

# Group-work Evaluation Strategy to Reduce Free-rider Behavior on Project-based Learning

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**Abstract:** Learning in higher education requires a dynamics of learning which able to grow up the critical thinking, analyzing, communication, negotiating, cooperation, and argumentation. The term to describe those personal attributes that indicate the various ability is a soft skill. Definitely the all sort of ability is about to build through project-based learning. In general, project-based learning implemented by using group work. Interestingly, previous study indicate the implementation of group work in higher education has been accompanied by free riders or social loafing in a group work. Even though, the evaluation practice provides an opportunity to control that problem. This study aims to: 1) developing evaluation design to controlling the free rider's behavior on project-based learning; and 2) developing evaluation design which improves group work learning satisfaction. This study conducting to Borg and Gall research and development design and Plomp and Nieveen involves: analysis, design and develop prototype and evaluation. The population in this study are the students of Departement of Accounting Education, Faculty of Economy in the Universitas Negeri Medan (UNIMED). Meanwhile, the purposive sampling technique is used to selecting the students who engaged in Learning Evaluation subject. The instrument of evaluation which developed has been validated by judgment expert and received a positive response from students. Student response of satisfaction, which collected by questionnaire, shows that student satisfaction were high by evaluation learning design that tested to them. The design highly potential to be tested and adopted in another subject.

## 1 INTRODUCTION

Basically, individual and group learning have an essential value for students to develop their comprehensive thinking. Individual learning provides a freedom for students to encourage their profundity and autonomous in action, meanwhile, a group working allow them to deliver activities which cover the process of sharing knowledge, soft skill, and creativities in its turn will produce effective individual performance, group, and organization (Dalkir, 2013; Dyball, Reid, Ross, & Schoch, 2007; Maiden & Perry, 2011).

Furthermore, project-based learning (PBL) put special interest in higher level education. The implementation of PBL usually using group work which is focused on the quality of professional worker, including the accountant and a teacher which strive for own the abilities of communication, cooperation, collaboration, and good compromise (Maiden dan Perry, 2011). So, it can be concluded as a person who wants to be a professional accountant

or professional teacher, they must have an accounting cognitive ability and soft skill to apply their knowledge (Herawati, 2012). In other words, the student needs an activity to produce their experience in order to develop their hard skill and soft skill. This is the core of group working learning, in the previous section learning activities emphasize to technical knowledge in traditional or conventional learning activities that has been shifted into the process on provide a place for student to develop themselves about theory, principle, and concept which support accounting and business practice (Flood dan Wilson, 2008) and so in teaching. Science and practical knowledge gained from group work learning through sharing knowledge activities, interaction amongst the group member, brainstorming, sinters analysis, and teamwork on one project.

The previous study has been observed group work in developing skills to transferred by means of the dynamics on group work, self-management, planning process and organizing in the accounting

students environment (Dyball, Reid, Ross, Schoch., 2007). Then they testing a group work that formed informally in the classroom. Meanwhile, Maiden and Perry (2011) stated that group work is an essential part of effective student integration to developing interpersonal skills and learning. And so, Maiden and Perry (2011) leads a mandatory and intend to facilitate by educators.

A group work encourages individual to learn by the culture process of participating in the teamwork with the sequential process and submissively do an interaction on social norm (Lave and Wenger, 1991). But basically, group work has its own dilemma. It shows by some of academician evaluating group work activities causes a trouble by the process. Trouble, in this case, means appear from forming a group at the beginning, for instance, a group work made by teacher instruction or student make their own group without teacher instruction. At that time choosing the group member might be affecting a homogeneous in their knowledge capacity, while in the process of brainstorm each group member needs some heterogeneous character. It is different from Rust (2001), he states that when the group member chosen by teacher some students feels inconvenient then they unwilling to participate each other. Meanwhile, in other words, the terms usually called as free-rider.

This happens because when the group's performance is well-regarded by the teaching staff then the good value also be obtained by members of the group who are not involved. So the free riders get the benefits even though he does not participate in the group and of course the situation is detrimental to other group members. In the educational point of view, this problem should be taken seriously. Because such circumstances can disrupt character building, such as responsibility, initiative, participatory, mutual ownership, and cooperative, in a free rider. While the other group members will be disturbed in the attitude of indifference and concern for others. Therefore this study aims to develop a learning evaluation instrument that is able to stimulate students to remain active in the group. The design of the evaluation instrument is done so that the free rider in project-based learning is possible to reduced.

