THE EFFECT OF PROBLEM-BASED LEARNING (PBL) AND STUDENT TEAM ACHIEVEMENT DIVISIONS (STAD) MODELS WITH MASS MEDIA USE ON ECONOMICS LEARNING OUTCOME

Amin Fadly Kudadiri, Soetarno Joyoatmojo, Tri Murwaningsih
Sebelas Maret University, Surakarta, Indonesia

ABSTRACT

PBL and STAD models as active learning support the constructivist principle in the learning process. This paper aims to find out the difference effects of PBL and STAD models with mass media use on the Economics learning outcome. This study was a quantitative approach with experimental method. The population of research was Senior High Schools in Surakarta City in the school year of 2018/2019. This research employed hypothesis test to find out the difference effects in PBL model group with mass media use and in STAD model group with mass media use. This research included two analytical prerequisite analyses before conducting hypothesis testing: normality and homogeneity tests. The result of hypothesis testing showed the significant different of learning outcome between PBL and STAD models with mass media use in cognitive domains. Learning outcome of cognitive domain in PBL model with mass media use is better compared with STAD model group with mass media use. The result of hypothesis testing in psychomotor and affective domains did not show significant difference between the two model groups.

KEYWORDS: PBL, STAD, Mass Media, Learning outcome

INTRODUCTION

The presence of 2013 curriculum as Indonesia's national curriculum is the reinforcement of learning paradigm shift in constructivist principle. The learning still dominated by behavioristic theory with teacher-centered pattern is required to be reformed into the one with constructivist theory and student-centered pattern.

One of stringent critiques on the teacher-centered learning process relates to the rigidity in the learning process at school. Students seem to be a wooden doll chiseled corresponding to the educator's desire. Science obtained is limited to the transfer of knowledge from educator to students and thereby cannot facilitate the students' development comprehensively. The process will indirectly change the role of students from being the subject of learning into being the object of learning.

Panjaitan (2014) found the gap between curriculum document and active learning implementation in Senior High School (SMAs) in Indonesia in which the learning process is still dominated with conventional pattern. It confirms that the active learning shifting process started with the 1984 Curriculum called Cara Belajar Siswa Aktif (CBSA) that had not been realized in the field.

Learning process becomes a main determinant of the outcome to be achieved. Data of Computer Based National Exam (UNBK) result from Education Organizing Center of the Ministry of Education and Culture in Economics subject SMAs in Surakarta in the school year of 2017/2018 shows less satisfactory result, with mean score of 63.20. The data release shows that 21% of SMAs in Surakarta got outcome with good criterion, 58% did so with moderate criterion, and 21% had not met yet the successfully passing criterion of UNBK in 2018. The result indicates that Economics learning process has not been implemented well and effectively.

Tabel 1. Data of Computer Based National Exam Economics Subject SMAs in Surakarta in the school year of 2017/2018

No	Rating Scale	Quantities	Pecentage
1	Very Good ($85 < N \leq 100$)	0	0%
2	Good ($70 < N \leq 85$)	6	21%
3	Fair ($55 < N \leq 70$)	16	58%
4	Poor ($0 < N \leq 55$)	6	21%
	Total	28	100%

Source: Puspendik Kemdikbud RI 2018

Economics is one of compulsory subjects in Senior High school. This subject have been affected by learning process rigidity problem. Economics learning with various theories being its material tends to lead the learning process to conventional pattern as to positioning educators to be the main learning source, learning approach referring to textual and theoretical approaches only, and learning assessment focusing on cognitive improvement. As a result, students develop poorly and tend to participate passively in the learning process.

Kitaoka (2013) in his study on Economics learning found that many students could not take problem solving into account and connect it to methodology and theory taught. Students found difficulty in applying methodology and theory to the actual Economic problem. The objective of Economics learning at Senior High School level is to develop logical, rational, and critical reasoning on economic situation and problems in life. Therefore, a reform should be made on the Economics learning process, particularly by means of designing an active and creative learning process helping the students develop their competency.

Constructivist principle focuses on the student-centered learning in order to maximize potency and to develop its competency (Schunk, 2012; Eggen & Kauchak, 2010; Santrock, 2008). Scientific approach in the 2013 curriculum also builds on such principle in which the learning is emphasized on the reinforcement of process so that students attempt to construct their knowledge as maximally as possible.

