Improving Student Participation in Group Project Work: Case Study

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Abstract

Group project work is a tool to share knowledge and skills among students and it is one way to assess students in a semester. However, a large number of students are not participating in group project work. This paper aims to improve students' participation and identify challenges that hinder students' participation in group project work. The primary data were collected by questionnaire and observation data gathering tools. Qualitative and quantitative research approaches and purposive sampling were used. Advanced Database Systems course was selected from the Information Systems Department and 13 groups were formed and each group has 5 members. The questionnaires distributed to all 65 students, and of which 61, were properly filled for analysis. Descriptive statistical analyses of percentage were calculated. The major factors that hinder students' participation were a shortage of time, lack of interest and awareness, lack of monitoring, group members not given individual responsibility, and assessment method. The introduced interventions to improve students' participation were creating awareness, distribute project guidelines, assigning roles, monitoring group members' participation, and prepare assessment criteria. After the implementation of the interventions and there is a great change in the participation of students in the group project work.

Keywords: Case study, group project work, interventions, students' participation

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Introduction

Education is the pillar of one's country development. Higher education is a critical factor in human capital development and innovation. The Ethiopian government is now working on the expansion of Ethiopian Higher Education Institutions (EHEIs) for the country's development (O'Neill, 2015). In the 2013 academic year, a national harmonized curriculum was implemented in all EHEIs of Ethiopia. Hence, the harmonized curriculum plays a great role to enhance the quality of education in Ethiopia. According to this, today most programs in EHEIs have their own harmonized curriculum. In Wolkite University under the College of Computing and Informatics, there are four departments such as Information Systems(IS), Computer Science, Information Technology, and Software Engineering. The IS department harmonized curriculum has different student assessment methods such as quiz, test, group project work, final exam, individual assignment, group assignment, and presentation. The IS harmonized curriculum most courses have group project work with a total load of 20%-30% (Sisay Adugna, 2013).

According to (Luios, 2018) case study group work is defined as a cooperative process that allows ordinary students to achieve extraordinary results. Also, explain that group work has a common goal where group members can develop effective, mutual relationships to achieve group member goals. Group work is individuals working together in a cooperative environment to achieve common group member goals by sharing knowledge and skills. Group project work is a tool to share knowledge and skill among students. Group projects often involve a large task that is undertaken over an extended period (Leister University, 2009). In the IS department, group projects involve students working together to complete a piece of assessed work. The most common tasks in a group project are study manual or automated systems, identify problems, analyzing a system, design a new system, and implement the system by writing up programming codes. Also, in a group project work the student design and implement network, design and implement a database, and develop mobile, desktop, and web-based applications.

In the case of the IS, department to maximize the sharing of knowledge and skill the student-organized into groups and top students are selected as the leader of the groups. In a group project work, working in small groups, a group of five students formed to discuss a particular issue or perform a particular task. The group arrangement is based on a 1 to 5 (one to five) principle which means in each group there are four group members and one group leader and the group leader have higher academic performance than other group members. Most of the time each group has five group members. Group project work is one of the student's assessment methods that covers one semester (Sisay Adugna, 2013).

Group project work helps to develop group work skills, develop leadership skills, and encourage learning from one another, and improve knowledge and skill sharing. Also, it manages an assessment in large classes with limited resources, students gain a better understanding of themselves and increase productivity and academic performance (Harris, 2008). Moreover, group work provides the opportunity to develop many interpersonal skills such as collaboration, communication, cooperation, delegation, diplomacy, leadership, negotiation, organization, responsibility, time management, and tolerance (Adelaide, 2014). However, group work has problems such as pressure from the group to conform to the majority opinion, an individual may dominate the discussion, some group members may absent, and some members may rely too heavily on others to do the work (Burke, 2011).

In the IS Department curriculum, most of the courses have group project work assessment methods. Since group project work enables the students to work together, to communicate with each other, to understand and implement the course objective, and to share knowledge and skills. However, a large number of students are not participating in group project work. This leads to a lack of knowledge in each course, increases dependency, reduces the quality of education, demoralizes group leaders and teachers, difficult to implement active learning methods, and overloaded the group leaders. So, to improve students' participation in a group project work have chosen this topic to do this research. This case study aims to improve students' participation in group project work. This study answered the following questions:

1. What are the challenges that hinder students' participation in group project work?

2. What are the possible interventions to solve the challenges?
3. How can we implement solutions to enhance student's participation in group project work?