## 2 THEORETICAL FRAMEWORK

### **The Dynamics of PBL and Group Work**

PBL is generally organized with various complex activities during the learning process (Grimm and Blazovich, 2016). These activities include classroom learning, project implementation, development of

draft papers, peer reviews, and paper improvements (Grimm and Blazovich, 2016). In more detail, Baron et al. (1998) offers a series of procedures in the implementation of PBL. First, Collaboration Design: Students are divided into several groups. Then students are given the topic of current issues that are appropriate to the learning objectives. This topic will stimulate student curiosity. Second, Ranking: After the project is implemented, then it is assessed by the lecturer. Assessment is useful to confirm the suitability of the understanding possessed by students with learning objectives. Third, Revised: In the last case, students are asked to make improvements to aspects that are not true. In this process, the lecturers provide guidance so that students know the strategies to implement the project correctly and can achieve the learning objectives. Finally, Presentation: After going through a series of improvements, students must submit project achievements that are being carried out in front of the class. The results of this project should be an indicator of the completion of learning objectives.

To implementing the complex procedure of PBL, lecturer is usually using group work among the students. Therefore, every member of the group is mandatory to engage in the entire project. The situation is inline from the activities that occur in the real work activity. In the business sector as well as the public sector working groups are still used to improve the performance of individuals and sustainable organizations. From the standpoint of knowledge management, the working group is called the Community of Practice. The Community of Practice (CoP) is a group of individuals (practitioners) who share the same interests and take the place to share, participate and build friendships (Dalkir, 2005). Thus in CoP is expected to occur knowledge sharing process related to their work, problems, and obstacles that they experienced, which led to problem-solving. Solving the problem will be the creation of new knowledge to overcome practical problems in work so that will contribute to innovation, both process and product (Nonaka dan Taekuchi, 1995; Dalkir, 2005). Dalkir (2005) explains initially this concept is standing informally, but gradually the company's management realizes that this concept can contribute to the company to achieve competitive advantage. Along with its development, some companies keep this community in non-formal conditions, and some companies are beginning to formalize it. Likewise, although in a non-formal state, the company still facilitates and provides the container to the CoP. In the context of teaching and learning activities, the concept can be absorbed to support student academic performance. The concept can give students the opportunity to

develop their practical and conceptual understanding that is supported by the principles and theories that have been conveyed in the classroom. CoP among students can stimulate the exchange of knowledge and innovation in learning among students.

In another side, On the other hand, to ensure students gain experience working in teams or groups, group-based learning should be designed to be a liability in certain learning processes. It is necessary not only to build habits and expertise in teamwork, but also to be important in solving cases and getting an understanding of the case, project assignments, synthesis analysis, observation, mini research, and other activities. In a mandatory group learning situation, this problem arises. The emergence of problems ranging from the composition of group members, group performance, to group members' dissatisfaction with the group. The root of the problem lies in the presence of passengers or free riders in group members.

### **Free Rider and Evaluation Design**

Free riders are those who do not participate or participate at least in the group but get maximum benefit from other group members through good group assessment results. Free riders can be aligned with social loafing, defined by Maiden and Perry (2011) as gradations along the continuum, representing lost productivity and hampering success and smooth work, thereby reducing the benefits of teamwork. The working group often raises the perception of lack of justice and transparency among students, and amongst teachers, it is equally caused to frustrate (Maiden and Perry, 2011). Group work often consumes energy and time with unproductive meetings and discussions because of the presence of members who are indolently (Kaye, Kayes, and Kolb, 2005).

In certain circumstances, problems also occur when in the same group and different courses students divide responsibilities based on courses and take roles according to their own ability in certain courses. Social loafing also occurs on the economically motivated aspect, at a given moment there are group members who feel they can contribute financially so that they can reduce the participation of the group's work (Albanese and Van Fleet, 1985), but those who are not involved in the extreme group and not financially involved (Gachter and Thoni, 2004)

Basically social loafing is the tendency of group members to act down from their actual abilities if the work has to be done on their own then it will be able to do it well (Brooks and Ammons, 2003; Chidambaram and Tung, 2005; Karau and Williams, 1993; Kravitz and Martin, 1986). Hence the issue of justice emerged. Because free riders or social loafing

explain the situation where the individual is actually capable, it's just that he took an unfair part in the workload of the group compared with other group members.