PBL model learning builds on Dewey's constructivist thinking and learning theory in education. PBL supports fully the student-centered pattern in which the learning is developed through students' knowledge construction in experiencing and solving many life problems (Carriger, 2015; Arends, 2013; Savery, 2006). To facilitate the development of students' potency, PBL focuses on several components of learning: question or triggering problem, interdisciplinary focus, authentic investigation, artifact or display object production, and collaboration (Arends, 2013). PBL can encourage students to think of many things such as truth finding, thinking openness, analyzing ability, systematical thinking, strong curiosity, and thinking maturity (Hong and Yu, 2017; Loyens, Jones, and Van Gog, 2015; Oganisjana and Laizans, 2015).

STAD model builds on cooperative learning. Dewey in its democratic class concept emphasizes on students' small-size group learning solving problem in finding their own answer and studying democratic principles through daily interaction between one and another (Arends, 2013). Students tend to learn socially, comfortably, and joyfully, to work in group and to prefer giving information to their peer (Omar, Mohamad, and Paimin, 2015; Jafiliar, 2010; Brookhart and Durkin, 2003).
Some components of STAD model-learning create cooperative and democratic class: class presentation, team, quiz, individual advance score, and team recognition (Slavin, 2005). Three main goal of the development of cooperative learning model are academic outcome, tolerance, and acceptance to diversity and social skill development (Arends, 2013). STAD helps the students learn in democratic environment, cooperation and positive independency, and implementing their own role to achieve the group's success (Yusuf, Natsir and Hanum, 2015).

The learning refers to any attempt to stimulate the learning through organizing precise experience to help students achieve the change of ability wanted (Smaldino, Lowther, and Russell, 2009). To support a creative and innovative learning process, PBL and STAD learning models can utilize technology and information as learning media and source. Educators should be able to direct the students to treat and to utilize technology and information development today for something positive in order to minimize its negative potency.

The use of mass media like television, newspaper, magazine, and internet when it is managed thoroughly, can be learning media and source in Economics learning attracting the students' interest. Bahmani (2015: 198) found students more motivated to develop and to participate directly in processing analyzing the materials relevant to the real life interest in the Economics Learning. The use of mass media in Economics learning can be managed in the form of learning video, clipping, journal, scientific work, and others.

MATERIALS AND METHODS
This study tried to find out the effect of independent variable (X), namely learning model, on dependent variable (Y) namely learning outcome. It described this research that is causal in nature, targeting the quantitative approach. The treatment applied in this study was the application of

learning model leading this research to an experimental research method. This research employed a quasi-experimental design with control group but not functioning to control external variables affecting the learning outcome variable. The sample of experiment class used PBL model with mass media, while that of control class used STAD with mass media.

The population of research was Senior High Schools in Surakarta City in the school year of 2018/2019. The sampling technique used in this study was cluster random sampling. The sample was selected from the sub population of Senior High School with accreditation A and using the 2013 curriculum. SMA Muhammadiyah 2 Surakarta was selected to be the class treated with PBL model and mass media, SMA Negeri 8 Surakarta to be the class treated with STAD model and mass media use, and SMA Negeri 6 Surakarta to be instrument trial class. One class was selected from each of schools to be the sample.

Techniques of collecting data used in this research were test, observation, and documentation. The test used in this research was cognitive domain test. Instrument test was conducted to find out whether or not it is qualified to be an instrument of collected data. The tests conducted were validity, reliability, difficulty, and variance tests. Observation was conducted to observe students' ability, attitude, and behavior in learning process particularly in the assessment of psychomotor and affective domains. Documentation is needed to collect information in the form of students' previous learning outcome that can be analyzed to describe the students' condition and ability.

Techniques of analyzing data used in this research were analytical prerequisite and hypothesis tests. The test was conducted using a one-way variance analysis with IBS SPSS 22 application help. Analytical prerequisite test included normality test used to find out whether or not the data taken derived from normally distributed population, and homogeneity test to find out whether or not the variances of a number of populations are equal. Furthermore, hypothesis testing was conducted to find out the different effect of PBL and STAD with mass media use on Economics learning outcome.

RESULT AND DISCUSSION
A. Learning Outcome in Cognitive Domain
Data of learning outcome for cognitive domain is obtained from the students' learning outcome test. Before conducting hypothesis testing, this result has undertaken normality and homogeneity test. Then, hypothesis testing was conducted using a one-way variance analysis.

Table 2. One Way Anava Test in Cognitive Domain

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	285,454	1	285,454	10,480	,002

The result of hypothesis testing on the learning outcome in cognitive domain shows that significance level of PBL and STAD model groups is 0.002 wit F value of 10.840. Considering the decision making in hypothesis testing, p value (sig.) 0.05 means H0¬ is not supported, and H¬¬1 is supported at significance level (α) of 0.05. It indicates that there is a significant difference of learning outcome in cognitive domain between PBL and STAD model groups with mass media use.

