

Development of Learning Methods Combining Cooperative Based Learning and Problem-Based Learning in Improving the Effectiveness of Advanced Financial Management Learning

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ABSTRACT

Education plays a very important role in improving the quality of human resources. In higher education, students need learning that is innovative and not monotonous so that learning goals can be achieved. In this research, what will be discussed further is the development of learning methods by combining 2 methods, namely Cooperative Based Learning (CBL) with Problem-Based Learning (PBL) in the Advanced Financial Management course. This research method uses Pretest - Posttest Design. The data population is 711 students collected from 17 classes taking Advanced Financial Management courses at Putra Indonesia University YPTK Padang. The sampling technique uses probability sampling. The data that will be used as a sample are observations of 117 students collected from 3 classes. The CPBL method is implemented by grouping students into groups of 4-5 people to discuss each case in the material. Data will be analyzed based on the completeness of learning outcomes and calculating N-Gain. From the data processing, the results obtained were that by combining these 2 methods, it was successful in improving student learning outcomes and the students' completeness test scores were also proven to be very successful in being upgraded. The effectiveness of the collaboration between these 2 methods reaches the high category of the N-Gain test. This is a new variation in making learning calculations that use many formulas more challenging, increasing students' enthusiasm for learning and providing satisfactory learning results. This method is worth utilizing and can be used in all courses that involve calculations and case questions.

Keywords: Advanced Financial Management, Cooperative Based Learning, Learning Methods Combination, Problem Based Learning

INTRODUCTION

Education is a human right and has an important role to play in improving the quality of human resources. Every human being has an equal right to education, while education has a goal that must be achieved as the goal of education. National educational objectives can be achieved through learning activities in schools, colleges or in formal education (Musalamani, Yasin & Osman, 2022). Learning activities are teaching activities carried out by students with teachers in class, when the context is in college, then learning activities are learning interactions that occur between students with lecturers in the learning process (Darma, Karma & Santiana). (2020). The interaction that occurs between the student and the lecturer in the learning process will result in student learning activity.

Learning activities at universities are carried out with different methods or models for each level of education and for each occurrence of the learning process. (Tanuwijaya & Tambunan, 2021). The method or model of learning is one of the capital of a lecturer in improving the student's learning activity at the time of the course of the learning process. (Pritandhari, 2017). However, sometimes the method or model of learning applied by a lecturer in the process of learning to a particular material does not correspond to the

purpose of learning and the characteristics of such material, so can not improve student learning activity even make students saturated in learning. In addition, students become passive because they can only receive material given by the lecturer without actively participating in supporting the teaching learning process in the classroom while the learning process is in progress. (Febrilia, dkk, 2020). As a result of the application

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of learning methods or models that do not correspond to the purpose of learning as well as specific material characteristics can make the student's learning activity low and limited. When in the learning process students pay less attention to the instructor's explanations, less interaction and communication with the instructors and less active participation in the process of learning in the classroom, indicates that the student's learning activity is still low.

In connection with the discussion on student learning activities, the following data are the student learning activity at the time of the teaching learning process, as a pre-research observation conducted at the Management Departure, Faculty of Economics and Business of Putra University of Indonesia YPTK Padang with a sample of student semester 4, Class M-5 in Advanced Financial Management courses. At the time the observation was conducted, the number of students present was 37 students out of 38 students of Class Management 5 who took the course. Students' learning activity is still low. Students tend to be passive and less active in the learning process. The phenomenon of low student learning activity is a problem that needs to be solved. When the student's learning activity is low, it will hinder the learning process of teaching in the classroom. In addition, in the learning activities need to be activity, so that can be created a good teaching learning process.

Based on the above analysis, low student learning activity cannot be left alone because it will have a very negative impact. The impact will be experienced by students among them, students becoming lazy and less enthusiastic in learning, students become lazy in doing and thinking in class, students do not participate actively in learning in class as well as the material provided by the lecturer will not be easily understood by students, so as a result the teaching learning process will not go well and the learning objectives will not have been achieved including difficulties in further learning. Therefore, there is a need for research on still low learning activity so that we can find a solution to the problem.

