
Learning Motivation and Attitude	4.13	0.22	3.71	0.23	6.991***
Collaboration skills and peer interaction	4.28	0.29	3.87	0.37	5.743***
Teacher-Student Relationship	4.05	0.24	3.76	0.25	5.995***
Total	4.18	0.22	3.79	0.28	7.344***

***$p < 0.001$.

Table 3. Comparison of pre-test and post-tests of labor knowledge.

Dimensions	post-test		pre-test		t
	Mean	Standard Deviation	Mean	Standard Deviation	
Labor Knowledge	87.31	6.36	52.69	11.16	20.267***

***$p < 0.001$.

4.3. Labor Knowledge

The mean score of the post-test was 87.31, and the mean score of the pre-test was 52.69, with a difference of 34.62 points and a significant difference (t = 20.267, $p < 0.001$), as shown in Table 3. Therefore, the cooperative learning teaching method can effectively improve students' labor knowledge.

This study's cooperative learning approach is based on the teacher assigning students with different characteristics to the same group according to the teaching plan and then setting cooperative tasks according to the teaching objectives and units. Students were encouraged to share and integrate their learning responsibilities through multiple approaches. Finally, through continuous communication and mutual support, group members worked hard to accomplish the set learning goals and share the common learning outcomes. The results of the above data analysis showed that the mean scores of the affective, performance, attitude, and interaction components of the Engagement in Learning Scale and the overall Engagement in Learning Scale were significantly higher in the post-test than in the pre-test. The mean scores of the group cooperative learning experience scale were significantly higher in the post-test than in the pre-test. The mean scores of the post-test were also significantly higher than those of the pre-test. Therefore, the results of the study showed that students' learning engagement, group learning experience, and workforce performance improved significantly after adopting cooperative group learning. According to Slavin (2014), cooperative learning can liven up learning, allowing students to work together instead of competing, and students learn more effectively. Moreover, Wang, Lu & Chang (2021) indicated that cooperative learning can revitalize instruction

and increase students' interest and participation in learning. Many studies have also shown that students in cooperative learning environments have better learning outcomes, more positive relationships with classmates, and better relationships with teachers than in competitive learning environments (Baloche & Brody, 2017; Chang, 2014; Gillies, 2016; Roseth, Johnson, & Johnson, 2008). The results of this study echoed previous research in that students' cooperative learning has a substantial impact on task completion, improving learning performance and outcomes. As with Vygotsky's theory of cognitive development, instruction should consider the differences among learners (Gredler, 2012). Through cooperative learning in groups, a caring and positive environment can be created between the instructor and the learners, adding positive emotional cooperation between "teaching" and "learning". In contrast, learning is the essence of student "development", which is facilitated through social interaction and shared learning.

5. Conclusion and Recommendations

5.1. Conclusion

5.1.1. Cooperative Learning Enhances Students' Engagement in Learning

The results of the study showed that after the adoption of cooperative group learning, students' learning engagement in terms of emotion, performance, attitude, and interaction, the post-test mean of the overall learning engagement was significantly higher than those in the pre-test. Although there was no significant improvement in the skill dimensions, the post-test mean was higher than the pre-test. This shows that group learning can improve students' engagement in learning. The standard deviation of the post-test was smaller than that of the pre-test, which means that group cooperative learning can reduce the gap in students' learning engagement.

5.1.2. Cooperative Learning Promotes Good Learning Experiences for Students

After the adoption of cooperative group learning, students' motivation and attitude, cooperative skills, peer interaction, and teacher-student relationship, the overall mean of the post-test in the group cooperative learning experience was significantly higher than in the pre-test. This shows that group cooperative learning can promote good learning experiences for students. The standard deviation of the post-test was smaller than that of the pre-test, indicating that cooperative group learning can reduce the gap in positive learning experiences for elementary students.

5.1.3. Cooperative Learning Improves Students' Labor Knowledge

After adopting cooperative group learning, the mean scores of students' labor knowledge in the post-test were significantly higher than in the pre-test. It can be seen that group cooperative learning can effectively improve students' labor knowledge. The standard deviation of the post-test was smaller than that of the

pre-test, indicating that group cooperative learning could reduce the gap in students' labor knowledge.

5.2. Recommendations

5.2.1. Suggestions for Teachers and Schools

1) Enhance the training of students' learning skills

The results of the Learning Engagement Scale showed that the mean scores of the four post-tests of effect, performance, attitude, and interaction were significantly better than the pre-tests. The average score of the post-test of the "skills" was also higher than those in the pre-test, but the score was not significant enough. The questions included taking good notes to remember the main points of the textbook, using the methods and knowledge learned to complete assignments, marking the main points of the textbook, and using various methods to understand the content of the lectures. Therefore, in future courses, more attention should be paid to the training of students' learning skills when using the cooperative learning method.

2) Promote the use of cooperative learning in the curriculum

The study results show that cooperative learning can enhance the learning effectiveness of university students, but only a few university courses in Taiwan are currently using cooperative learning. It is recommended that universities hold more presentations or seminars on cooperative learning approach to encourage teachers to apply cooperative learning approach in their courses. Collaborative learning must be practiced in the "right place at the right time" to be fully effective in teaching (Jolliffe & Snaith, 2017; Surian & Damini, 2014). Therefore, depending on teachers' professional backgrounds and needs, we can expand and promote cooperative learning in various fields and subjects so that the teaching strategy of group cooperative learning can be flexibly applied in each curriculum according to different teaching purposes and needs.

3) Offer more labor education courses

Most of the students in Taiwan are engaged in the workplace right after they graduate from college or even take part-time jobs while they are still in college. Most of the students' feedback is that this course is very practical, and they understand many problems they may encounter in the workplace and their labor rights and obligations. They hope to have the opportunity to take similar courses in the future to learn more about the workplace. Therefore, it is suggested that universities should offer more courses on labor education to enhance students' labor knowledge and literacy, which will be helpful for practical application in the workplace.

5.2.2. Suggestions for Future Research

1) Expanding the study subjects

It is recommended that future research on cooperative learning be conducted with a broader target population. In addition to classroom-based implementation, it is possible to target students in curriculum areas, grade levels, and even

across schools.

2) Extended study time

It is suggested that subsequent researchers can extend the implementation period of the cooperative learning method, such as selecting a suitable curriculum for a year of teaching research and conducting continuous observations and tests on the research subjects at different points in the study to investigate the effectiveness of students' learning over time and to further understand whether students' attitudes toward cooperative learning and classroom performance change over time to obtain more complete research results.

3) Experimental group/control group quasi-experimental study

In addition to comparing the pre and post-tests of a single class, subsequent researchers can also arrange experimental and control groups between different classes to compare the results of the teaching experiment. This will help develop cooperative learning research by comparing the learning effectiveness of cooperative learning approach with traditional narrative teaching methods and by obtaining different research results.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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