

Student Group Leaders Influence on Organisation of Group Members for Group Activities in Co-Operative Learning in Biology Classrooms

Ortaöğretim Biyoloji Sınıflarında İşbirlikli Öğrenme Yöntemlerinde Grup Liderlerinin Etkisi

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Abstract

In this study, the effects of employing student group leaders during co-operative learning activities in a secondary biology classroom in Turkey is examined. The study was carried out in a period of eight weeks in biology classes during which “ecology” unit was taught to the class of 36 students by using Jigsaw and STAD. The students were divided into groups of four and a student in each group was assigned as the group leader. The data was collected through interviews with group leaders and group members and through video recordings of one group continuously for eight weeks. The study revealed that student group leaders’ approaches towards the organisation of the group activities were either relationship or task related. The study is a pre-investigation of a more comprehensive study titled “Prevailing cooperative learning methods through group leaders and finding solution to problems occurred during the process”, lasted for 3 years and funded by Turkish Scientific & Technological Research Institution (TUBITAK) with the participation of 466 students in ten classrooms in five secondary schools across the city of Diyarbakir.

Key words: Student-centred learning, co-operative learning, group leaders, biology education

Özet

Bu araştırmada Türkiye’deki ortaöğretim biyoloji sınıflarında işbirlikli öğrenme yöntemlerinde grup liderlerinin etkisi araştırılmıştır. 36 kişilik biyoloji derslerinde sekiz hafta boyunca çevre ünitesi ayrılıp-birleşme tekniği ve öğrenci takımları başarı grupları yöntemleri uygulanarak işlenmiştir. Öğrenciler dörderli gruplara ayrılmış ve her gruptan bir grup lideri seçilmiştir. Veriler, grup liderleri ve üyeleri ile yapılan mülakatlar ve bir grubun sekiz hafta boyunca video kayıtları ile izlenmesi ile elde edilmiştir. Araştırma grup liderlerinin grup aktivitelerini organize etmede ilişki veya iş bağlantılı yaklaşım benimsediklerini ortaya koymuştur. Bu araştırma “İşbirlikli öğrenme yöntemlerinin grup liderleri aracılığı ile yaygınlaştırılması ve süreç içerisinde meydana gelecek problemlere çözüm üretilmesi” adlı TÜBİTAK tarafından desteklenen, Diyarbakır’daki beş ortaöğretim okulunun 10 sınıfında 466 öğrencinin katıldığı 3 yıllık çalışmanın bir ön araştırmasıdır.

Anahtar Sözcükler: Öğrenci merkezli öğrenme, işbirlikli öğrenme, grup liderleri, biyoloji eğitimi

1. Introduction

Co-operative learning methods have been a fruitful area of theory, research, and practice over the last two decades (Johnson et al 2000, Sharan, 1990, Ashman and Gillies, 1997, Lord, 1998, Kagan, 1992). A vast amount of research has been carried

out across numerous subjects to search for the effectiveness of these methods (Wohl and Klein-Wohl, 1994; Lazarowitz and Karnesty, 1990; Robertson et al 1994), and areas (Slavin, 1983; Slavin, 1985; Gillies, 2000; Johnson and Johnson, 1990; Kagan et al., 1985; Watson et al., 1994; Miller and Harrington, 1990; Gaith et al 2007), which culminated in the development of a number of new co-operative learning methods (STAD, TAI, Jigsaw, Learning Together, Group investigation and others). Co-operative learning refers to a set of instructional methods in which students work in small, mixed ability learning teams to maximise their learning (Johnson and Johnson, 1994, 1999). The main aim is to create a learning environment in which student achievement and cognitive skills can develop (Watson, 1991). In co-operative learning, groups as well as individuals are rewarded for their achievements. Thus peer norms support rather than oppose achievement (Slavin, 1984). Social skills such as leadership are important if a successful outcome is expected from co-operative learning groups (Johnson and Johnson, 1995).

Co-operative learning methods have become a major research field for the past three decades (Johnson et al, 2000; Lord, 1998; Ashman and Gillies, 1997). Yet, there are few studies carried out in order to investigate the use of co-operative learning in biology classes (Lord, 1998; Herreid, 1998; Colosi and Zales, 1998; Lord, 1994). Research on co-operative learning at school level has generally been in English, Humanities and the social sciences.

