A Study of Teamwork Activity Through Group Formation Theory

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ABSTRACT

Teamwork is widely recognised as an essential pedagogical approach in higher education for promoting active learning and developing transferable skills. However, the effectiveness of teamwork remains inconsistent due to variations in group dynamics, interaction quality, and group formation practices. This study aims to provide a theory-driven examination of teamwork activity through the lens of Homans's Group Formation Theory, focusing on three core components: activities, interactions, and sentiments. A quantitative research design was employed using a 5-point Likert-scale survey instrument adapted from Homans (1958), Studnicka (2023), and Bateman et al. (2002). Data were collected from 144 undergraduate students across science and social science disciplines in a public university in Malaysia. Descriptive and inferential statistical analyses were conducted using SPSS to examine students' perceptions and the relationships among the variables. The findings indicate that students demonstrate consistently high and positive perceptions across all three components. In particular, interaction elements such as team relationships, roles, and purpose and goals recorded strong agreement, suggesting effective collaboration and communication within groups. Significant relationships were also found among activities, interactions, and sentiments, supporting the interconnected structure proposed by Group Formation Theory. These results highlight that effective teamwork is shaped not only by task design but also by the quality of interaction and emotional experiences within the group. This study contributes to the existing literature by providing an integrated and theory-driven understanding of teamwork activity, demonstrating that activities, interactions, and sentiments function as a dynamic and interdependent system. The findings offer important implications for educators in designing structured and effective group-based learning environments in higher education.

Keywords: Teamwork activity, Group formation theory, Higher education, Group interaction, Student sentiment

INTRODUCTION

Background of Study

Teamwork has become a central pedagogical practice in higher education because it supports both academic learning and the development of transferable graduate attributes. In contemporary university settings, students are increasingly expected not only to master disciplinary knowledge but also to demonstrate communication, collaboration, problem-solving, adaptability, and leadership in team-based environments. Recent literature continues to position teamwork as a cornerstone of active learning because it can deepen understanding of course content, promote creativity, and prepare students for the collaborative demands of professional life (Francis et al., 2025; Poort et al., 2022). Likewise, cooperative and collaborative learning approaches have been associated with stronger academic performance, greater peer interaction, and the development of social and interpersonal skills that are essential for effective participation in group tasks (Lorente et al., 2024).

Despite these advantages, teamwork in higher education does not automatically produce positive learning experiences. The problem is not whether teamwork matters; it clearly does. The real issue is that team-based tasks often generate uneven participation, interpersonal conflict, low trust, dissatisfaction with assessment, and perceptions of unfairness, especially when group processes are poorly structured. Francis et al. (2025) argue that team-based activities are frequently disliked by students because of logistical difficulties, freeloading, weak scaffolding, and the assumption that students already know how to work effectively in teams. Similarly, Poort et al. (2022) show that student engagement in group work depends less on the mere existence of a group task and more on conditions within the group, particularly trust and the quality of interaction. These findings suggest that effective teamwork is shaped not only by the task itself but also by the social and structural conditions under which groups are formed and function.

This issue highlights the importance of effective group formation. Team formation is not a minor administrative step, but it is a critical process that influences communication, coordination, efficiency, and overall team success. A recent systematic literature review emphasizes that team formation is complex, time-consuming, and highly consequential because inappropriate team composition can discourage members and hinder learning outcomes (Stavrou et al., 2023). In higher education, this concern is reinforced by evidence that variations in methodology, team composition, role assignment, and student diversity can affect teamwork outcomes in meaningful ways. Lorente et al. (2024), for example, found that interdisciplinary learning environments showed promising effects for teamwork and cooperative learning outcomes, while also noting that challenges such as group formation, task design, and assessment complexity remain substantial barriers. Taken together, these studies indicate that successful teamwork depends not only on placing students into groups but also on understanding how group structures shape members' experiences and responses.