Cooperative based learning (CBL) developed by Johnson and Johnson (1990), can be defined as a structured form of group work (Millis, 2010). According to Millis and Cottell (1998), the key principles of CBL in higher education include (i) positive interdependence, that is, that group members need to work together to accomplish tasks, and have shared benefits and common goals, and (ii) individual accountability, i.e. each group member is responsible, thus preventing social laziness. Thus, groups should be relatively small, consisting of three to five students, to avoid free-riding behavior that allows less open students to participate, and generally enhance learning. (Kagan, 2021).

Groups should be formed by teachers taking into account their heterogeneity. Heterogeneity is consistent with the

degree of diversity that characterizes members of the group in terms of gender, ethnicity, previous academic background, skills, preferences or preferences (Kagan, 2021). The stages to be used by teachers in this method of learning are Assessment and Supplement. (Atxurra et al., 2015). Assessment refers to the clarity of the assessment system, its adequacy to the learning-teaching methodology, correct information about its criteria and is a fair system. Mentoring is a tool available to teachers to keep up with the learning-teaching process (Fauchald et al., 2022), so that they can plan the goals and tasks that the working group wants to and so that all members know and understand the activities that are undertaken and the means available to them to carry them out. This will lead to interdependence, perspective-taking, and case argumentation, knowledge and level of autonomy of both low and high student abilities (Jacobs et al., 2006), and the quality of group discussion and group performance (Curs, eu et al. 2018). Furthermore, the use of CBL structures helps students complete tasks in accordance with CBL principles. Since the CBL structure is a content-free strategy (Kagan, 2021), they can be used in any subject and at any educational level, including higher education.

In higher education most CBL studies have been associated with the first of these three categories and in particular with higher academic achievement of students (Loh & Ang, 2020). The relationship between CBL and academic accomplishment is thoroughly embedded (Børve et al., 2021; Deng et al, 2021; Handel et al. 2020; Lederer et al.; 2021; Phillips and al., 2022; Sivertsen, 2021). Previous studies on CBL show that CBL in a physical learning environment can be positively linked to a variety of learning outcomes. (Canelas et al., 2017; Espinosa et al., 2019; Furuto, 2013, 2017; Pilcher et al., 2015; Rattanatumma & Puncreobutr, 2016; Rivera, 2013; Wilton et al., 2019; Yapici, 2016). However, as far as we know, these studies are only few, have been carried out in educational environments different from ours, or have not yet explored CBL methods in learning settings fully. So, in this intervention study we applied CBL methods combined with Problem based learning. (PBL).

With the combination of these methods, the researchers intended to create a situation of contrast between what students knew and what they knew what they had to learn, arousing students' doubts and interest in the questions presented to them and trying to open them up to learning in a cooperative way in a dialogue and didactic communication environment. In addition, the use of some visual thinking methodologies facilitates the creation of mind maps, one of the forms of visualization most widely used by entrepreneurs for problem-solving and idea-making (Hayati & Umer, 2018).

Problem Based Learning (PBL) is an inductive learning approach that uses realistic problems as a starting point for learning (Mohd-Yusof, et al, 2011). As a student-centered instructional approach, PBL primarily directs student involvement in group learning to solve unclear and unclear open-ended problems by using the following learning steps: analyzing the problem, setting goals, gathering resources, summarizing ideas, and reflecting problem solving experience (Lin et al., 2010).

PBL can be categorized into two types based on the place of study. (a) Scenario-PBL has strict requirements that the problem must originate from real life, be implemented in a real life situation, and be solved ultimately. (b) PBL-cases are stories generated from real life to be compiled into scripts for students to discuss in class. In addition, based on these interactions, PBL can be categorized into collaborative PBL and individual PBL (Suebunukarn & Haddawy, 2006). However, for all studies in this meta-analysis, they adopted both case PBL and collaborative PBL because they conducted classroom interventions with student interactions. Thus, they are given the name PBL in general in this research. In addition, the characteristics of PBL in this research are based on Savery's (2015) summary: Tutoring is mostly by students; open investigation of authentic cases; problems related to subjects; collaboration; reflection; teacher instructions. Authentic cases are demonstrated to students, first, to identify the problem, and then conduct an informative exploration of it. During this process, students can strengthen their knowledge of problem identification (step one).