In her article, using co-operative learning in science education, Blosser (1992) gives the answer to the question ‘Why study co-operative learning in biology classrooms?’ provided by Johnson and Johnson (1991). In their response, they suggest that ‘a quick look through the table of contents of scientific journals will illustrate the co-operative nature of scientific inquiry, (Blosser, 1992, p.1)’.

One way of providing students with the opportunity to develop leadership skills is the appointment of group leaders during group activities (Keller, 1999;

Schneider et al., 1999, 2002). However, the role of group leaders in co-operative learning activities and development of this role as the group develops seems to be neglected in the literature (Karnes, 1990). Despite the importance of the contribution group leaders could potentially bring into the group activities, there seems to have been little attention paid to the role of group leaders in co-operative learning groups apart from some simple managerial roles (Hogan, 1999), such as encourager, praiser, recorder and material monitor (Kagan, 1992) that aimed at enhancing student contribution during the group activities. As early as 1978, Aronson saw the role of group leader as being almost as important as the role of the teacher in co-operative learning activities when he suggested that;

“The role of the group leader is patterned after the teacher’s role; they are both “facilitators,” a term we use for persons whose function is to lead a group, help the members look at how they are working together, and examine how they can improve their interaction in order to accomplish some task, p. 49”

In the same vein, Grobman (1999) argues that selecting group leaders from students enables us to see inside the world of groups and Hogan (1999) suggests group leaders can have a profound influence on whether other group members are included in or alienated from participating in important conceptual tasks, procedures and decisions.

2. Student leaders in the literature

Yamaguchi (2001) carried out a study to explore the importance of the group context in the emergence of leadership, dominance, and group effectiveness in children’s co-operative learning groups. She carried out her study with 30 elementary and secondary students. In her study she compared the effectiveness of mastery condition to performance condition. Using achievement goal orientation as a framework, she asked six groups to perform the task under a mastery condition and four groups to perform under a performance condition. Mastery condition referred to the environment that favoured learning and improving and performance condition

referred to the environment that favoured competition and social comparison. She found that under the performance condition, group members exhibited more dominance and negative behaviour, while displaying more leadership and positive behaviour under the mastery condition. She also found that the learning aspect of the mastery condition played an important role in the emergence of leadership, dominance, and group effectiveness.

Schneider et al (1999) carried out an investigation to predict, understand and test the durability of leadership behaviour. They focused on five different domains of student leadership: personality, interest, motivation, behaviour, self rated skills and academic ability. All five of these domains were measured by tests that were developed by different researchers. Students' motivation to lead, for example, was measured by using the Miner Sentence Completion Scale, which measures a person's generalised motivation to lead or manage.

Following up on this study the group carried out another study in 2002 (Schneider et al., 2002), to find whether personal attributes that are used to predict adult leadership were used by students to nominate the leaders among their peers.

There are also some studies that focus on leadership among gifted primary and secondary school students (Chauvin and Karnes, 1983; Karnes and Bean, 1990; Keller, 1999).

This study has used the context of a Turkish Biology classroom to explore a particular approach to co-operative learning. This approach involves student group leaders during group activities and investigates the student group leaders' influence on organisation of the group activities. This is an ideal situation in that students and teachers have not experienced this approach before and thus it would be possible to explore the ways in which roles develop. The study is based on the proposition that employment of student group leaders in co-operative group activities can support teachers in the use of co-operative learning methods in their classrooms.

3. Method

3.1. Instruments

Focus group Interviews with students and student group leaders, and video recordings of one group were employed as the data collection methods.

Focus group interviews were conducted to investigate the influence of the student group leaders on the group members and group activities during co-operative learning group work. By interviewing student group leaders at different intervals during the study period, their perceptions of the development of practice were captured.

Video recordings were used to record one of the groups during the eight weeks of the study. Video recordings provided the researcher with the following three benefits:

1. Video recordings accumulated aspects of interaction such as talking, gesture, and eye gaze that are not easy to capture through other methods.
2. It allowed the researcher to observe the same event repeatedly.
3. It yielded analytical benefits because it granted access to the inspection of the antecedents and consequences of the critical events (Roshelle, 2000).