From a theoretical perspective, Homans's Group Formation Theory offers a useful lens for examining this issue because it explains group development through the dynamic relationship among activities, interactions, and sentiments. In this view, the tasks performed by members generate patterns of interaction, and repeated interactions gradually produce emotional responses such as satisfaction, confidence, commitment, and belonging. This study is grounded in Homans's (1958) Group Formation Theory, which explains group dynamics through the reciprocal relationship between activities, interactions, and sentiments, thereby offering a robust theoretical framework for analyzing teamwork activity in educational settings. Within this framework, group behaviour is understood as a dynamic process in which task-related activities shape interaction patterns, while repeated interactions influence members' sentiments such as satisfaction, confidence, and sense of belonging.

Accordingly, the present study is grounded in the view that teamwork activity in higher education should be examined not only as a teaching technique but as a social process shaped by what students do together, how they interact, and how they feel about those experiences. Although prior studies have established the benefits and challenges of teamwork, there remains a strong need to analyse students' perceptions of teamwork activity through an explicit group formation lens. By focusing on activities, interactions, and sentiments, this study seeks to provide a more structured understanding of how teamwork operates in higher education and why some collaborative learning experiences are more effective than others.

Statement of Problem

Although teamwork activities are widely implemented in higher education to enhance collaborative learning and develop essential graduate skills, their effectiveness remains inconsistent across different educational contexts. Prior studies have demonstrated that teamwork can improve academic performance, engagement, and interpersonal skills; however, these outcomes are not always achieved in practice due to issues such as unequal participation, lack of role clarity, ineffective communication, and interpersonal conflict among group members (Francis et al., 2025; Poort et al., 2022). These challenges indicate that the success of teamwork is not solely dependent on the activity itself but is strongly influenced by the underlying group dynamics.

One of the critical factors shaping these dynamics is group formation. The process of forming groups plays a significant role in determining how members interact, collaborate, and respond emotionally within a team. Nevertheless, in many educational settings, group formation is often conducted randomly or based on convenience, with limited consideration of theoretical principles or group composition strategies. Research has highlighted that inappropriate team formation can lead to reduced motivation, poor engagement, and suboptimal learning outcomes, despite the presence of structured collaborative tasks (Stavrou et al., 2023). This suggests a disconnect between the theoretical understanding of group formation and its practical implementation in educational environments.

Furthermore, existing literature tends to examine teamwork outcomes—such as performance, engagement, or satisfaction—without systematically analysing the underlying components that drive these outcomes. In particular, there is limited empirical investigation into how the interconnected elements of activities, interactions, and sentiments, as proposed by Homans's (1958) Group Formation Theory, collectively influence students' perceptions of teamwork. While previous studies have acknowledged the importance of interaction quality and emotional responses in group work, these factors are often examined in isolation rather than as part of an integrated theoretical framework.

Therefore, there is a need for a more structured and theory-driven examination of teamwork activities in higher education. Specifically, this study seeks to address the gap by analysing students' perceptions of teamwork through the lens of Group Formation Theory, focusing on the interplay between activities, interactions, and sentiments. By doing so, the study aims to provide a more comprehensive understanding of how group formation influences teamwork effectiveness and learning experiences in academic settings.

Objective of the Study and Research Questions

This study is done to explore teamwork activities through the lens of Homans's Group Formation Theory, focused on three core components: activities, interactions, and sentiments. Specifically, this study is done to answer the following questions;

How do learners perceive their interaction, sentiment and activities in group formation?
Is there a significant relationship between all factors in group formation?
Is there a significant difference in factors in group formation across?

LITERATURE REVIEW

Theoretical Framework of the Study

Homans's (1958) theory of Group Formation

The core elements of Homans' theory are activities, interactions, and sentiments. Activities denote the tasks or acts performed by group members, whether they are designated responsibilities or volunteer endeavours. Meanwhile, interactions include the communication and social interactions that develop among members throughout the execution of various tasks and activities. Furthermore, sentiments denote the emotional responses, attitudes, and feelings that arise among members due to their interactions and collective engagement in group activities. The three components are interconnected and provide the fundamental framework of social behaviour in small groups (Homans, 1958).