Based on possible solutions resulting from synthesizing the information, students will conduct collaborative discussions to select the best answers and present them to peers and other educators. According to the feedback, the final solution will be identified with the newly acquired knowledge. Meanwhile, interactions between individuals, colleagues, and instructors exist throughout the procedure. Teaching can be a challenging task especially when students are categorized as reluctant readers, low in self-motivation and lacking critical thinking skills. Therefore, a successful problem-based learning approach in universities called 'Literature for Language Purposes' was taken by Bachelor of English with Communication students in a local Malaysian university which aimed to investigate the impact of implementing problem-based learning in teaching literature. Findings show that problem-based learning is suitable and useful in teaching and improving critical thinking skills (Rahman, et al, 2016). The application of this model has been carried out successfully in physics courses (Suana, et al, 2017; Celik, Onder & Silay, 2011), gas studies (Bilgin, Şenocak, Sözbilir, 2009) and health (Zhang, et al, 2015).

METHOD

Research Design

This type of research is experimental research (Quasi Experimental Research) with the form of research design used is One Group Pretest-Post test Design. Suryabrata (2014) explains "Execution of experiments using single group design with pretest-post test is done by experimenting with one group, without using comparison groups".

Population and Sample/ Study Group/ Participants

The research was carried out on students of the 4th semester of Management in the Advanced Financial Management course at University of Putra Indonesia YPTK Padang academic year 2022/2023. Population is a generalization region consisting of objects/subjects that have certain qualities and characteristics that the researcher defines to be studied and then draws conclusions. (Sugiyono, 2018). The population in the study is 711 students out of a total of 17 classes taking Advanced Financial Management courses.

Sampling is a probability sampling technique wherein this technique gives equal chances to every member of the population to be selected as a member of a sample (Sugiyono, 2019). This technique is a method of taking a sample member from a population that is performed randomly without regard to the layers that exist in that population. (Sugiyono, 2019). The samples selected in the study are as many as three classes. A total of 117 students. The students in the class are composed of different areas and have different levels of ability to understand the materials taught, some students are slow in understanding the materials while some others are fast enough in understanding them. Besides, some are very active in learning while some are not very active even dare to submit opinions or answer questions of the lecturer in the learning process. It is supported by the material characteristics of the Advanced Financial Management course, which requires a good analysis and understanding to apply the concepts and formulas in the course as well as the existence of the correlation between one material with another so that to understand the subsequent material students are required to understand well the material at the previous meeting.

Data Collection Tools

This research is development research. The development of a learning model using a combination model of cooperative and problem based was preceded by a preliminary study in the form of a literature study and an empirical study. Next, an analysis of the needs of the study object is carried out and a learning method is prepared. Before carrying out

observations, a learning model trial was first carried out on a limited group of students, then its effectiveness was analyzed and then reflection and improvements were carried out.

The desired learning criteria are those that show learning activities and student learning outcomes are at a good level. Student learning activities are measured by observation sheets and student learning outcomes are measured by tests (quiz). Data from observations of student learning activities are used to test the reliability of the combined learning model in increasing student learning activities. Learning outcome tests are used to obtain data regarding improvements in learning outcomes before and after treatment and are used to test student learning outcomes.

Data Collection

In this study, the data used is primary data, data taken directly from the research object. Data obtained using the observation sheet. The function of the observance sheet is to see a picture of the model implementation in the classroom and to observe the student's activity during the learning process. The initial observation (pre test) is carried out at the beginning of the research or the first meeting in learning with the aim to know and measure the level of student activity before conducting the experiment using conventional methods.

The instrument in this study is an observation sheet to measure the learning activity, a test for measuring the learning outcome. The observation instrument for learning activity is structured on the basis of the indicators of learning activity and the test of learning outcomes is constructed according to the substance of the material to be studied. The test instrument to be used first analyzes the difficulty level and the completion time. Implementation of learning using learning tools in this study, conducted four meetings. At each meeting, student activity is observed by two observers using the instrument of the student activity observation sheet. The results are then accumulated. After the completion of 4 learning meetings, then given a test to measure the student's cognitive learning outcomes using a case-by-case instrument according to the material submitted by the lecturer.

In the course of the course, the teachers of the Advanced Financial Management course will carry out the learning activities with the method of combination cooperative and problem based learning at the 11th meeting until the 14th meeting. The material will be submitted according to the curriculum and RPS. The method will be cooperative learning by dividing students into several groups with members of 4-5 people in one group and problem-based learning by giving cases of matters according to matters. Examples of questions will be explained first how to solve it by the teacher then each group is asked to understand each step of solving the issue.

