The impact of the group work strategy on the Students' academic performance

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Abstract:

There is a growing trend of group work strategy among the students from various disciplines in higher education institutions. This study has been conducted to find out whether there is a relationship between the group work study and the students' marks in the exams, which reflect their academic performance. The focus group is Bachelor of Technology students in higher educational institution settings. Quantitative research method was used to conduct this research. The results exhibited that the group work strategy helps the students to improve their academic performance. Also, it was observed that the group work strategy helps reduce students' stress and improve their emotional well-being. The results of this study will be helpful to the academic administrators in creating a better academic environment for the students.

Key words: Group work strategy, student performance, higher education, technical education.

Introduction:

There is a strong trend amongst the classroom instructors of exploring and adopting new teaching-learning strategies to improve the academic performance of their students who want to earn the best grades/marks in their exams (Bertgold & Shanoyan, 2024; Bonebright, 2010; Fischer et.al. 2023). They are always eager to try better practices and are continuously making efforts to devise strategies to achieve this goal. The instructors are using a group formation strategy to improve student experience and their academic performance (Borek and Abraham, 2018; Cornell et. al. 2023; Hernandez, 2002).

The group work strategy involves the students working in groups or teams to accomplish a learning activity. It needs to develop an understanding of the given activity, the preparation, execution, application, and evaluation components (Karimi & Mantenfel, 2020; Vasquez et. al. 2020). As the previous research shows, this approach has been widely adopted by the instructors in higher education institutions across various disciplines, including arts, sciences, commerce, technology, economics, and social sciences etc. (Samudra et. al., 2024). The instructors make the student groups keeping in mind the interest of the individual students, their skills, personality, perspective, and motivation (Michaelson et. al. 2002; Riebe et. al 2016; Weber & Mayer, 2014). After the group formation the instructors involve the students in the teaching -learning activities.

The problem:

There are more than 2.9 million students in the Bachelor of Technology programmes in Indian higher education institutions. Despite the availability of various studies conducted to establish a relationship between the group study strategy and student performance, there is hardly any such research has been conducted in the Indian higher education environment.

Therefore, the purpose of this study is to find out the relationship between the group work strategy and the academic performance of the B. Tech. students in the Indian context. This study was conducted in a private university in India situated in the state of Uttarakhand.

Methodology:

The full-time undergraduate students registered under the B. Tech. program, namely Applied Petroleum Engineering-upstream (APE-UP), and Computer Science-Cyber Security and Forensic (CS-CSF) in an Indian private university, were the participants in this study. The course name is English. There were 120 students in each of these batches. These students were divided into three sections of equal numbers based on their academic performances in previous semesters. The middle section, i.e. average performing students were picked as this group has the best probability of exhibiting the effect of this group formation strategy experiment. These 40 students were identified from each of these programs, but they were allowed to appear in the mid-semester exams as individuals to record their academic performances for the sake of comparison after the group work strategy experiment. Therefore, just after the mid-semester exams, these students were divided into 16 groups with 5 members in each group and were encouraged to work as groups. Their academic performance was evaluated in the end-term exams and compared with the mid-semester exams. The members of the same group cooperate, interact and help each other in order to achieve a common goal. It requires having a desire and passion to work within the groups in which everyone feels responsible for learning and teaching each other in order to achieve the required goals. To avoid the errors due to behavioral changes and other indirect parameters e.g. style of interaction with the students, punctuality, regularity, motivation, voice modulation, evaluation etc.; the courses were selected that were taught by the same faculty. The attendance of

the students, in terms of the percentage, was obtained from the data management system of the university.

The academic results of the students in the form of grades were taken from Student Record and Examination Department (SRE) of the university. This is a ten-point grade system and grades between 10 to 4; (10 for O, 9 for A^+, 8 for A, 7 for B^+, 6 for B, 5 for C^+ and 4 for C) are awarded based on the performance of the students in mid-semester and end-semester examination.