The mean score of learning outcome in cognitive domain is 84.34 for PBL and 78.4 for STAD model groups. Generally, it can be concluded that PBL model with mass media use affects the learning outcome of cognitive domain better than the STAD model with mass media use does.

The application of PBL model can improve learning outcome in cognitive domain, as indicated with the increase in the mean posttest score compared with the mean score of previous pretest result. PBL supports fully the learning active, thereby preparing the students for being independent learners. Through the real learning, PBL utilizes the effect of students' participation and autonomy on their learning motivation. The students will be encouraged to contribute actually to constructing their knowledge. Such contribution practices the students' decision making ability corresponding to their thinking and understanding. Such learning model can make the learning effective and strengthen the students' long term memory (Yew and Goh, 2017). The memory is very helpful to students in the learning process, particularly in answering the learning test.

Subagia and Tika (2014) also found that PBL-model learning affected significantly the learning outcome of cognitive domain, particularly in the aspects of applying, analyzing, evaluating, and creating. PBL learning model develops thinking skill, solves problem, and encourages the students to be independent learners. PBL model learning accustoms students with metacognitive conceptual and conceptual thinking to develop their knowledge on the problems encountered (Stepien and Gallagher, 1993; Loyens, Jones, Mikkers and Van Gog, 2015).

PBL model has several components to construct learning process: problem/question, interdisciplinary focus, authentic investigation, artifact production, and collaboration. PBL learning empowers the students to conduct a research, to integrate theory into practice, and to apply knowledge and skill, and to develop students' thinking skill in order to find feasible solution in defining the problem. The application of PBL model enables the students to obtain cognitive scheme that can guide the students in solving problem (Jalani and Sern, 2015).

The mean score of learning outcome in cognitive domain for STAD model group with mass media use was 78.4. This score is lower than that for PBL model group with mass media. However, the result shows an increase from the score of previous pretest. It indicates that STAD model can improve the students' learning outcome in cognitive domain as well (Muryanti, 2009; Rattanatumma and Puncreobutr, 2016).

One of constraints found with this application of STAD model relates to establishing an effective communication between students. The characteristic of STAD learning model is cooperative, focusing on the cooperation between students with heterogeneous grouping, based on different ability, sex, and background (Slavin, 2005). The group with heterogeneous members indeed gives varying learning experiences but takes a sufficiently long time to build team with good cooperation and mutual understanding.

Students with higher academic ability assume higher responsibility to direct other group members. It can be seen from their role more dominant and prominent in group activity. Dewi (2014) also found that in the application of STAD model, the students with lower academic ability tend to be passive in group discussion activity. This different role affects the development of students' ability of constructing their knowledge individually. The maximum score of cognitive domain achieved by students in PBL and STAD model groups is the same, 92. However, the minimum score of STAD model group is slightly lower with the higher proportion in the lowest score range compared with PBL model group's, thereby affecting the mean score.

Therefore, to maximize cooperative principle of STAD model gradually, educators establish team/group first with effective communication and interaction pattern. Piaget argued that all children experience the same development order with different speed (Slavin, 2008). Cooperative principle will very helpful to students to develop through cooperating and exchanging idea with their peers.

B. Learning Outcome in Psychomotor Domain

Data of learning outcome for cognitive domain is obtained from the students' performance and task. This result has undertaken by normality and homogeneity test. Hypothesis testing was conducted using a one-way variance analysis.

Table 3. One Way Anava Test in Psycomotor Domain

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	38,599	1	38,599	1,801	,187

The result of a one-way variance analysis on the learning outcome of psychomotor domain shows that significance value of the two models is 0.187 with F value of 1.081. It indicates that there is no significant difference of learning outcome between PBL and STAD learning model groups with mass media use for psychomotor domain.

The application of PBL model with mass media use can improve the students' learning outcome of psychomotor domain, as indicated with the increase in the mean score of posttest compared with that of previous pretest. PBL model leads the students to be responsible for their own knowledge development through individual and group research.

It also accustoms the students with problem/question, investigation and finding solution to prepare them for dealing with learning tasks. This PBL learning with mass media use encourages the students to learn novelties through social and intellectual problem investigation in their environment. Utilizing learning media and source material searched for and managed independently will grow motivation and active participation in the learning process. This learning will grow positive attitude and satisfaction in expressing the learning experience (Oganisjana and Laizans, 2015; Tan, Van Der Molen and Schmidt, 2016). Positive attitude and motivation can underlie the students' interest in and self-consciousness of learning and developing.