Teamwork Activity and Its Benefits

Teamwork activity is an important idea for understanding how people work together to achieve common objectives in a group. Across various organizational and educational contexts, effective collaboration requires the synchronised contributions of individuals who use their abilities, expertise, and experiences to accomplish tasks efficiently.

According to Mobolade, G. (2021) in the context of teamwork, when individuals engage in group activities, they inherently communicate, cooperate, and provide mutual feedback. Over the long haul, these interactions promote confidence, cooperation and mutual respect among members. This enhances teamwork since group members have a sense of belonging and dedication to the group's objectives. This theoretical framework underscores that successful collaboration depends not just on task completion but also on the quality of social relationships that emerge during group work.

Furthermore, collaborative activities often enhance overall productivity and group efficacy. When tasks are distributed among members according to their strengths and competencies, the group can complete complex tasks more efficiently than individuals working independently. This collaborative approach stimulates creativity and innovation, since members are more at ease in expressing novel ideas and critical criticism. Thus, collaboration not only improves job execution but also develops good group dynamics and organizational achievement.

This study's theoretical approach emphasises that collaboration is crucial for group formation and achievement. This research analyses how group activities, relationships, and feelings affect teamwork outcomes by adopting Homans' principles. Comprehending these linkages yields significant insights into how organised teamwork activities may augment cooperation, promote communication, and provide advantageous results for group members.

Past Studies on Teamwork Activity

Research on teamwork activity in higher education has consistently highlighted its role in enhancing academic performance, engagement, and the development of essential soft skills. Many studies have examined how collaborative and cooperative learning approaches influence students' interaction, participation, and learning outcomes. The study by Lorente et al. (2024) was conducted to investigate the effectiveness of cooperative, collaborative, and interdisciplinary learning approaches in higher education. The research involved 229 undergraduate students from various disciplines in Spanish universities, using two structured questionnaires to measure cooperative learning and teamwork outcomes. The findings revealed that interdisciplinary learning approaches significantly improved students' perceived ability to work in groups and enhanced cooperative learning outcomes, particularly among certain disciplines. The study implies that structured and well-designed collaborative learning environments can significantly improve teamwork effectiveness and student performance.

Similarly, the study by Chimruang and Yampinij (2021) examined the implementation of constructionist learning using teamwork and social networks in higher education. The study involved 46 first-year information technology students and employed pre-test and post-test assessments alongside satisfaction surveys. The results showed that students' post-test scores were significantly higher, and their satisfaction with teamwork activities was positive. The findings suggest that integrating teamwork with structured theoretical models and digital platforms enhances student engagement, learning outcomes, and collaborative skills. In another study, Chaudhry et al. (2024) investigated the relationship between internal team environment, institutional support, and students' psychological well-being. The study involved 309 management students and used structural equation modelling and regression analysis based on survey data. The findings indicated that a positive internal team environment significantly enhances students' academic engagement and psychological well-being, with engagement acting as a mediating factor. The study implies that effective teamwork environments contribute not only to academic outcomes but also to students' emotional and psychological development.

The study by Poort et al. (2022) was conducted to examine the effects of trust, cultural diversity, and group formation on student engagement in group work. The research involved a large sample of 1025 undergraduate students from multiple universities and utilised questionnaire-based data that was analysed using structural equation modelling. The findings showed that trust within the group was the strongest predictor of both behavioural and cognitive engagement, while cultural diversity and group formation had comparatively smaller effects. The study suggests that interaction quality plays a more critical role than group composition alone in determining teamwork effectiveness.