After that, the teacher will give 1 question of case to be solved by each group and each group will be asked to make another one question by their respective groups and finish again.

The evaluation of this learning activity will be done with a presentation of each group regarding the completion of the given issues. Completion of the issue will be explained each step by all members alternately. The understanding of this method is seen by the researcher as the lecturer to what extent the student can deliver the answer correctly and whether the student in the group has already managed to understand the material and case described by the lecturer.

Data Analysis

After the data collection is carried out, the next is data analysis. The instrumental analysis of cognitive learning outcomes will be viewed based on the test results of practice at meeting 15 and quiz at meeting 16 using a score of 0-100. After obtaining the pre-test and posttest scores, the researchers analyzed the scores obtained. The analysis used is a gain normality test. This test is used to determine the effectiveness of the given treatment. Here is the formula used to calculate the normality of gain according to Meltzer:

$$\text{Normalized Gain (g)} = \frac{\text{Posttest Score} - \text{Pretest Score}}{\text{Maximum Score} - \text{Pretest}}$$

As for the category, we can use the interpretation of the normalized Gain index (g) according to Hake's modified :

N-Gain Score (g)	:	Interpretation
-1.00 <g<0.0	:	Decrease
g=0.0	:	Stable
0.0 <g<0.30	:	Low
0.30 <g<0.70	:	Average
0.70 <g<1.00	:	High

FINDINGS

Descriptive statistical analysis is used to provide a general overview of the effectiveness of learning using the CPBL model against the learning outcomes of students of Putra Indonesia University YPTK Padang's 5th semester in Advanced Financial Management courses. Data from the descriptive statistical analysis of students' pre-test and posttest values on CPBL model learning can be seen in Table 1.

The effectiveness of learning using the CPBL model against the student's learning outcomes is determined by the size of the N-Gain value. The results of the descriptive statistical analysis in table 1 show that there is an improvement in the average learning outcome of the student

Table 1: Descriptive Statistic

	<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Pretest	117	52.76	26.25	0	100
Posttest	117	87.14	14.82	47	100

before and after learning using CPBL, where the average value of the pretest is 52.76 and the average posttest value is 87.14 with a difference of 34.38. This shows that the student has experienced a considerable improvement after receiving treatment. Furthermore, the data of the student test results before and after the application of learning using the CPBL model are categorized according to the criteria of student grades can be seen in Table 2.

Table 2: Student Test Result Criteria

<i>Value</i>	<i>Criteria</i>	<i>Pretest</i>		<i>Post Test</i>	
		<i>Freq.</i>	<i>%</i>	<i>Freq.</i>	<i>%</i>
≤ 65	Incomplete	74	63,25	15	12,82
≥ 65	Complete	43	36,75	102	87,18
		117	100	117	100

Based on Table 2, the rate of individual students who received treatment was higher than before the treatment, where the percentage of students who did the pretest increased to 36.75% to 87.18% after the test. It shows that learning using the PBL model can help students to improve their learning outcomes because one of the advantages is that the problems or difficulties that students face can be discussed with their group friends so that they can understand the lesson material to the maximum.

The purpose of N-Gain is to find out how effective the CPBL model is in relation to the learning results of the University of Putra Indonesia YPTK Padang. To determine the level of effectiveness of the application of PBL, then can be seen on the following calculations:

N-Gain	87.14	-	52.76	0.728
	100	-	52.76	

DISCUSSION

Based on the calculation of N-Gain test scores it is possible to read that the effectiveness score of the application of CPBL in the learning of Advanced Financial Management was obtained at 0.728 with the interpretation of the level of efficiency with the high category. Learning using the CPBL model can improve student learning outcomes. This is in line with research carried out by Siregar (2020) student learning

results obtained with the PBL learning model higher than with the Direct Instruction learning model. Through the application of the PBL model students will get used to facing problems and feel challenged to solve problems, not only about learning in the classroom, but also in everyday life. It is excellent building student character that is competitive especially related to the understanding of the material studied in the classroom. As with the PBL model, the cooperative learning model can create active and positive interactions as well as build group members' collaboration to be better. Students can study with other students or by peers more effectively than learning from lecturers alone.