3.2. Participants and Co-operative Learning methods used

The students participated in the study were from a general state school in Diyarbakir, a city in the southeast of Turkey. The school, at the time of the study had a population of 625 students. It accepts students from year 9 to year 11 with different backgrounds from its catchment area. The selection of the class was done through consultation with the teacher and the willingness of the students to be participants. The students and group leaders were trained in three 2-hour sessions through role play and practising working in groups. Jigsaw and STAD were the two co-operative methods used in the study.

3.3. Data analysis

The analysis of the data was done through identification of the main categories related to the group leaders' actions and behaviours in the group activities through interviews and supporting and confirming the findings by revisiting the video recordings of group nine.

The analysis of the data was done through the following three different phases:

1. Identification of the main categories related to the group leaders' actions and behaviours in the group activities through interviews,
2. Creation of sub-categories by grouping the differences and similarities among the group leaders' behaviours in their leadership practices (through forming concept maps and turning them into tables),
3. Supporting and confirming the findings by revisiting the video recordings of group nine. This enabled the researcher to compare the perception of students with their behaviours and actions captured by video recording.

4. Findings and discussions

The study reveals that the student group leaders' used two ways of dealing with the organisation of the group activities in leadership practice:

Table 1. Student group leaders' influence on the organisation of the group activities.

The approaches taken by the student group leaders for organisation of the group activities	
Relationship related	Task related
<ul style="list-style-type: none"> • Socio-emotional support Student group leaders' influence on group members' actions and behaviours related to social and personal problems • Conflict resolution Student group leaders' ability to resolve disagreements among the group members • Responsiveness Student group leaders' ability to be sensitive and reactive 	<ul style="list-style-type: none"> • Distribution of the task Student group leaders' ability to distribute the group tasks among the group members • Performing of the task Student group leaders' ability to resolve disagreements among the group members • Presentation of the task Student group leaders' influence on the whole class presentations

to the group members' needs	
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A. Relationship Related Organisation

Relationship related organisation of the group activities involved student group leaders' socio-emotional support for the group members, their efforts for resolving conflict amongst group members and for being responsiveness to the group members needs.

Socio-emotional support

Socio-emotional support includes the student group leaders' influence on the group members' actions and behaviours, which stem from social and personal problems such as disruptive behaviour and group members' timidity for participating in the group activities. This increases group cohesion. The "dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives" is referred to as group cohesion (Carron, 1982, p. 124). Chang and Bordia (2001) included four constructs in their conceptualisation of group cohesion: (1) group integration-task, (2) group integration-social, (3) individual attraction to group-task, (4) individual attraction to group- social.

In their study, Chang and Bordia (2001) found group cohesiveness had a positive effect on group performance. They reported that "when group members first started doing the task together, their feelings about similarity, closeness, and bonding within the team as a whole around the group's task is important to their perception of how much they have learned from the group project " (Chang and Bordia 2001, p. 399). Studies also found that group cohesion can be influenced by the group leaders (Rozell and Gundersen, 2003).

Two meta-analytical studies concluded that a small but positive relationship between group cohesion and group performance exist (Evans and Dion, 1991; Mullen and Copper, 1994).

In the following extract, student group leaders explain why they think disruptive behaviour occurs in some of the groups while it does not occur in other groups;

“at the beginning the tone of my voice was a bit strong. I think they were thinking I was seeing myself as privileged over them. In fact, I was trying to do the best for the group. Later, I changed my attitude. I did not want them to think they should do something because I wanted them to do. I wanted them to think we should do this because our group will do better. I think if you want your group members to be involved in the activity, you should create an environment that you should not feel that you are commanding them to do something. For example, when one of the group members does something disruptive, I tell them Y (the teacher) would assess us according to our behaviour in the groups as well as our task accomplishment. I do not tell them ‘stop talking. Or why do you not do your work.’ ...I tell them that kind of things to make them feel I am not seeing myself higher than them, I want them to see me lower than them.” (group leader one)