Related Works

In (Davis, 1999) stated the advantage of group work and methods to form effective group work. The advantages are increased students' participation in all components of the course, a better understanding of each course, improved skills in the course, and increased interest in self-directed learning projects. The paper suggested different methods that make the group work more success such as assigning group tasks, teaching students to work in groups, forming and guiding groups, evaluating group work, and experimenting to learn.

Sewnet Tesfaye et. al has studied to improve second-year tourism management Students' participation in active learning methods like group discussions, demonstrations, and presentations and determine factors that hinder students to participate actively in the class and out the of class. Descriptive research method and observation and questionnaires data collection tools were used to collect the primary data. Their findings of the study exposed that about 75% of the students assured that group discussion gives them more chance to participate freely in the class than presentations and demonstrations. The study indicated the challenges that hinder student's active participation was a poor academic background, shortage of time, shyness, requirements for presentations, poor communication skills, and lack of preparation. Finally, to improve the student's involvement in their learning, the first motivate them by calling their name, and teachers had better be friendly, sociable, and approachable to students(Sewnet Tesfaye, 2015).

This paper (Burke, 2011) presented four-stage methods that can improve the group member's participation. In the first step, the group task should be designed based on the curriculum and the second step focuses on teaching the students to work in a group. In the third stage, which involves monitoring the groups and group members. The last stage and the most important to the students is the assessment of the groups and the group members. The teacher must develop concrete rules for grouping and assessing the student. According to (Weimer, 2014) departments now have students do some graded work in groups. The task may be, preparation of proposal or report, collection, and analysis of data, a presentation supported with visuals, analyze and design a system, develop a system, and creation of a website. The groups produce quality work better than what the students could do individually and the students to learn how to work productively with others (Burke, 2011).

The authors in (Hansen, 2006) recommended ten methods that can improve students' involvement or participation in group discussion. Some of the recommended methods are: emphasize the importance of group work, teach group work skills, use team-building exercises to build cohesive groups, make the workload reasonable and the goals clear, consider roles for group members, provide some class time for meetings, and require individual members to keep track of their contributions. Lynda Kriflik et al is aimed to improve student's reactions, facilitate student ability to resolve group issues, highlight group work as an important attribute, and to improve perceptions of the benefits of group work. To guide teachers and students through group work has prepared the introductory activity, assessment process, and process evaluation strategies. These strategies comprised a handout guiding teachers and students through group work considerations as an introductory activity, a template for peer assessment, and a template for student evaluation of the group work (Lynda Kriflik, 2007). Also, (Ashley V. Whillans, 2018) this works to improve students' engagement in research focus universities.

In (Kasa, 2016) studied experimental action research to improve first-year chemistry department student's participation in the classroom. To collect data, both interview and observation methods are used as a data-gathering tool. To improve student's participation in a classroom different action strategies were taken such as give advice, changing the seating arrangement, positive reinforcement, and using active teaching methods. Both quantitative and qualitative research approaches were used and the data were analyzed by using Microsoft Excel. The findings of their study put into three categories such as level of participation, the teaching method of the instructor, and problems of students. Regarding this, the author increases the behavior of students actively participates in the classroom.

This case study (Fesiha M. Guangul, 2018) has present improvements in student's participation in

classroom group tasks. To improve student's participation in classroom group tasks different techniques have been introduced. Carpentry and Joinery II (WT-392) course was selected from Wood Technology Department. The selected course was taken by 27 students and five groups were formed. Ten group tasks have prepared; the five tasks were distributed on the first day to the group members without introducing the techniques. On the other day, the remaining five group tasks were distributed to the same group and eight techniques were introduced to enhance student's participation in classroom group tasks. Before implementing the techniques only 10(37%) of students were able to summarize the class group task satisfactory from the groups. However, after implementing the techniques 24(89%) students have summarized their group tasks satisfactory.

