Research on the Effect of Post-Group Discussion Assignments on Learners

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Abstract: Group discussion and group homework belonging to small-group learning are thought to be powerful asset in the toolbox of instructs. There are numbers of research study the design of homework assignments to improve students' group performance. However, research on tailor the assignments to students after a group discussion is limited. This study examines the students' achievement and their perceived learning after group discussion in two task situations: doing homework in group and in individual. The findings revealed that even after a group discussion in the class, a group assignment is also needed to improve students' learning performance and their perceived learning. In addition, there were differences in the effects of group work on students' performance in two types of homework, that is group assignment functioned more effectively in concept-oriented task than case-oriented task. The findings of this study have guiding and practical implications for educational practices to assign students' homework after discussion in the class.

1. Introduction

Group discussion and group assignments, which both belong to the umbrella of small-group learning or group collaboration, are thought to be powerful asset in the toolbox of instructors. They have the beneficial effects on students' cognitive processes through collaboratively or interactive behaviors like providing explanations or listening to others. Suppose you are a teacher in the university, you need the students to complete homework assignments after group discussion in the class. Which way do you think is better for students to complete them, doing the assignments in group to enhance the group learning benefits or doing the assignments in individual to set aside time for students to reflect the outcomes alone after discussion in the class? To our knowledge, there are immense amounts of concrete research on group work, but no similar study to discuss the ways to tailor the assignments to students after a group discussion in the published literature.

1.1 Complete Homework Assignments in Group VS in Individual

Homework assignments or after-class assignments are widely recognized as essential for students to work on outside the classroom activities in order to develop skills, reflection learning and improve understanding of the content related to the courses. Generally speaking, there are two assignment forms after class: doing homework in individual and in group. Compared with

individual assignment, more and more teachers have put great emphasis on group working, because research show that group work seems to be a highly effective means, students can understand deeper or establish new knowledge regarding the topic through collaborate with their group members and this may lead to successful learning.

1.2 The Present Study

The aim of this research was to find the answer which way is better for students doing their homework assignment after group discussion, in group or in individual? And there are two different types of homework task: a case-oriented task and a concept-oriented task. The two types of task were selected as common practice in some educational programs, especially in the courses refers to management education. A concept-oriented task is one that requires conceptual understanding of a given concept or theoretical view. While a case-oriented task is that learners are provided a case study and engage in a process of applying specific concepts \frameworks or theoretical knowledge to analysis the given case, discovering key factors at play. Generally speaking, concept-oriented tasks often involve a thinking process that usually starts with the general and moves to the specific, namely, a transformation from the abstract concept to the concrete example, which is often the opposite direction from that taken in the case-oriented task.

Achievement and perceived learning were selected as the evaluation criterion in this study basing on the former research [5]. Achievement is generally measured by actual grades that students have earned in the teaching and learning activities throughout the course and perceived learning is often self-reported learning by students themselves, which is defined as one's own perception of his/her, learning in the course. Above all, the study aimed to answer the following questions:

(1) After group discussion in the class, which way will better for students' homework assignment performance, in group or in individual?

(2) Do different types of homework assignments (case-oriented task/ concept-oriented task) have an influence on students' performance and perceived learning?

(3) While doing different homework assignments in group, concept-oriented task or case-oriented task, which one student will perform better?

2. Method

This paper presents a case study with university students in the classroom instead of a laboratory environment, that's because we wanted to preserve ecological validity as much as possible in order to generalize our results to more other authentic classroom settings. We carried out a two-factor quasi-experimental design: homework assignment form (group VS individual) and homework assignment type (concept-oriented task VS case-oriented task). According to the curriculum setting, students have three discussion classes during the first semester and as a part of the requirement of the course, they need to submit their assignments in one week after every discussion class. There were two possible methods of assigning the three homework assignments: two assignments into the concept-oriented task and one assignment into the case-oriented task, or one concept-oriented task and two case-oriented tasks. As we designed the assignments, considering case-oriented tasks are more common in management courses, the second arrangement was chosen in this research.

2.1 Participants

The subjects were 36 (27 females, 9 males) first year graduate students from a university of psychology school. Their age was from 21 to 26 (M = 23.19, SD = 0.21). They have enrolled in a same course named "Organizational learning and knowledge management". Given the fact that all

the participants are new student and the class size is small, in the first class of the semester, we used an informal interview to ensure that they all had no experience of taking the courses refer to knowledge management. Considering the size of the class involved in the experiment, all students in the class were randomly assigned to six groups. Thus, 36 students of 6 groups were assigned to the different task conditions. The research protocol was accepted by the local ethics committee.

2.2 Assignment Task and Materials

In accordance with the demands of the course, students need to complete one concept-oriented tasks and two case-oriented task, both of them were referring to a specific topic of the course content. The tasks and assessment criteria were co-designed by the course teacher and a research before the new term begins. The first case-oriented task was about Legend Group, whose innovation management was considered as a good case for management student. And the second case-oriented task refers to IBM published case study. In this type of assignment, students need to discuss with their group members about the case based on the learning materials in the class, and they should submit a paper after the discussion as a product for the task. The concept-oriented task was designed to make students comprehend the concept "Learning Organization", which is an important concept for organizational change in the area of organizational management. After the group discussion in class, the student also needs to submit a text report related to the topic.