Result and discussion:

As mentioned earlier, 80 full-time undergraduate students participated in this study. After forming the groups, 8 groups were studying the B. Tech. program, namely Applied Petroleum Engineering-upstream (APE-UP), and rest 8 groups were studying Computer Science-Cyber Security and Forensic (CS-CSF), and the course name is English. The academic performance of these students was recorded before they started working in the groups. To avoid the complexity, the average grades of all 5 students, part of a group, were considered. This approach was helpful to understand the difference in the academic performance in the mid-semester examination, when these five students were not working in a group; to the end-semester exams. It is important to mention that the group work strategy was implemented between the mid-semester and the end-semester exams.

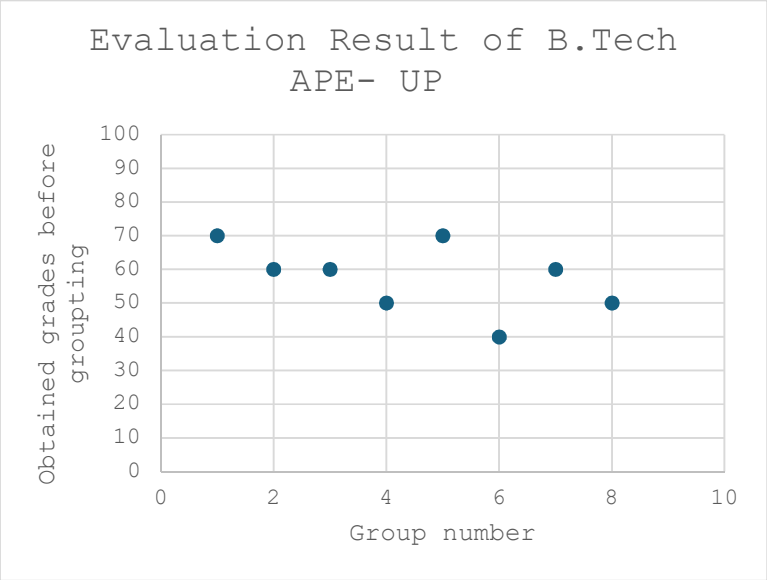

Fig 1(a): Result of mid-semester exam without group work strategy for B. Tech APE UP batch

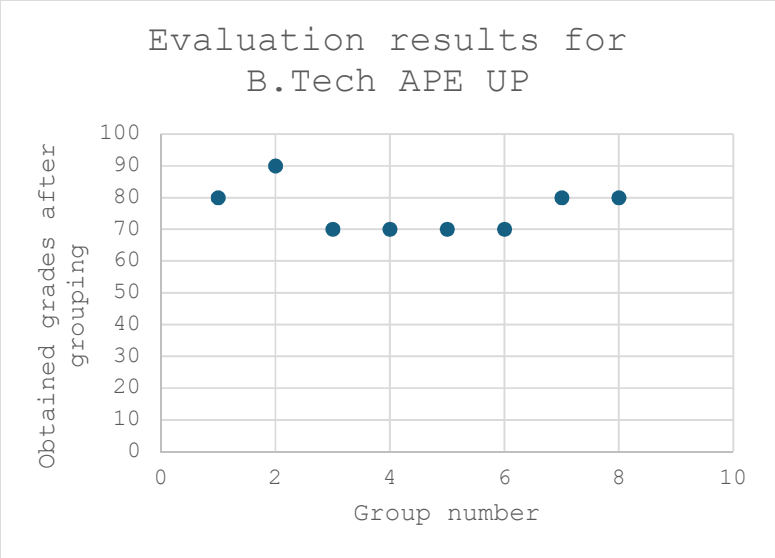

Fig: 1(b): Result of end-semester exam after implementing group work strategy for B. Tech APE UP batch

The results obtained for B. Tech. (APE-up) program are presented in the Fig.- 1(a), for mid-semester exam outcome and in the Fig.- 1(b) for end-semester exam outcome. Out of total 8

groups, the average grade of 1 group was C, 2 groups C^+, 3 groups B, and 2 groups B^+ in the mid-semester exams. This is important to mention that these grades are based on the marks obtained by the students and are converted to grades. After the group work strategy was implemented, it was observed that the average grades changed to 4 groups B^+, 3 groups A, and 1 group A^+.