Methods

In this study, questionnaires and observation data gathering tools have used. The questionnaires contain both open-ended and Likert rating scale closed-ended questions which were developed based on the objectives of the study. This study used, purposive sampling technique to select all second-year Information System department students from first-year to fourth-year students. Advanced Database Systems course was selected from the Information Systems Department at Wolkite University. The total number of Section A and Section B second-year students that take the selected course was 65 and all of 65 students were selected. The number of Section A and Section B students is 35 and 30 respectively. There are 13 groups and each group has five members. In total, 65 questionnaires were distributed to all second-year Information Systems students, and 61 were appropriately filled. A descriptive research method such as a percentage has been used. Also, both qualitative and quantitative research approach has been used to provide more comprehensive answers to the research questions. After the data is collected from the respondents, the descriptive statistics method has used to analyze the data by using SPSS 20.0.

Data Analysis and Finding

In this section, the results from the key close-ended questions presented in the survey form. The findings of the study answered that 49.2% of students strongly agreed and 26.2% of students agreed that preferred group project work because which gives more chance to them to share knowledge and skills. About 4.6% of students strongly disagreed and 9.2% of students disagreed with group project work because a large number of students were not participating in group project work. The remaining 4.6% of students were neutral with group project work. Also, the study answered that 9.2% of students strongly agreed and 46.2% of students agreed on group project work as the best student assessment method. About 4.6% of respondents are neither agreed nor disagreed and the remaining 7.7% of respondents strongly disagreed and 26.2% disagreed with the group project work assessment method. The respondents stated that about 38.5% of projects or five group projects were done by group leaders only. The remaining four group members simply come to learn from the group leaders after the project was completed without any involvement. About 46.2% of students stated that six group projects were done with only two students participation and the remaining three students did not participate until the project was completed. About 9.2% of the project or one group project has six group members, this project worked with only three students' participation. The remaining three students did not participate until the group project was completed. The remaining 6.2% of respondents not appropriately filled the questionnaires.

Here below, the results from the key open-ended questions in the survey form have discussed. The respondents frequently answered the problems that occurred interacting as a group member are an absence of group members, lack of interest, shortage of time, late during discussion time, and disagreement. Sometimes the group leaders are careless and not motivate their group members. Also, some group members are not easily understanding the project. As the respondent mentioned most of the time students consider group project work is the responsibility of group leaders. So that group projects were done by the group leaders and other group members are ready for only what the teacher could ask them during project presentation. Also, some students need only mark but not knowledge and skill from the given group project. In another open-ended questionnaire, the group members don't understand the benefit of working together. Since the lack of monitoring, the task is not divided, individual responsibility not given to each group member, the assessment method, and the project are

given to the students around at the end of the semester. In many cases, the group leaders don't give an assignment and role to the group members. A large number of respondents frequently stated that these factors as the main factor that hinders student's participation in group project work.

The preference of the current group member's arrangements in group project work has investigated. The current group arrangement is based on a 1 to 5(one to five) principle i.e. each group has four group members and one group leader. To implement a 1 to 5 group arrangement principle, first, the student with high academic performance and high CGPA is selected as a group leader. Then, select the student with medium academic performance and medium CGPA and then select the student with low academic performance and low CGPA. This group arrangement helps the student to share knowledge and skill. According to this, most respondents have preferred the existing group arrangement.

The factors that hinder student's participation in group project work have identified. As per the response of the majority of the respondents, the following factors have been stated frequently as factors that hinder students to participate in group project works: Shortage of time, lack of awareness, lack of interest, lack of monitoring, group project tasks are not divided, group members not given individual responsibility and group evaluation have a higher mark than individual evaluation.

Interventions

In this study, five interventions have implemented to improve student's participation in group project work. The implemented interventions are creating awareness, prepare project guidelines, assigning roles, monitoring student's participation and contribution, and assess the student both individually and in the group.

Creating Awareness: the first implemented intervention was creating awareness about the benefit of participating actively in group project work. So that prepare notes about group project work purpose, benefit, and the outcome of working effectively in a group project and distributed to the student.

Preparing Group Project Guideline: The second implemented intervention was preparing and distributing project guidelines that cover all chapters of the course. This makes it easier to do the project step by step, give an assignment to the group members, monitor the group project progress, and to evaluate group member's contribution to the project.

Assigning Roles: The third intervention was identifying and assigning roles to each group member such as group leader, facilitator, reporter, recorder, and checker. The roles of the students have been assigned depending on the students' interest, the goals of the group project work, and the size of the group members in one group.