Hmelo and Lin (in Hmelo and Barrows, 2006) revealed that their empirical study on PBL learning has shown that students can apply knowledge better to new problems and utilize self-directed more effectively. Students need self-directed ability to develop their competency, particularly their skill, independently. It is this skill that helps students work on task, demonstration, and undertake their learning outcome test.

STAD model with mass media use can also improves the students' learning outcome of psychomotor domain as indicated with the increase in the mean score of posttest compared with that of pretest. STAD cooperative model learning is the simplest cooperative model in which the student group learning includes some stages: discussing the problems encountered, comparing the answer, or correcting misconception together. Through such cooperation and collaboration pattern, the students can develop their mindset helping them understand the material and work on the learning tasks.

Heterogeneous group in STAD model facilitates the students to learn with each other, to understand the broader problem from varying point of views, thereby enabling them to decide on the feasible solution to the problem encountered. Learning more deeply from the material can be done through explanation, idea exchange, elaboration or mental process in which there is a variety of active interactions either between fellow members or between groups (Jafiliar, 2010). Through this, every member will be encouraged to learn to understand and to prepare themselves for answering the quiz and for working on other individual tasks. The application of STAD cooperative model encourages the skill development in students' learning process and psychology (Dewi, 2014; Keramati, 2014).

C. Learning Outcome of Affective Domain

Data of learning outcome for affective domain is obtained from the result of observation on students' attitude during the learning process. The attitude is viewed from five aspects: discipline, responsibility, mutual respect, self-confidence, and curiosity. The learning outcome of affective domain does not show significant difference between PBL and STAD learning model groups with mass media use. The mean score of these two groups belong to B (Good) predicate.

PBL with mass media use encourages the students to learn novelties through authentic investigation on economic issues in their environment. There are two aspects of attitude that stand out in this

group of models compare to the STAD models group: self-confidence with B predicate and curiosity with B+ predicate. This learning will grow interest in expressing the students' learning experience, there by growing their curiosity in the learning process. Students' participation in searching for and managing information as learning material and media will help construct the knowledge. In addition, it will grow students' self-confidence and responsibility for the learning process they undergo.

STAD with mass media use tries to create a cooperative and democratic circumstance in the learning process. The aspects of mutual respect grow in this learning with B+ predicate. One main goal of cooperative learning is tolerance and acceptance to diversity. Cooperative learning gives the students an opportunity of interacting with others having varying background and conditions to cooperate with each other in the same task, there by learning to appreciate or to respect each other (Arends, 2013). This learning also cultivates good responsibility either individually or in group.

CONCLUSION

Based on the results and discussion of the study shows that that there is a significant difference of learning outcome in cognitive domain between PBL and STAD model groups with mass media use. The mean score of learning outcome in cognitive domain also shows the difference in influence of the two groups of models where PBL model groups with mass media use better than the STAD model groups with mass media use. PBL model leads the students to be responsible for their own knowledge development for being independent learners.

Learning outcomes of students' psychomotor domains showed no significant difference between the PBL model groups with mass media use and the STAD model groups with mass media. Both groups of models have a positive influence on learning outcomes of students' psychomotor domains. PBL create satisfaction in expressing the learning experience and self-directed ability to develop their competency and particularly their skill independently. STAD create a cooperative learning to facilitates the students to learn and help with each other.

Affective domain learning outcomes also showed no significant difference between the PBL model groups with mass media use and the STAD model groups mass media us. Both groups influence different aspects of attitude according to the characteristics of the model. PBL will grow curiosity and self-confidence in the learning process through students' participation and autonomy in authentic investigation. STAD develop mutual respect attitude in classroom tolerance and acceptance to diversity.

REFERENCES

Arends, R. I. (2013) Learning to Teach (9th ed.) New York: McGraw-Hill Companies, Inc.

Bahmani, S. (2015) Improved Critical Thinking in Students Using Current Events Journaling. International Journal of Sociology and Social Policy. 36 (3). 190-202.

Brookhart, S. M., Durkin, D.T. (2003) Classroom Assessment, Student Motivation, and Achievement in High School Studies Classes. Applied Measurement in Education. 16 (1). 27-54.

Carriger, M. S. (2015) Problem-Based Learning and Management Development Empirical and Theoretical Considerations. Journal of Management Education. 13. 249-259.