Therefore, the assessment within the working group often leads to contradictions. The individual performance in the group is tied to his group's overall performance so that he is forced to accept group assessment as a result of his work (Scotland, 2016). This situation allows the student to get numbers that are not in accordance with the knowledge or skills that he actually has. The incompatibility can be higher or lower. Some researchers have found that individual judgments do not represent group judgments, so they conclude that assessment should still be done on individuals, not on group performance (Bourner, Hughes, and Bourner, 2001; Gammie and Matson, 2007; Knight, 2004; Plastow, Spiliotopoulou, and Prior, 2010).

In this case, the student has the right to question what assessment approach the lecturer uses to evaluate group performance. And some studies indicate that students are not satisfied with the group's performance results obtained (Burdett, 2003; Li and Campbell, 2008). The discontent arises from the gap between the ability he has with the group performance he gets and if the result has been matched by the expectations of the students disturbed because of the passive group members but gets good judgment based on group performance, so that view leads to the perception of injustice (Livingstone and Lynch 2000; Gammie and Matson, 2007; Li and Campbell, 2008)

Previous studies have offered and tested several methods for reducing free riders in group tasks, including:

1. Group evaluation: Brooks and Ammons (2003) have offered and tested a group evaluation model with peer evaluation design among group members. The evaluation was performed with the initial implementation instrument, multipoint evaluation, and the use of the evaluative specific criteria. The results of the Brooks and Ammons (2003) study indicate that these instruments successfully mitigate the free rider action within the group's stake in the cross-disciplinary business class. While Maiden and Perry (2011) also develop evaluation designs similar to instruments that allow each member of the group to mark the performance of each group member and can also be scored. Furthermore, from the existing evaluation indicators, each group member can do a split based on the results of his evaluation of his group's peers (Rust, 2001). friction in the questionnaire. Maiden and Perry (2011) adapted these instruments from Brooks and Ammons

- (2003), Rust (2001), and Strong and Anderson (1998).
2. Viva warning and two card stick. Both models were adapted by Maiden and Perry (2011) from Abernethy and Lett, (2005); Lejk (1994); Leijk, Wyvill, and Farrow (1996); and Rust (2001). Viva warning and two card stick have the same principle. In the process of group work internally team members verbally warned by team members who are inactive, they can give a specific challenge to improve the performance of the group. If it does not work then the second warning will be done by the tutor and the tutor can give a warning or yellow sticks to mark the status of passive group members and write down the due date of improvement to be done. If the improvement is not met then the tutor can provide a red mark on a card or stick that indicates a person is leaving the group member and must personally take responsibility for his or her duties.
  3. Team-led Individual (Rust, 2001; Maiden and Perry, 2011). In this group's work model the lecturers provide group work projects to the students, only the results of group work collected are not graded. Each individual still has to do follow-up work based on group work and collected as a result of individual work.
  4. Examination follow-on adapted Maiden and Perry (2011) from Gibbs, Habeshaw, and Habeshaw (1993); and Rust 2001. This model is slightly different from individual team-leads. In this model, the work of the group is still required to be collected and assessed. It's just that the assessment does not stop at the work of the group. But at the time of the class test, testing is done based on the project, this is to identify the depth of knowledge and reference wealth that the group members have of the project tasks that have been done.

In this study, the design of group evaluation was adapted from the study of Brooks and Ammons (2003) and Maiden and Perry (2011). Likewise, adjustments should be made to the instances of these studies to fit the characteristics of students in Indonesia and improve the efficiency of the evaluation. Referring to Maiden and Perry (2011) the instrument will be extracted and designed in the form of a diary. In this study, the evaluation model that will be adapted is group evaluation, viva warning, and examination follow-on. If Maiden and Perry (2011) tested the five models applied to different classes, the three models will be combined and extracted into one evaluation instrument tested in one group, although it can consist of several classes. And will be compared to its performance with the control class with the assessment based on

the results of group work alone. Instruments that have been built will be published in the network (electronic). So that students will easily fill the instrument through the phone or his computer. Instrument design that allows translated into a scale of numbers will be more easily analyzed with the help of computers so that decision-making can be done more efficiently. This is important because in viva warning conducted in this study was not publicly announced in class. Teachers maintain the confidentiality of the assessment to maintain the privacy of the students, only the additional assignment is given based on that assessment.