In the Malaysian context, recent studies have further reinforced the importance of collaborative and teamwork-based learning in higher education, particularly in enhancing engagement, interaction, and higher-order thinking skills. Awang-Hashim et al. (2023) conducted a study to investigate the underlying factors that contribute to effective collaborative learning in tertiary classrooms. The research involved university students in Malaysia and utilised a survey-based approach grounded in the presage–process–product (3P) model to examine teaching quality, student interaction, and learning outcomes. The findings revealed that collaborative learning significantly contributes to reflective learning, integrative learning, and higher-order thinking, particularly when supported by strong student–faculty interaction and quality teaching practices. The study implies that the effectiveness of teamwork is highly dependent on interaction quality and the learning environment rather than merely the presence of group activities. Similarly, the study by Leow and Neo (2023) investigated collaborative learning experiences in a Malaysian university using a mixed-method design involving approximately 300 students and multiple instruments, including surveys, interviews, and online interactions. The findings indicated that collaborative learning environments enhance students' engagement, communication, and knowledge-sharing processes, particularly when supported by structured learning design and technology integration. However, the study also highlighted challenges related to insufficient theoretical grounding and ineffective implementation of collaborative activities. The implication is that while collaborative learning is beneficial, its effectiveness depends on well-designed frameworks that guide student interaction and participation.

In addition, Abuhassna et al. (2023) examined the antecedents and consequences of collaborative learning among Malaysian university students using a quantitative research design with survey instruments. The study found that collaborative learning significantly influences students' academic achievement, autonomy, and satisfaction, particularly in online learning environments. These findings suggest that teamwork activities play a critical role in shaping both cognitive and motivational outcomes, especially in technology-mediated learning contexts. Furthermore, Chang (2023) explored the relationship between lecturers' pedagogical approaches and students' group-based learning in a Malaysian higher education institution through a qualitative study involving 12 lecturers using semi-structured interviews. The findings revealed that effective collaborative learning requires not only student participation but also strong instructional design and lecturer facilitation. The study implies that the success of teamwork activities is influenced by both structural (teaching approach) and social (interaction) factors, emphasizing that there must be alignment between pedagogy and group-based learning strategies.

Overall, existing studies demonstrate that teamwork activities can significantly enhance learning outcomes, engagement, and skill development in higher education. However, these benefits are highly dependent on factors such as group dynamics, interaction quality, and team formation strategies. While previous research has examined these aspects individually, there remains limited empirical work that integrates these elements within a single theoretical framework. In particular, the interconnected roles of activities, interactions, and sentiments, as proposed by Group Formation Theory, have not been systematically examined. Therefore, this study aims to address this gap by providing a comprehensive and theory-driven analysis of teamwork activity in higher education.

Conceptual Framework of the Study

Figure 1 presents the conceptual framework of the study. Homan's (1958) theory of group formation is used to anchor this study. The main components of this study are merged with the factors in the instrument for students' satisfaction and self-confidence by Studnicka (2023) and group work by Bateman et. al (2002). Homans' theory of group formation explains that groups emerge and develop through the dynamic interplay of activities**,** interactions, and sentiments**.** First, activities and tasks people perform together shape a group when members engage in work that aligns with their passion, commitment, skills, and opportunities for learning, motivating them to coordinate and depend on one another. Second, interactions arise from these shared activities and help define the group's purpose and goals**,** strengthen team processes**,** build team relationships**,** and influence intergroup relations, ultimately creating the social structure that guides how members communicate and collaborate (Rahmat, 2020). Finally, sentiments, which grow from continued interactions,

reflect the members' emotional responses, shaping their satisfaction, sense of belonging, and self-confidence, and reinforcing their willingness to remain part of the group.