...many of our teachers don't treat everyone in the class fairly. ... when we ask about something we did not understand very well . they get angry. they would say ‘I cannot teach you something if you do not have good foundations for it.’. may be I did not have a good education previously. Does it mean I am not going to learn this time. If someone they like asks a question they would answer it.” (member in group five)

“...When the teacher tries to make us silent, we become more disruptive. They always spend most of the lesson with a few favourable people in the classroom. They don't care about us.”(member of group three)

It appears that students prefer to be supported directly by a respected classmate rather than the teacher who is seen to be only interested in the needs of a few students in the classroom. Also it is clear that those students who are unhappy with the classroom environment tend to challenge teachers and resort to disturbing behaviour. Students took part in the study had different educational backgrounds. While some students came from high achieving primary schools, and thus had a better education, the others were not so lucky. As is voiced in one of the quotations above, there were clear examples of teachers' indifference to students' shortcomings in this respect. Instead of trying to help these students to catch up with the more fortunate students by supporting them socially and academically, teachers tended to put the blame on students for this.

This kind of behaviour is likely to alienate students from subjects as well as school.

Conflict resolution

This involved the student group leaders' ability to resolve the disagreements among the group members. The types of disagreements among the group members were usually related to the amount of the work to be done by the members, or differences related to a certain part of the task or worksheet. The following view by one of the student group leader illustrates the way the group leader dealt with objections by group members who were complaining about the amount of work they had been given;

“...I tried to be as fair as possible while distributing the task among us. I left it for the group members to decide the part they would most like to do. If someone later came to me and said, “my part is too much for me” I would either change their part with mine or take some of their task for myself. Sometimes the group members wanted to change their task between themselves. In these cases, I usually allowed the members to do, as they wanted to do. But I had to make sure they didn't mix up their tasks and leave us in a difficult situation when we started doing the task together.” (leader of group five)

In the following conversation, the student group leader takes the initiative in resolving a disagreement about the correct answer to a question in the worksheet;

4-we are supposed to write the ranking in the classification for the next question.
3-we will write them in order starting from kingdom...
4-no we should start from the species...look! look!
3-Kingdom!
2-I suggest we start from species.
1-both ways are right. But three of us are in favour of starting with species. So we should start from the small ranking to the big ranking.(VT-2, 46-53)

In the conversation above the group members disagree about ranking of classification of living things while they are working on a worksheet. One of the group members suggests they start from the biggest, which is kingdom, while two of the group members insist on starting from species, which is the smallest in terms of ranking. Listening to this disagreement, the student group leader intervenes by first

letting the group members realise that both way are correct and secondly applying the rule of making a decision to go with the views of the majority by telling the group members they will classify the living things from the smallest to the biggest.

Conflict resolution is one of the important aspects of effective group organisation as conflict among group members is likely to hinder the group from completing the group activities successfully. There are different ways of resolving conflicts among group members. In order to resolve conflict among children in the group activities the group leader might try providing less control as the group develops. This invites children to try leadership roles and enables them to develop a stronger sense of self (McClure et al., 1992). Pescosolido (2002) suggests that leaders manage group members' emotions in order to resolve the conflict among the group members and that if group leaders exhibit emotions as well as managing the emotions of the group members when dealing with conflict among group members, they are likely to motivate group members better.

Responsiveness

Responsiveness, in this context, means the student group leaders' ability to be sensitive and reactive to the needs of the group members. It involved monitoring the group members' performance to make a judgement about each member's capability for doing their part, finding out the reasons behind any group member's poor performance and seeking opportunities to help the group members overcome these difficulties. Monitoring the group members' progress and finding out if they needed any help was seen as a priority by some of the student group leaders;

“...every week before we get together to discuss or do the task, I make sure that everyone knows their part properly. I prepare questions for everyone before the lesson. I usually study at home for the whole task. When I study, I prepare questions for each part...” (leader of group two)

By checking on the group members' preparation for the task the student group leaders identified any weaknesses of the group members in terms of their ability to

complete the task. The student group leader offered help to any poor performing member by either explaining the task further or rearranging their work for the task so that the members could overcome the difficulty easily. In the following extract the student group leader explains their attitude towards the less able group members;

“...often in our group I have to help certain group members for their part of the task because we are not all at the same level. Some of us in the group are more able than the other group members. I try to keep a balance when we share the responsibilities. I help the group members who seem to have difficulties with their tasks or who ask for my help.” (leader of group nine)

The majority of the student group leaders were responsive to the group members' need in this way.