The study was designed not only to reduce free-riders and improve user satisfaction in group learning activities. But more than that, this study seeks to maximize the process of sharing knowledge in groups so that knowledge gaps within the classroom can be narrowed down. Satisfaction in classroom learning and free-rider reduced perception in terms of questionnaires to be given to students before and after group learning activities. While the mapping of knowledge can be reviewed from the test results held by students, by reviewing the variance of exam results in groups and classes.

### 3 RESEARCH METHOD

This research is operated as development research. The intended development is the development of an evaluation instrument that embodies a group work evaluation design. The population of this study is taken from students who are in the third semester which oriented to the Indonesian National Qualification Framework (KKNI). Samples were taken by purposive sampling. The unit of analysis in this research is individual. The research will be conducted on the subject of learning evaluation because that in many of group work during the subject conducted in the classroom. The number of samples in the class is 76 students. Although the sample size is relatively small, referring to a conservative perspective, the results of the study can still be translated on a wider scale (generalization). For example, if under the conditions of the teaching-learning strategy and evaluation of the learning result is successful, it can also be implemented in other courses, because the essence of this research is not in the course, but the group learning dynamics in the learning activities.

#### Research Procedure

The development of evaluation instrument in this study is referring to the Borg and Gall (1984) and

Plomp and Nieveen (2013) development procedures but is limited only to the validation and testing stages. The result of the development of a final prototype that has been through a series of validation and testing stages is then implemented and evaluated for continuous improvement so that the built instrument has reliability in evaluating group learning. The activities carried out during the development process are:

1. Needs Analysis: Activity began with an analysis of the situation and problems that occur in group work in Accounting Education Study Program on the Faculty of Economy UNIMED. The results of the situational analysis are then examined theoretically based on theories and developed research.
2. Development: The results of the Needs Analysis are further used as the basis for the development of relevant evaluation instruments. Relevance in this context is the conformity of the problem with the theory used to construct evaluation design. Activity begins by designing an evaluation design taking into account the latest research findings and adapting the product from the research. The adaptation of the design from the previous development research was conducted in the hope that the adapted design already has good validity and reliability. Although in this study the instrument remains re-validated to ensure the validity of the instrument. The design of the evaluation design that has been determined for use is further constructed into an evaluation instrument for group work. Evaluation instruments that have been built subsequently realized in the learning tools of the Semester Lesson Plan (RPS) and Lecture Contract. Instruments that have been built at this stage are categorized as prototype 1.
3. Product Testing: Prototype 1 that has been produced at the realization stage, then tested its validity by 2 experts from UNIMED, North Sumatra. Based on the results of this validation test, then made a small revision to obtain the evaluation instrument in the form of prototype 2. After obtained this prototype 2, then conducted field testing. Field testing activity is divided into two aspects, namely 1) review legibility of students related to the instrument that has been built; and 2) review the level of student satisfaction with the evaluation instrument used. The results of these trials were used to evaluate the performance of the evaluation instruments and carried out further improvements.

## 4 RESULT AND DISCUSSIONS

Needs analysis in this study refers to the background of the problem to the theoretical studies described earlier. Based on these descriptions, then emerged evaluation design options that can be adapted to improve project-based learning performance, such as 1. Group Evaluation; 2. Viva Warning and Two-Card Stick; 3. Team-Led Individual; and 4. Examination Follow On. The four designs are then reviewed in relevance to the research problems and their compatibility with student characteristics in the Faculty of Economy UNIMED.

In the development stage, adaptation is made between the latest research findings with the characteristics of students and instruments that have been used by some lecturers in the Faculty of Economy UNIMED. Basically some lecturers in Accounting Education Study Program on Faculty of Economy UNIMED has used peer ranking systems in assessing group assignments. It's just that the assessment still has various weaknesses in determining the score value in accordance with the portion of student participation.

Therefore, in the group evaluation instrument, a scoring item was added which allowed the students not only to rank but also to score the performance of their group mates. Further developed instruments also adapt the concept of viva warning (Abernethy and Lett, 2005; Lejk, 1994; Lejk, Wyvill, and Farrow, 1996; and Rust, 2001) but with little modification. Instruments are built by allowing students to explain the dynamics within their group. Under certain circumstances, students will be reluctant to perform direct reprimand on members of the group. Because the instrument is privacy and confidential, students are expected to be free to tell the dynamics of his group honestly and reprimand against colleagues a group of inactive can be written on the instrument. Furthermore, the lecturer can take follow-up wisely based on the findings in the instrument.