For the homework assignment form, there are two conditions: doing the homework in group or in individual. In the group work condition, students need to work together with their group members to complete the assignment according to the instructions. And members in the same group only need to submit one assignment, the score of this assignment represents to every member's grades. In the individual work condition, every student needs to complete the assignment alone and submit the assignment in unit of person. Table 1 shows the difference between the group and individual task instructions.

Table 1: Differences of instructions between the group and individual task

Task instructions of group work	Task instructions of individual work
According to the discussion in the class, please complete this assignment. The assignment should be carried out by all your group of six. Your group can submit only one assignment in one week, and this group assignment score represents everyone's score.	According to the discussion in the class, please complete this assignment. The assignment should be carried out on your own. You should submit your assignment in one week.

2.3 Procedure

According to the design, the homework assignment tasks were operated in parallel with the course period. The concept-oriented task was started in the fifth week of the course semester and the first case-oriented task was started in the eleventh week, while the second case-oriented task was beginning in the eighteenth week in accordance with the course schedule. Students were given one week to complete each of the three homework assignment tasks. The submitted individual assignment and group assignment will be grade according to the criteria by two experienced teaching assistants.

After the first lecture class, all students were randomly divided into six groups, every group has a group ID, like g1, g2…g6 and the group has relatively fixed members for the knowledge management course in this semester. During the task periods, half of the groups complete the task in

group, the remaining half complete the same assignment in individual. Table 2 shows the study design.

Table 2: Research design of the homework assignment task

Group ID	Assignment		
	Task 1 Concept-oriented	Task 2 Case-oriented	Task 3 Case-oriented
g1	G	I	G
g2	G	I	G
g3	G	I	G
g4	I	G	I
g5	I	G	I
g6	I	G	I

Note: **G**-group work; **I**-individual work

2.4 Data Analysis

The analyses were based on students' assignments grades, which are graded by two teaching assistants. The two assistants marked the assignments independently according to the evaluation criteria which are set in advance and have showed high inter-rater agreement (r=0.82, p<0.01). To research the students' perceived learning, a question referring to students' feelings about activities in the course was administered to all students after each assignment. The participants need to respond to the question and rate their own perception on a 5-point scale. To further understand students' perceived learning, 6 students were randomly selected from each of the groups. They were required to accept a short interview to collect their open comments on the course design and group work. The interviews were carried out at the end of the research by a graduate research assistant and the transcripts of students' responses were analysed briefly according to the content.

For the purpose of the research, to compare student performance between the group and individual conditions after discussion in two types of task, the assignment score and survey data were analysed. For the case-oriented assignment, a within-subject design was used and paired-sample T test were performed, and for the concept-oriented assignment, since there is only one assignment, we ask half of the groups complete this type of assignment in group, and the other half complete it in individual. Considering that participants assigned to the two study conditions were with no interactions, we used a between-subject design. In the data analyse, we used Levene's test to test the equality of variance across the samples and the t-test results were adjusted the degrees of freedom using the Welch-Satterthwaite method for those items violating the equal variances assumption [2].

3. Results

3.1 Group Work VS Individual Work

The effects of assignment forms were examined by distinguish the differences between the group work and individual work in the concept-oriented and the case-oriented tasks respectively.

3.1.1. Concept-oriented task

Table 3 shows the descriptive statistics of students' assignment score and perceived learning of the class in the concept-oriented task, as well as the independent sample t-test results. The t-test

results showed that students who completed the assignment in group have got significantly higher scores than those completed the assignment in individual (t=6.087, df=34, p<0.001). As for the perceived learning, the mean of group work is higher than the individual work, but the difference is not significantly.

Table 3: Students' assignment score and perceived contribution for concept-oriented task

	Task form	*M*	*SD*	*t*	*df*	*p*
Assignment score	Group work	92.33	0.488	6.087	34	0.001***
	Individual work	85.86	0.944			
Perceived learning	Group work	4.39	0.118	1.862	34	0.741
	Individual work	3.89	0.241			

Note: Data were based on 34 participants. ***$p < .01$

Table 4 outlines the descriptive statistics of students' assignment score and perceived learning in the case-oriented task, as well as the paired sample t-test results. The t-test results showed that students who completed the assignment in group have got significantly higher scores than those completed the assignment in individual (t=6.734, df=35, p<0.001). As for the perceived learning for the assignment, students in group work reported having experienced a significantly higher level than those who have completed the assignment in individual.