B. Task Related Organisation

Task related organisation includes student group leaders' behaviours and actions during the organisation of the group activities that involved distribution of the task, performing the task and presentation of the task.

Distribution of the task

Usually, at the end of each session the task and all the material related to the task for the following week was given to all nine groups. The way the task was organised was left for the group leaders to decide upon, but there were differences in the ways tasks were distributed in each group. The student group leaders who distributed the task according to the ability of the group members thought this the only way to co-operate. In their view, it would have been difficult for the group to perform the task since a less able group member with the same amount of work in comparison with a more able group member would be likely to fall behind and that could cause the group to fall behind as a result. The following extract from one of the interviews with one of the student group leaders provides a good example of their behaviour;

“...when I distribute the group work, I think about the level of the group members. I say to myself ‘this person can do this, this can do that...’ I try to be as fair as I can. But if they want to do more or less than the part I have given, I change their part.”
(leader of group 8)

The student group leaders who distributed the task equally among the group members insisted on an equal contribution from all the group members. They believed that asking more able students to do more would result in less involvement of the less able group members thus it would give more able students more power to dominate the group, which they are already used to doing in the traditional way of learning. In the following extract the student group leader explains their approach towards distributing the work among the group members;

“...I think everyone should contribute equally to the group work. That is why I give everyone the same amount of work. If someone fails to do their part I try to help them to do their work. I would never reduce their work or do their work for themselves. If you give someone less work it is not fair to the other group members and also next week other group members would start to become lazy. If you give them equal work some group members find it difficult at the beginning but later they get used to it and start working hard. For example, our friend Z, this friend was very unwilling to work at the beginning. But now look at this friend. They work harder than all of us. If I had given them less work at the beginning because they are less able, they would not have made such a big improvement. So I don’t agree with some of our friends that we should distribute the task according to the ability of the group members.” (leader of group 4)

Performing the Task

Performing the task involves the student group leaders’ behaviours and actions related to the involvement of the group members’ in the execution of the task, the resolving of any problems related to performing the task and the group members’ understanding of the task. The attention given to the performance of the task was high for all student group leaders and the group members. But the nature of the execution of the task varied according to the approach taken by the individual student group leader for each of the groups. In general, these approaches to performing the task can be divided into two categories.

The first type of leader took the completion of the task as a high priority and demanded that all group members be prepared well for the tasks and expected them to be able to do their part. The student group leaders in this category distributed the task among the group members and asked each member to focus on their part in order to report it back to the group or contribute to the group presentation, completion of a worksheet or a test. Therefore the individual group members, with the assistance of the student group leader, took the responsibility for their learning. If they failed to do their share, the student group leader would warn them and try to prevent the failing group member from developing a habit of relying on the others by making them aware of the fact that without the individuals' help the group is not able to do the task completely. The following extract presents an example of that kind of leadership approach displayed by a student group leader;

“...of course as a group leader I have responsibilities. But the group members also have a lot of responsibilities. I cannot do the entire task. I distribute the task and want them to work hard. I tell them if they do not work hard and do not do their part, we will fail and when we do the test or worksheet, we will get lower marks than the other groups. ...I help them if they don't understand something or find it difficult to do. But they also should work hard. Usually everyone do their share. We don't have that much problem in our group we understand each other.” (leader of group two)

The second type of student group leaders also took the completion of the task as a high priority and demanded that all group members should prepare well for the task and expected them to be able to do their parts. But they also gave importance to the group members' learning. For this purpose they created some tests for each group member to find out if they were capable of doing their work, initiated some group discussions where the other members asked questions to a particular group member to test their learning. This was done for every group member in turn until everyone in the group was tested. Once the group decided that everyone was capable of doing their work then the group members moved on to do the group task such as preparing the presentation or doing a test or worksheet. The following extract demonstrates that kind of approach;