From the results of this study can be revealed the changes and developments of the students' learning results with the presence of cooperative problem based learning, i.e. the level of accuracy of values achieved on pretest and post test. This is due to the formation of different groups in terms of gender and the level of the pretext result so that all groups have non-homogeneous members and different abilities. The compactness of each group clearly determines the success of this CPBL. Both groups also think critically about making cases that they're going to solve on their own. So it happens many times to solve issues that definitely deepen the understanding in the solution of the case. From the point of view of the accuracy of the values can be seen clearly in the table 2, besides this CPBL also increases the student's activity in learning. With the task for each group to make questions and solve cases on their own, each student becomes more active in the classroom, more often asks questions, faster in working on exercises as well as when the lecturer revisits the material, students can respond quickly about the material of the previous week. And this is a very significant increase in his activity compared to before the CPBL treatment. Although not all of the students became more active, but the inactivity status is very backward. Prior to the introduction of the CPBL, there were very few active students in the classroom, but after the implementation of the CCBL, very few were inactive students in classroom.

This CPBL has proven to be practical in a number of courses. Usually groups in the class are formed more dominantly for theoretical courses. It's very rare for a lecturer who holds counting courses such as accounting, financial management, calculus or any other counting course to form an intensive group in learning, at least just to do one group task and finish it. On the method that the researchers developed this, groups were formed in addition to working tasks but also entrusted with intensive learning until the end of the semester and all well documented by each group. In addition, to enhance the group's spirit, the lecturer gives a gift challenge to groups whose final score (post test) is above the threshold of the grades of gratification, which is above 65. So

this becomes one of the tricks in learning. Besides, it's a form of reward for students anyway. And learning is more relaxed, not rigid but still serious and focused on the outcome. This is in line with Loliyana, et.al (2022); Fauziddin, Kusumawati & Ananda (2023) that proves that giving rewards to students can improve student motivation in learning.

CONCLUSION

From the results of this study can be revealed the changes and developments of the students' learning results with the presence of cooperative problem based learning. The compactness of each group clearly determines the success of this CPBL. This CPBL has proven to be practical in a number of courses. Usually groups in the class are formed more dominantly for theoretical courses. In addition to this method there are many other methods and actions that can be taken to improve student learning results. But, of course, this method will not be applied to all students. Some of the students who did not experience an increase in learning results occurred because they did not participate in group activities besides that there was also a minimum of willingness to ask if they didn't understand. Obviously there are some exceptions for typical students like this. But of the methods that have been developed by the researchers, the CPBL methods include highly effective methods used for majority-counting materials such as accounting, finance, and others.

SUGGESTION

This method is very well implicated in learning advanced financial management. For further research, researchers will develop effective methods to memorize formulas to improve student learning results.

LIMITATION

Research still has many limitations. The research used a sample size of only 3 classes out of a total of 17 classes. Apart from being focused on just one subject, it can also be developed into other calculation subjects.