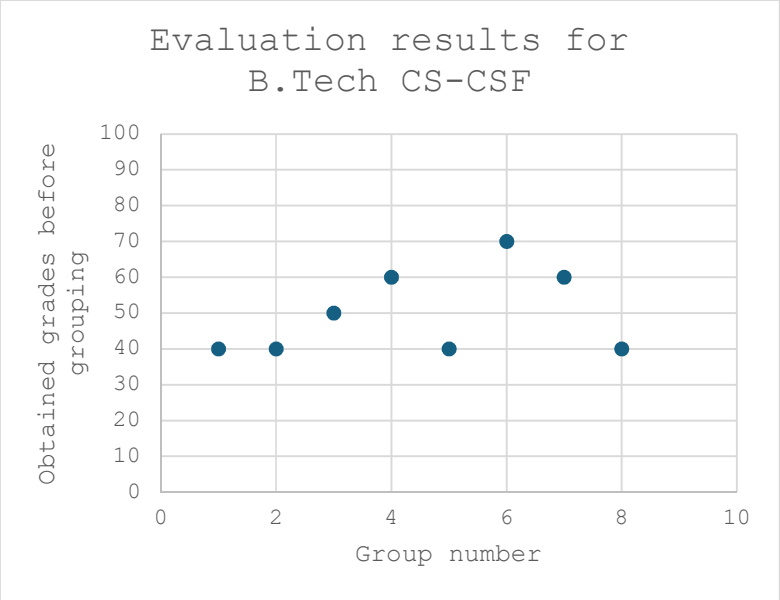

Fig 2(a): Result of mid-semester exam without group work strategy for B. Tech CS-CSF batch

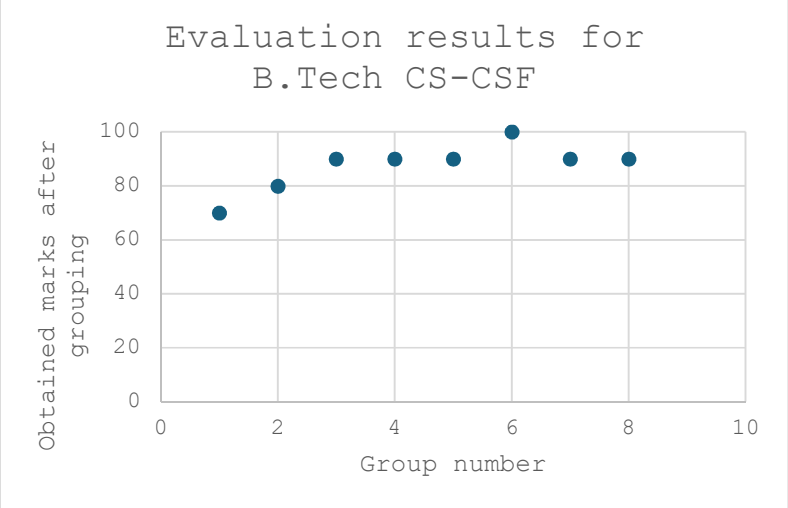

Fig 2(b): Result of end-semester exam after implementing group work strategy for B. Tech CS-CSF batch

Similarly, the results obtained for B. Tech. (CS)-CSF The program are presented in the Fig.- 2(a), for the mid-semester exam outcome and in Fig.- 2(b) for the end-semester exam outcome. Again out of total 8 groups, the average grade of 4 groups were C, 1 group C^+, 2 groups B, and 1 group B^+ in the mid-semester exams. After the group work strategy was implemented, it was observed that the average grades changed to 1 group B^+, 2 groups A, 4 groups A^+ and 1 group O. These results clearly show a remarkable improvement in the academic performances of the students of both programs.