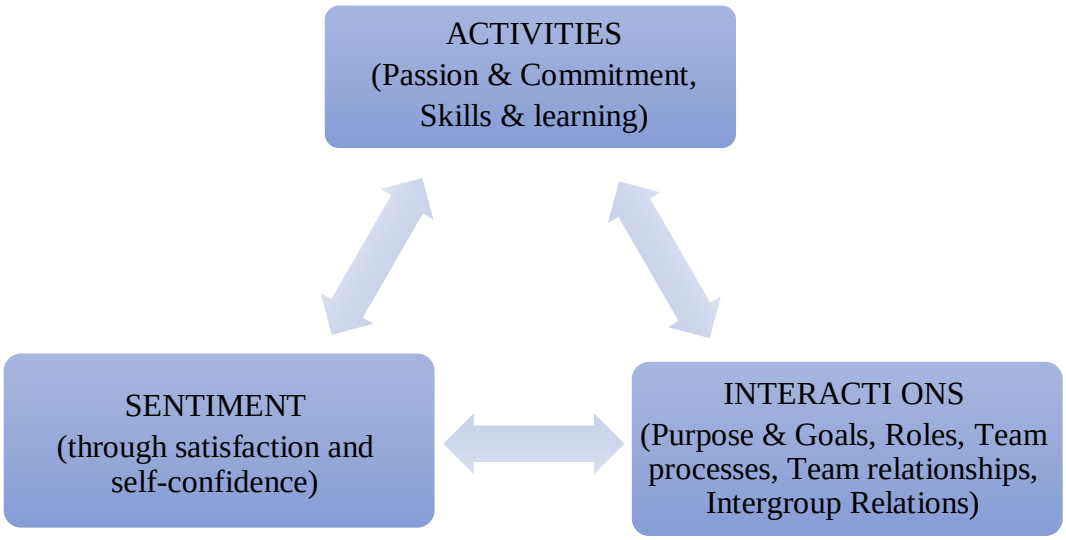


Figure 1. Conceptual Framework of the Study.

Teamwork activity through group formation theory

METHODOLOGY

This quantitative study is done to explore students' perception on teamwork. A convenient sample of 144 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted from Homans (1958), Studnicka (2023) and Bateman et.al. (2002) to reveal the variables in Table 3 below. Table 1 below shows the categories used for the Likert scale; 1 is for Strongly Disagree, 2 is for Disagree, 3 is for Undecided, 4 is for Agree and 5 is for Strongly Agree.

Table 1. Likert Scale Use

1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Table 2. Distribution of Items in the Survey

Section	Variable	Variable	Construct	Item		Cronbach Alpha
B	Sentiments	Student Satisfaction and Self-Confidence In Learning Studnicka (2023)	Satisfaction with Current Learning	5	13	.971
			Self-Confidence in Learning	8		
C	Interactions	Group work Bateman, et.al. (2002)	Purpose and Goals (PG)	3	16	.980
			Roles (R)	3		
			Team Processes (TP)	3		
			Team Relationships (TR)	4		
			Intergroup Relations (IR)	3		
D	Activities		Passion and Commitment	3	6	.955

		(PC)			
		Skills and Learning (SL)	3		
				35	.989

Table 2 shows the distribution of items in the survey. Section B has 13 items on Sentiments, Section C has 16 items on interactions, and section D has 16 items on activities.

Table 3. Reliability Levels, Cronbach's Alpha Ranges, and Their Interpretations

Reliability Level	Cronbach's Alpha range	Interpretation
Excellent	0.9 and above	Indicates very high internal consistency
Good	0.80-0.89	Reflects strong internal consistency
Acceptable	0.70-0.79	Indicates acceptable internal consistency
Questionable	0.60-0.69	Reflects questionable internal consistency
Poor	Below 0.6	Indicates poor internal consistency

In order to determine the internal reliability of the instrument, reliability analysis is one. Table 3 above shows the distribution and interpretation of Cronbach Alpha range. According to Ahmad,et.al. (2024), Cronbach Alpha scores between 0.7 to 0.9 is considered acceptable to excellent. Table 2 also shows the reliability of the survey. The analysis shows a Cronbach alpha of .971 for sentiments, .980 for interactions, and .955 for activities. The total Cronbach's alpha for all 35 items is .989; thus, revealing a good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

FINDINGS

Demographic Analysis

According to Zienefuss et.al (2021), researchers report demographic data in percentages to establish sample representatives, and allow for generalizability to a larger population. The reporting also provides an overview of participants' characteristics. Percentages offer a clear and understandable picture of the sample makeup.