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REFERENCES

- Abd Rahman, M., Azmi, M. N. L., binti Wahab, Z., bin Abdullah, A. T. H., & binti Azmi, N. J. (2016). The Impacts of Problem-Based Learning Approach in Enhancing Critical Thinking Skills to Teaching Literature. *International Journal of Applied Linguistics and English Literature*, 5(6), 249- 258.
- Atxurra, C., Villard 'on-Gallego, L., & Calvete, E. (2015). Dise˜no y validaci˜on de la Escala de Aplicaci˜on del Aprendizaje Cooperativo (CLAS). *Revista de Psicodid˜actica*, 20(2), 339-357.
- Bilgin, I., ˙Senocak, E., & S˜ozbilir, M. (2009). The effects of problem-based learning instruction on university students' performance of conceptual and quantitative problems in gas concepts. *Eurasia Journal of Mathematics, Science and Technology Education*, 5(2), 153-164.
- Børve, K., Straume, K., Smith, R., Sur 'en, P., Samdal, O., & Hågenesen, E. (2021). Tiltak for oppfølging av studenter ved fagskoler, høyskoler og universiteter under koronoapandemien [Initiatives to follow up students in higher education during the Corona pandemic]. <https://www.regjeringen.no/contentassets/459df-2260de74e57a9f1317bd0bb492f/tiltak-for-oppfolging-av-studenter-ved-fagskoler-hoyskoler-og-universiteter-under-pandemien.pdf>.
- Canelas, D. A., Hill, J. L., & Novicki, A. (2017). Cooperative learning in organic chemistry increases student assessment of learning gains in key transferable skills.
- Celik, P., Onder, F., & Silay, I. (2011). The effects of problem-based learning on the students' success in physics course. *Procedia-Social and Behavioral Sciences*, 28, 656-660.
- Chemistry Education Research and Practice, 18(3), 441-456. <https://doi.org/10.1039/C7RP00014F>
- Curs, eu, P. L., Chappin, M. M. H., & Jansen, R. J. G. (2018). Gender diversity and motivation in collaborative learning groups: The mediating role of group discussion quality. *Social Psychology of Education*, 21(2), 289-302.
- Darma, I., Karma, I., & Santiana, I. (2020). Blended Learning, Inovasi Strategi Pembelajaran Matematika di Era Revolusi Industri 4.0 Bagi Pendidikan Tinggi. *PRISMA, Prosiding Seminar Nasional Matematika*, 3, 527-539. Retrieved from <https://journal.unnes.ac.id/sju/index.php/prisma/article/view/37580>
- Deng, J., Zhou, F., Hou, W., Silver, Z., Wong, C. Y., Chang, O., Drakos, A., Zuo, Q. K., & Huang, E. (2021). The prevalence of depressive symptoms, anxiety symptoms and sleep disturbance in higher education students during the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Research*, 301, Article 113863. <https://doi.org/10.1016/j.psychres.2021.113863>
- Dimiyati & Mudjiono. 2009. *Belajar dan Pembelajaran*. Jakarta: Rineka Cipta.
- Espinosa, T., Miller, K., Araujo, I., & Mazur, E. (2019). Reducing the gender gap in students' physics self-efficacy in a team- and project-based introductory physics class. *Physical Review Physics Education Research*, 15(1).
- Fauchald, R. N., Aaboen, L., & Haneberg, D. H. (2022). Utilisation of entrepreneurial experiences in student-driven mentoring processes. *International Journal of*
- Febriilia, B. R. A., Nissa, I. C., Pujilestari, P., & Setyawati, D. U. (2020). Analisis Keterlibatan dan Respon Mahasiswa dalam Pembelajaran Daring Menggunakan Google Classroom di Masa Pandemi Covid-19. *FIBONACCI: Jurnal Pendidikan Matematika Dan Matematika*, 6(2), 175-184.