Monitoring Students' Participation and Contribution: the fourth implemented intervention was monitoring group members' participation and contribution to the group project work. Also, monitor students' discussion points to record what they did during their meeting and record the assignment given to each group member for the next group work meeting.

Assess the Students' Individually and in the Group: the fifth implemented intervention was evaluating the students both individually and in the group. The advanced database project work total load was 20 points(mark), from this individual evaluation has 15 points and group evaluation has 5 points. This implemented intervention planned to evaluate the students both individually and in a group.

Implementation of the Interventions

After identified the five most appropriate actions, the interventions were implemented in the middle of the semester. One semester has sixteen weeks' length. The participant students in each group project work randomly observed for two consecutive months before implementing the interventions.

First, create awareness about group project work purpose, advantage, and the knowledge, and skills that need to be shared among group members. The training was given for the student to create awareness of the group project work. Second, the advanced database systems course has selected, it has six chapters. Then appropriate questions for group work starting from chapter one to chapter six has prepared. Then write each question sequentially, this helps the student to understand the project

questions easily. After this, both softcopy and hard copy project guidelines has distributed to the student. Also, based on the advanced database project guideline, the sample project has prepared and distributed to the student. Moreover, in each session, the course instructor randomly asked one group project title and give direction to what they include in their project.

In the third intervention, each group member has assigned a role. The assigned roles were the group leader, facilitator, recorder, timekeeper, and checker. The student who has a good performance assigned as a group leader. The group leader leads all group members' activities and gives a task to the group members. The facilitator role assigned to any group members that keep the group members on task by creating a positive atmosphere and do the given task to the next meeting. The timekeeper keeps deadlines of the project, makes sure meetings started on time, prepare a schedule, make sure the tasks completed within a given time, and do the given tasks. The recorder takes notes summarizing group members' discussions, keeps all necessary records, serves as a group spokesperson, and do the given tasks for the next meeting. The checker checks to make sure all group members understand the project and do the given tasks for the next meeting. In the fourth intervention, group project monitoring form has prepared to monitor the group members' participation and contribution to the project. The monitoring form has an attendance sheet to take the active participant group members' attendance, questions to evaluate the group members' contribution to the project, and group members' discussion points.

In their first meeting, each group leader gives a task for their group members to be submitted for the next meeting. The timekeeper prepared a schedule and set deadline, the recorder records each group member assignment and role. In their next meeting, each group member submitted their tasks to the group leader and discussed it together. The checker checks whether the group member did their tasks or not. After this, the group leaders evaluated the group members' participation in the group project from a very low contribution to a very large contribution.

Table 1. Students participate in group work before and after introducing the interventions.

Groups	*Before introducing the interventions* In all meetings	After introducing the interventions					
		In the 1st meeting	In the 2nd meeting	In the 3rd meeting	In the 4th meeting	In the 5th meeting	In the 6th meeting
Group 1A	2	5	5	5	5	5	5
Group 1B	1	1	1	2	2	2	2
Group 2A	1	5	5	5	5	5	5
Group 2B	2	2	2	2	2	2	3
Group 3A	2	3	4	3	3	3	3
Group 3B	1	5	5	5	5	5	5
Group 4A	3	4	5	5	5	5	5
Group 4B	1	5	5	5	5	5	5
Group 5A	2	3	3	4	3	3	3
Group 5B	1	5	5	5	5	5	5
Group 6A	1	2	5	5	5	5	5
Group 6B	2	3	3	3	3	3	3
Group 7A	2	5	5	5	5	5	5

The individual and group presentation evaluation methods have been prepared and implemented. The evaluation criteria were distributed for each student. The group work evaluation criteria have individual evaluation criteria with 15 marks and group evaluation criteria have 5 marks. The advanced database systems course project manual has 34 steps the student must know each content of their project. Because during presentation time the presentation portion was given randomly to each student by their examiner teacher from their document. Each student has randomly selected and given 10 minutes for the presentation.