Decision-making lecturers in the classroom may refer to one or a combination of Warning, Team-Led Individual (Rust, 2001; Maiden and Perry, 2011) and Examination Follow-On (Gibbs, Habeshaw, and Habeshaw 1993; Rust 2001) strategies, depending on dynamics in the classroom. In general, this evaluation instrument is built based on the instruments have Maiden and Perry (2011) with various modifications and adaptations in accordance with student characteristics and assessment instruments that have been available before. Based on various theoretical studies the evaluation

instrument developed in this study is considered to have fulfilled the validity of the content. However, to ensure its validity, construct validation is assessed by expert judgment on the evaluation instrument that has been successfully developed. The validity of the evaluation constructs was assessed by two experts in education evaluation from the Faculty of Education UNIMED. The process of validation by such experts resulted in some minor improvements to the evaluation instruments that have been developed.

Table 1: Satisfaction Response and Perception of Student Justice Related to Design of Group Work Evaluation

No	Variables	Min	Max	Avg	SD
Perception of Justice					
1.	Fairly to assess group performance	3	5	4,25	0,76
2.	Usefully for controlling the free-rider	3	5	4,20	0,71
Perception of Satisfaction					
3.	I am satisfied with this method of assessment	3	5	4,20	0,71
4.	This format of assessment agreed with my expectations	3	5	4.05	0,65

Furthermore, after passing the development stage, then enter the process of this research in the test phase. The practicality of a developed learning device, including the evaluation instrument, is based on the implementation of the tool in the learning execution. The value of practicality is obtained based on the results of field trials. Field trials were conducted in 2 aspects, namely: 1) readability of the instrument by the students, and 2) student satisfaction response related to the evaluation instrument used. Therefore, at this stage of the test is still open opportunities for improvement in the instrument that is easily understood by users (Lecturers and Students) and has a value of benefits on student learning satisfaction. From field trials obtained feedback and response satisfaction and justice owned by students. The response of learning and justness satisfaction was obtained through the instrument adapted from the learning satisfaction variable in this study collected using questionnaire instruments that were adapted from Maiden and Perry (2011) and Brooks and Ammons (2003).

Feedback obtained from students results in minor improvements to the statement-statement editions and questions within the instrument. While student satisfaction response indicates that students tend to feel satisfied with the instrument used. Besides, the

students also tend to feel the evaluation design that is used fairly in group learning so that it can reduce the free rider action in the group. The satisfaction and justice response can be reviewed in Table 1.

## 5 CONCLUSIONS

This research has produced several conclusions as follows:

1. This study has succeeded in developing a groupwork evaluation design that is able to produce learning satisfaction and perception of justice for students related to the potential of free riders in project-based learning.
2. The evaluation design developed in this research has fulfilled the criteria of validity, practicality, and effectiveness. Validity is gained through expert opinion, while practicality is obtained through trials to students, and effectiveness is gained through student satisfaction and student perception of justice responses,
3. The realization of project-based learning with the implementation of evaluation instruments that have been developed in this research seeks to control the risk of free rider present in doing the task or project of the group. The design of this evaluation also seeks the growth of scientific culture and cooperation among students in accordance with UNIMED's goals written in Vision and Mission (No. 4) UNIMED.

Relating to the conclusions, this study produces some of the recommendations as follow:

- 1 This research has a practical recommendation on updating evaluation design that has been used by lecturers in teaching and learning activities using the cooperative method. The update is done to control the risks that may arise from the application of the method, one of which is the presence of free riders.
- 2 For stakeholders, it can review evaluation designs that have been developed or re-validated, and further developed to be generally acceptable and standardized at both the faculty and university level. Despite its limitations, however, further development of this instrument has the potential for the presence of a generally acceptable evaluation design.
- 3 Further research probably to test empirically the implementation of the developed instrument. Further empirical testing is very important to obtain evidence of performance of the

instrument. Performance of the instrument can be reviewed based on student's learning satisfaction and academic performance obtained by students as a result of the use of the instrument. Other studies that combine specific learning methods with evaluation design are interesting to review further.

- 4 Limitations of this research are the homogeneity of the sample and the narrowness of the sample scope only in the Accounting Education Study Program and the limitations of empirical testing related to the causality of this instrument to the satisfaction of learning and academic performance. Development of the sample is not yet possible by vocational varieties and actual conditions that are running. It's just for the next research can develop a sample of the object across department and university. The level of confidence in a study can be improved by the use of experimental methods to test the relationship of causality empirically. Besides, the experimental research method can be an interesting option to improve the internal validity of a study.

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