The results suggest that the group work strategy is advantageous to the students to improve not the academic grades. Also, there were many more positive changes observed in the students, each such change may be studied further for a quantitative research aspect. For example, the scholars developed a sense of individual responsibility, a tendency for cooperation amongst the group members, exchange of ideas, self-discipline and self-learning, improved participation in the problem-solving, and developed self-confidence.

Conclusion:

The group work strategy is very effective teaching method, suitable to improve students' academic performance by improving communication and collaboration amongst the students. When students work in groups, they discuss ideas, methods and concepts. Also, they start learning from each other's perspectives to develop an understanding of a problem. Group work also develops important skills such as problem-solving, critical thinking, teamwork, and leadership.

Additionally, stronger students can support weaker students, as they may communicate without hesitation in a smaller group in comparison to discussion in the entire class.

References:

Bergtold and Shanoyan, (2024) Assessment of group formation methods on performance in group-based learning activities, Frontiers in Education, Doi 10.3389/feduc.2024.1362211

Bonebright, D. A. (2010). 40 years of storming: a historical review of Tuckman's model of small group development. Hum. Resour. Dev. Int. 13, Ill—120. doi: 10.1080/13678861003589099

Borek, A. J., and Abraham, C. (2018). How do small groups promote behavior change' An integrative conceptual review of explanatory mechanisms. Appl. Psychol. Health Well Being 10, 30—61. dot: 10.1111/aphw. 12120

Connell, G. L., Donovan, D. A., and Theobald, E. J. (2023). Forming groups in a large-enrollment biology class: group permanence matters more than group size. CBE Life Sci. Educ. 22. dot: 10.1187/cbe.22-08-0172

Fischer, M., Rilke, R. M.. and Yurtoglu, B. B. (2023). When, and why. do teams benefit from self-selection? Exp. Econ. 26, 749—774. doi: 10.l007/s10683-023-09800-2

Gasevié, D., Zouaq, R., and Janzen, R. (2013). “Choose your classmates, your GPA is at stake!”: the association of cross-class social ties and academic performance. km. Behav. Sci. 57, 1460—1479. doi: 10.1177/0002764213479362

Hernandez, S. A. (2002). Team learning in a marketing principles course: cooperative structures that facilitate active learning and higher level thinking. J. Mark. £duc. 24, 73—85. doi: 10.1177/0273475302241009

Karimi, A., and Manteufel, R. D. (2020). Student study group and design team formation based on academic performance metrics. / High. Educ. Theory Practice 20, 139—133.

Michaelson, L. K., Knight, A. B., and Fink, L. D. (2002). Team-based learning: a transformative use of small groups. Westport, CT: Praeger Publishers.

Riebe, L., Girardi, A., and Whitsed, C. (2016). A systematic literature review of teamwork pedagogy in higher education. Small Group Res. 47, 619—664. doi: 10.1177/1046496416665221

Samudra, S., Walters, C., Williams-Dobosz, D., Shah, A., and Brickman, P. (2024). Try before you buy: are the benefits to a random trial period before student choose their collaborative teams* CBE Life Sci. Educ. 23. doi: 10.1187/ cbe.23-01-0011

Vasquez, E. S., Dewitt, M. J., West, Z. J., and Elsass, M. J. (2020). Impact of team formation on teamwork effectiveness and performance in an upper-level undergraduate chemical engineering laboratory course. litt. J. Eng. Educ. 36, 491—501.

Weber, L., and Mayer, K. (2014). Transaction cost economics and the cognitive perspective: investigating the sources and governance of interpretive uncertainty mud. Manag. Rev. 39, 344—363. doi: 10.5465/amr.2011.0463