Table 4: Students' assignment score and perceived contribution for case-oriented task

	Task form	*M*	*SD*	*t*	*df*	*p*
Assignment score	Group work	89.33	0.624	6.734	35	0.001***
	Individual work	85.07	0.555			
Perceived learning	Group work	4.25	0.108	2.671	35	0.011*
	Individual work	3.81	0.177			

Note: Data were based on 34 participants. ***$p < .001$, *$p < .05$

3.1.2. Interview results

Table 5: Students' comments on group assignment after discussion

Positive comments content	Negative comments content
• divide the work into small pieces, reduce workload(g1, g2,g3,g5,g6)	• Some members only focused on their individual part of the assignment(g3,g5)
• Promoting critical thinking and debate(g2,g3,g6)	• Too much relevant information(g1,g4)
• increase productivity(g3,g5)	• meaningless disputation(g2)
• Facilitating reflection(g2,g4)	• Waste time(g3)
• promote relationship with group members(g1)	
• in-depth understanding(g4)	

Note: g1, g2, g3… referring to group 1, group 2 group3...

For further understand students' perceived learning, students' open comments were analysed briefly according to the content. The results showed that almost all students randomly selected from different groups in the interview expressed a positive comment on the group assignment, one reason is that the whole work were divide into small pieces and it became more manageable for them to

complete. Of course, there are some other positive and negative comment on group assignment for various reason. The rest typical comments are summarized and showed in Table 5. Generally speaking, more positive comments on group assignment than negative comments after discussion class.

3.2 Case-oriented Task VS Concept-Oriented Task in Group Condition (Within-Subject Design)

Table 6 shows the descriptive statistics of students' assignment score and perceived learning in the case-oriented task and concept-oriented task in group condition, as well as the paired sample t-test results. The t-test results showed when students work together to complete a concept-oriented task, they have got significantly higher scores than the group work in case-oriented task (t=2.373, df=17, p<0.05). As for the perceived learning, students in case-task reported having experienced a higher level than those work together in the concept-oriented task, but the difference is not significantly.

Table 6: Comparison of assignment score and perceived contribution between two types of tasks

	Task type	*M*	*SD*	*t*	*df*	*p*
Assignment score	Concept-task	92.33	0.488	2.373	17	0.030*
	Case-task	90.67	0.498			
Perceived learning	Concept-task	4.39	0.118	-1.374	17	0.187
	Case-task	4.56	0.121			

Note: Data were based on 34 participants. *$p < .05$

4. Discussion

This study was explored the question how to complete the homework assignment after group discussion in the class. We investigated the effects of assignment forms (doing homework in individual or in group) and assignment task types (a case-oriented task or a concept-oriented task) on the students' achievement and perceived learning.

The result showed that no matter in the case-oriented task or concept-oriented task, students in the group condition got significantly higher scores than those who have completed the assignment in individual condition. Consistent with previous studies, collaboration learning does increase the academic achievement [4]. It is possible that one of the reasons why there was a significant higher grades in group assignments maybe that the whole assignment was divided into small pieces and as the students expressed in the interview that it made the task manageable and increased their productivity. Consistent with the research of Burdett and Hastie (2009), they have studied three hundred and forty-four undergraduate students majoring in Business and their result showed that compare with individual work, students liked group activities more because they were required to undertake less workload.

Another reason why there was a significant higher grade earned in group assignments maybe that, when assigning students to the condition that doing homework in group, their joint effort will help students to maintain a shared focus on group goal. This may support group cognitive process and help them perceive the interactive experience with their group members more deeply. That is, when doing homework assignments in group, the form of collaboration or collaboration context may promote the students to have a more positive reflection about their group work, and the student will report that they have experienced a significantly higher level of perceived learning.

After a group discussion, a group assignment also can improve students' scores significantly. The phenomenon may demonstrate that group discussion connecting with group homework, the

continuous group learning may deepen the co-operation, to some extent, further promote the academic achievement. However, when try to generalized the results to the other samples, it should be interpreted judiciously. Future research should combine cognitive studies and behavioural studies to reproduce the findings and get clear on the different impact on students between discussion in group and doing assignment in group.

With respect to the perceived learning in the case-oriented task situation, our result of data shown that students in group work reported have experienced a significantly higher level than those who have completed the assignment in individual. This result was aligned with theories of Activity Theory [3]. The Activity Theory suggested that activity characteristics, including task forms, motion, operation, as well as the dynamic relations between them will have an impact on students' learning. So teachers can provide effectual tasks or collaborative learning environments which can improve the reflection on students' learning process or past experiences.

In addition, we also want to research that in which group condition student will perform better, concept-oriented task or case-oriented task? And the within-subject design results showed that the same group students, when doing the concept-oriented task, they got higher scores than they got in case-oriented task, and the difference is significantly. That is, in concept-oriented group task, students will perform better. Consistent with activity theory, the task characteristics will have an effect on students' cognitive process [1]. The concept-oriented tasks solving needs the students to transform the abstract concept to the concrete example, in this problem solving process, group members can provide abundant examples from different perspectives and consequently help the students understand or establish new knowledge regarding to the concept. Future research is needed to identify that the reason in larger samples.

Acknowledgement

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