“ I prepare questions for each group member. When we get together I ask questions to each them in turn from the list prepared. The other group members also ask questions. In this way we know who studied, who didn't and how much members can do their part. If we find out someone didn't study, we give them the questions I prepared for their part and ask them to go and find answers for these questions. Later they come and we find out if they learnt before we start to do our common task together. Thus, the group members cannot escape because they know if they don't work at home they have to do it in the class. I think this way is better, because there is no way for escaping from the responsibilities.” (leader of group four)

Although, the student group leaders' strategies for dealing with the performance of the tasks varied according to the approaches taken by the individual group members, the focus of their attention resembled each other. All nine of the student group leaders paid attention to the involvement of all of the group members in doing the task, tried to resolve any problems that occurred while the groups were working on the tasks and tried to help the group members understand and learn the topic better. Goal setting and competition are the two aspects of successful group organisation techniques that are thought to have similar effects on goal variables and performance (Mulvey and Ribbens, 1999). Although competition among students is not always advocated, promotion of inter-group competition in a co-operative learning environment is a valid means of making group organisation effective as competition between groups increases group cohesion and group members are less likely to be in conflict with each other as they are focused on a common group goal.

Presentation of the task

This involves the presentation of the task by the whole group to the whole class and the presentation of the worksheets and tests and other materials to the teacher for assessment. There was little difference among the student group leaders in their approach to this. Their effect on the presentation of the task seems to be limited to the group members' involvement in the whole class presentations and their efforts

to overcome the group members' fear of failure in front of the other groups. The following view by one of the student group leaders displays their efforts in trying to prepare the group members for the whole class presentation;

“...it was difficult in the beginning. I had to persuade them that it was not going to be difficult. Some group members are shy. They usually do not talk much in the class. So they are not willing to take part in the whole class presentation. But after a while they get used to it. I think this is because it is much easier when you are a member of a group. If you are alone in front of the class, you feel frightened but if you are there with a group of students you do not feel scared.” (leader of group eight)

Indeed, once the students became used to presenting their work in front of the whole class, they became more assertive and it became a difficult task to select groups for the whole class presentations because of the demands from the all groups to volunteer for presenting their work. The following extract reveals the effect of group presentations on the students' behaviour in the classroom;

“...I used to be very nervous when I was talking in the class. Now it is much better, I enjoy being in front of the class with my group members... I think you feel much more secure to know that, if you say something wrong, the other group members will back you up. Also now we have more opportunity to talk in the groups and in the classroom. After a few times you get used to it. But previously, for example with Y (the teacher), there are people in class who did not have an opportunity to say a word since the beginning of the term...” (member in group four)

This view by the student group leaders confirms the findings in the literature about the general effect of co-operative learning that working in groups increases the students' self-belief and assertiveness.

The study revealed that the student group leaders employed relationship based and task based approaches whilst dealing with group organisation. Student group leaders, who attributed importance to relationships in group organisation, focused on socio-emotional support of the group members, gave more importance to conflict resolution and were more responsive to the needs of the group members. On the other hand, student group leaders who preferred a task based approach, paid attention to distribution, performance and presentation of the task. This identification of the

approaches taken by the group leaders as relationship and task based is supportive of the recognition of leadership approaches by Day (2001) and Addison (1985). However, the findings of the study did not support the arguments presented by Wilson (2002) that conditions where group activities take place alone decide whether a group leader would follow a relationship based or task based approach during the group activities. The present study suggests that the approach a group leader takes depends on an amalgamation of factors, such as the group leader's interest in the subject, group leader' personal traits, the group leader's status in the classroom, and a group leader's socio-economic and educational background in addition to favourable or unfavourable conditions that are suggested by Wilson (2002).

7. Conclusion

In this study the influence of student group leaders on the organisation of the group activities during co-operative learning was investigated. The study revealed that student group leaders take different approaches towards the organisation of the group activities. Some student group leaders attributed attention to relationship based organisation of group activities, while the other paid attention to task related organisation of the group activities. This divergence in their leadership behaviour seems to be caused by cultural, current learning environment in Turkish secondary schools, students' reaction to teachers' favouring behaviour and students' educational background.

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