- Furuto, M. (2013). A case study on a diverse college algebra classroom: Analyzing pedagogical strategies to enhance students' mathematics self-efficacy. [Oregon State University]. ProQuest Dissertation Publishing.
- Furuto, M. A. (2017). Mathematics pedagogical strategies to create a positive college classroom community. *Malaysian Journal of Mathematical Sciences*, 11(1), 9–21.
- Gillies, R. M. (2016). Cooperative learning: Review of research and practice. *Australian Journal of Teacher Education*, 41(3), 39–54.
- Händel, M., Wimmer, B., & Ziegler, A. (2020). E-portfolio use and its effects on exam performance—a field study. *Studies in Higher Education*, 45(2), 258–270.
- Hayati, A., & Umer, H. M. (2018). Visual thinking in entrepreneurship.
- Jacobs, G. M., McCafferty, S. G., & Iddings, A. C. D. (2006). Roots of cooperative learning in general education. In G. M. Jacobs, S. G. McCafferty, & A. C. D. Iddings (Eds.), *Cooperative learning and second language teaching* (pp. 9–17). Cambridge University Press.
- Johnson, D. W., & Johnson, R. T. (1990). Cooperative learning. Perspectives on small group learning, 3.
- Johnson, D. W., & Johnson, R. T. (1999). Making cooperative learning work. *Theory into practice*, 38(2), 67–73.
- Kagan, S. (2021). The structural approach and Kagan structures. In N. Davidson (Ed.), *Pioneering perspectives in cooperative learning* (pp. 78–127). New York: Routledge.
- Lederer, A. M., Hoban, M. T., Lipson, S. K., Zhou, S., & Eisenberg, D. (2021). More than inconvenienced: The unique needs of U.S. college students during the COVID- 19 pandemic. *Health Education and Behavior*, 48(1), 14–19. <https://doi.org/10.1177/1090198120969372>
- Lin, C. F., Lu, M. S., Chung, C. C., & Yang, C. M. (2010). A comparison of problem-based learning and conventional teaching in nursing ethics education. *Nursing ethics*, 17(3), 373–382.
- Management in Education*, 20(2), Article 100651.
- Millis, B. J. (2010). Why faculty should adopt cooperative learning approaches. In B. J. Millis (Ed.), *Cooperative learning in higher education: Across the disciplines, across the academy* (1st ed.). Sterling: Stylus.
- Millis, B. J. (2010). Why faculty should adopt cooperative learning approaches. In B. J. Millis (Ed.), *Cooperative learning in higher education: Across the disciplines, across the academy* (1st ed.). Sterling: Stylus.
- Millis, B. J., & Cottell, P. G. (1998). *Cooperative learning for higher education faculty*. Westport: American Council on Education/Oryx.
- Mohd-Yusof, K., Hassan, S. A. H. S., Jamaludin, M. Z., & Harun, N. F. (2011, April). Cooperative problem-based learning (CPBL): A practical PBL model for engineering courses. In 2011 IEEE Global Engineering Education Conference (EDUCON) (pp. 366–373). IEEE.
- Phillips, R., Seaborne, K., Goldsmith, A., Curtis, N., Davies, A., Haynes, W., McEnroe, R., Murphy, N., O'Neill, L., Pacey, C., Walker, E., & Wordley, E. (2022). Student loneliness through the pandemic: How, why and where? *The Geographical Journal*, 188(2), 277–293. <https://doi.org/10.1111/geoj.12438>
- Piaget, J. (1985). *The equilibration of cognitive structures: The central problem of intellectual development*. University of Chicago Press.
- Pilcher, L. A., Darren, L. R., Kgadi, C. M., & Potgieter, M. (2015). An inquiry-based practical curriculum for organic chemistry as preparation for industry and postgraduate research. *South African Journal of Chemistry*, 68, 236–244.
- Pritandhari, M. P. (2017). Implementasi model pembelajaran direct instruction untuk meningkatkan kemampuan berpikir kreatif mahasiswa. *PROMOSI (Jurnal Pendidikan Ekonomi)*, 5(1).
- Rattatumma, T., & Puncreobutr, V. (2016). Assessing the effectiveness of STAD model and problem based learning in mathematics learning achievement and problem-solving ability. *Journal of Education and Practice*, 7(12), 194–199.
- Rivera, N. (2013). *Cooperative learning in a community college setting: Developmental coursework in Mathematics*. [Arizona State University]. ProQuest Dissertation Publishing.
- Savery, J. R. (2015). Overview of problem-based learning: Definitions and distinctions. *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows*, 9(2), 5–15.
- Sivertsen, B. (2021). *Students' Health and Wellbeing Study 2021*. SiO. <https://sioshotstorage.blob.core.windows.net/shot2018/SHOT2021.pdf>.
- Suana, W., Maharta, N., Nyeneng, I. D., & Wahyuni, S. (2017). Design and implementation of schoology-based blended learning media for basic physics I course. *Jurnal Pendidikan IPA Indonesia*, 6(1).
- Suebnuarn, S., & Haddawy, P. (2006). A Bayesian approach to generating tutorial hints in a collaborative medical problem-based learning system. *Artificial intelligence in Medicine*, 38(1), 5–24.
- Sugiyono, P. D. (2019). *Metode Penelitian Pendidikan (Kuantitatif, Kualitatif, Kombinasi, R&d dan Penelitian Pendidikan)*. Metode Penelitian Pendidikan, 67.
- Suryabrata, S. (2014). *Psikologi pendidikan*. Jakarta: PT. Raja Grafindo Persada
- Wilton, M., Gonzalez-Nino, E., McPartlan, P., Terner, Z., Christoffersen, R. E., & Rothman, J. H. (2019). Improving academic performance, belonging, and retention through increasing structure of an introductory biology course. *CBE Life Sciences Education*, 18(4), ar53. <https://doi.org/10.1187/cbe.18-08-0155>
- Yapici, I. U. (2016). Effectiveness of blended cooperative learning environment in biology teaching: Classroom community sense, academic achievement and satisfaction. *Journal of Education and Training Studies*, 4(4), 269–280.
- Zhang Y, Zhou L, Liu X, Liu L, Wu Y, Zhao Z, et al. (2015). The Effectiveness of the Problem-Based Learning Teaching Model for Use in Introductory Chinese Undergraduate Medical Courses: A Systematic Review and Meta-Analysis. *PLoS ONE* 10(3): e0120884. <https://doi.org/10.1371/journal.pone.0120884>