Evaluation of the Interventions

In this section, the changes as a result of the interventions taken, the practice changed and the students benefit from the interventions have evaluated. After creating awareness, the students were understood the purpose of the project, the significance of working in a group project and the skills and knowledge's that need to be shared among group members. Regarding this, at meeting six about 83% of students were interested and motivated to do in group project work. Before the interventions were introduced about 32% of students participated in group project work. As the evaluation showed that 55.4% of students preferred the advanced database systems course project guideline. After implementing the group project guideline, the group leaders can give tasks easily, give responsibility to the group members easily, and minimize the group leader's workload. Furthermore, the course instructor can easily monitor their progress and makes the group members actively participate in group work. Assigning a role has improved students' participation in group project work. The assigned roles have created a positive atmosphere among group members, enhanced student's cooperation, and complete the given tasks on time. When students work in groups without a designated role they were spent their time on unrelated issues and depart from the topics; so the presence of the designated roles gave a critical advantage. Also, the assigned role improved students' group work skills, student's communication skills, knowledge, and skill-sharing, and make each group member responsible.

Before implementing monitoring intervention only, the group leaders were asked about the project in the class and out of the class. However, after implementing monitoring intervention, the students actively participated and contributed to the project. Also, most students were asked questions about the project in the class and out of the class. The student who has a group leader and recorder role submit their project progress, group members' participation, and contribution monitoring form to the course taught at the specified time. After introducing the individual and group student's assessment method the student gave high emphasis to the project. The examiner gives randomly a presentation portion for each student. Each student has present the given project portion for 10 minutes and the student gave attention to the project because individual evaluation has a higher mark than group evaluation. This intervention has motivated each student to actively participate and contribute to the group project. The table below shows that the evaluation of participant students before and after implementing the interventions.

Table 2. Evaluation results before and after implementing the interventions in group work.

Number of participant students	Before implementing the interventions	After implementing the interventions
Group project done by 1 student	38.5%	0.0%
Group project done by 2 students	46.2%	7.7%
Group project done by 3 students	9.2%	7.7%
Group project done by 4 students	0.0%	23.1%
Group project done by 5 students	0.0%	61.5%

As shown in Table 2 the participation of students in group project work shows significant enhancement after implementing the interventions than before implementing the interventions. Before implementing the interventions, five group projects (38.5% of projects) were done by group leaders only. The remaining four group members were coming to learn from the group leaders after the project was completed. About six group projects (46.2% of projects) were done by only two students and the remaining three students did not participate until the project was completed. Moreover, about 9.2% project or one group project has six group members, this project was done by only three students' and the remaining three students did not participate until the project was completed. However, after implementing the interventions about eight projects (61.5% of projects) were completed with the participation of all group members. In other words, 40 students have to work in eight groups, all actively participated in their group projects. The three group projects were done by four students, but one student in each of the three groups did not participate until the project was completed. One group project was undertaken by three group members and the other two members of the group did not actively participate within their group project. The remaining group project was undertaken by two group members only and the other three members of the group did not participate. As the evaluation

showed that, the five interventions have improved the involvement of students in group project work.

Conclusion

Group project work is a tool to share knowledge and skills in higher education. In the literature, identified data collection tools, research approaches, research analysis methods, and data analysis tools have investigated. Following prepared the questionnaires and distributed to all 65 Information Systems Department second-year students, and collected properly filled questionnaires for analysis. Next, analyze quantitative data, descriptive statistical analyses of percentage were calculated using SPSS. After this, the study identified that the major factors that hinder student's participation in group project work from the qualitative data. The identified factors that hinder students' participation were a shortage of time, lack of interest, lack of awareness, lack of monitoring, group members not given individual responsibility, and poor assessment methods.

The study obtained about five group projects (38.5% of projects) were done by group leaders only. About six group projects (46.2% of projects) were done by only two students and the remaining three students did not participate until the project was completed. Moreover, about 9.2% project or one group project has six group members, this project was done by only three students' and the remaining three students did not participate until the project was completed. Five interventions were introduced to improve the student's participation such as created awareness, prepared project manual, assigned roles, monitor group members' participation, and contribution, and prepared group and individual evaluation criteria. After implementing the interventions in 61.5% projects or eight projects all group members have participated and in three projects (23.1% of projects) four group members actively participated. One group project was done by three group members and the remaining one group project was done by two group members only. As the evaluation showed that, the introduced interventions have increased students' participation in a group project work. Finally, the introduced interventions have improved students' participation in group project work so we recommend the higher education institutions to apply these interventions in their teaching and learning progress.

Disclosure Statement

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