Dewi, K. D. (2014) Studi Komparatif Model Pembelajaran Kooperatif Tipe TAI (Team Assisted Individualization) dan STAD (Student Team Achievement Division) Terhadap Hasil Belajar pada Mata Kuliah Akuntansi di Universitas Islam Negeri (UIN) Malang. Jurnal Pendidikan Ilmu Pengetahuan Sosial. 1 (1). 1-20.

Eggen, P., & Kauchak, D. (2012). Strategies and Models for Teachers Teaching Content and Thinking Skills (6th ed.). Boston: Pearson.

Hmelo, C. E., & Barrows, H. S. (2006). Goals and Strategies of a Problem-Based Learning.Facilitator. Interdisciplinary Journal of Problem-Based Learning. 1 (1). 21-39.

Hung, S. & Yu Ping (2017) Comparison of the Effectiveness of Two Styles of Case-Based Learning Implemented in Lectures for Developing Nursing Students' Critical Thinking Ability: A Randomized Controlled Trial. International Journal of Nursing Studies. 68. 16-24.

Jalani, N. H. & Sern, L. C. (2015) Efficiency Comparisons between Example-Problem-Based Learning and Teacher-Centered Learning in the Teaching of Circuit Theory. Social and Behavioral Sciences. 204. 153 – 163.

Jalilifar, A. (2010) The effect of Cooperative Learning Techniques on College Students' Reading Comprehension. System. 38. 96-108.

Keramati, M. R. (2014). Effect of Student Team Achievement Division (STAD) on Academic Achievement of Undergraduate Psychology Students. International Journal of Education and Applied Sciences. 1 (1). 37-47.

Kitaoka, H. (2013) Teaching Methods that Help Economics Students to be Effective Problem Solvers. International Journal of Arts and Commerce. 2 (1). 101-110.

Loyens, S. M.M., Jones, S. H., Mikkers, J., & Van Gog, T. (2015) Problem-Based Learning as a Facilitator of Conceptual Change. Learning and Instruction. 38. 34-42.

Muryanti, E. E. (2009). Pembelajaran Kooperatif Tipe STAD Sebagai Upaya Peningkatan Hasil Belajar Ekonomi Pokok Bahasan Ketenagakerjaan pada Siswa Kelas VIII MTS Manba'ul A'la Purwodadi Tahun Pelajaran 2008/2009 (Tesis). Semarang (ID): Universitas Negeri Semarang.

Oganisjana, K. & Laizans, T. (2015) Opportunity-Oriented Problem-Based Learning for Enhancing Entrepreneurship of University Students. Social and Behavioral Sciences. 213. 135-141.

Omar, N., Mohamad, M. M., Paimin, A. N. (2015) Dimension of Learning and Student`s Academic Achievement. Social and Behavioral Sciences. 204. 172-182.

Panjaitan, M. O., (2014) Implementasi Pendekatan Belajar Aktif di Sekolah Menengah Atas. Jurnal Pendidikan dan Kebudayaan. 20 (1). 44-58.

Rattanatumma, T. & V. Puncreobutr (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.

Slavin, R.E. (2005) Cooperative Learning. Boston: Ally dan Bacon.

Slavin, R. E. (2006) Educational Psychology: Theory and Practice (8th ed.). Boston: Pearson Education, Inc.

Stepien, W. & Gallagher, S. (1993). Problem-Based Learning: As Authentic as it Gets. Educational Leadership. 50 (7). 25-28.

Subagia, W. & Tika, N. (2014) Studi Komparasi Penggunaan Model Pembelajaran Problem Based Learning (PBL) Dan Kooperatif Tipe Group Investigation (GI) Terhadap Hasil Belajar Berdasarkan Taksonomi Bloom. Jurnal Pendidikan dan Pembelajaran IPA Indonesia. 4 (1). 1-9

Santrock, W. J. (2008) Educational Psychology (5th ed.). New York: McGraw-Hill Companies, Inc.

Savery, J. R. (2006). Overview of Problem Based Learning: Definitions and Distinctions. Interdisciplinary Journal of Problem-based Learning. 1(1). 9-20.

Smaldino, E. S., Lowther, L. D., & Russell, J. D. (2009) Instructional Technology and Media for Learning. Boston: Pearson Education.

Tan, C.P., Van der Molen, H. T., & Schmidt, H. G. (2016) To What Extent Does Problem-Based Learning Contribute to Students' Professional Identity Development?. Teaching and Teacher Education. 54. 54-64.

Yusuf, Y. Q., Natsir, Y. & Hanum, L. (2015) A Teacher's Experience in Teaching with Student Teams-Achievement Division (STAD) Technique. International Journal of Instruction. 8 (2). 99-111.