Table 4. Percentage for Demographic Profile

Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	73%
		Female	27%
3	Cluster	Science & Technology	76%
		Social Sciences & Humanities	24%

Table 4 indicates the percentage for demographic profile of the participants where 73% of male and 27% of female were involved in this study. Among these data collected, 76% was from the background of science and technology and the remaining percentage was from the cluster of social sciences and humanities.

Descriptive Statistics

Why is there a need to report the mean and standard deviation? According to Vetter (2017), Mean (M) represents the average, or centre of a data set. Standard deviation (SD) indicates the typical distance of individual observations from the mean which shows the data's variability or spread. A low SD means the data points are clustered close to the mean whole a high. SD indicates they are more spread out. It is good to have a high SD.

Findings for Activities

This section presents data to answer research question 1- How do learners perceive activities in group formation? In the context of this study, this is measured by (i) passion and commitment (PC), and (ii) skills and learning (SL)

Table 5. Mean and Standard Deviation for Passion and Commitment (PC)

Item	Mean	SD
PCQ1 Working on our team inspires people to do their best.	4.3	0.79
PCQ2 People are proud to be part of our team.	4.28	0.80
PCQ3 My team is proud of its accomplishments and optimistic about our work.	4.35	0.80

Table 5 demonstrates the mean and standard deviation for passion and commitment (PC) of the participants involved regarding teamwork. Response rates were recorded on a 5-point scale, where 1 = strongly disagree, and 5 = strongly agree. PCQ3 shows the highest mean value which is 4.35, with PCQ1 comes in second and then PCQ2. For the standard deviation, PCQ2 and PCQ3 give the same value which is 0.80 followed by PCQ1 (SD = 0.79).

Table 6. Mean and Standard Deviation for Skills and Learning (SL)

Item	Mean	SD
SLQ1 We have the skills we need to do our jobs effectively.	4.31	0.77
SLQ2 We view everything, even mistakes, as opportunities for learning and growth	4.33	0.78
SLQ3 Team members embrace continuous improvement as a way of life.	4.31	0.80

Referring to Table 6, assigned to the mean and standard deviation for skills and learning (SL), SLQ2 shows the highest mean value (mean = 4.33) whereas SLQ1 and SLQ3 give the same value for mean (mean = 4.31). This displays that the participants understand that mistakes can be viewed as an opportunity to grow and learn. As for the standard deviation, SLQ3 gives the highest value followed by SLQ2 and SLQ1.

Findings for Interaction

This section presents data to answer research question 2- How do learners perceive their interaction in group formation? In the context of this study, this is measured by (i) purpose and goals (PG), (ii) roles, (iii) team processes (TP), (iv) team relationships (TR) and (v) intergroup relations (IR).

Table 7. Mean and Standard Deviation for Purpose and Goals (PG)

Item	Mean	SD
PGQ1 Our team has a meaningful, shared purpose.	4.31	0.79
PGQ2 We are strongly committed to a shared mission.	4.32	0.78
PGQ3 We set and meet challenging goals.	4.34	0.79

Table 7 presents the mean and standard deviation for the purpose and goals (PG) dimension of interaction in group formation. Overall, the findings indicate that respondents demonstrate a strong alignment with shared purpose and collective goals, as reflected by consistently high mean scores across all items ($M \geq 4.31$). Among the items, PGQ3 recorded the highest mean ($M = 4.34$), suggesting that students perceive their teams as capable of setting and achieving challenging goals. This is followed closely by PGQ2 ($M = 4.32$), indicating a strong commitment to a shared mission, and PGQ1 ($M = 4.31$), reflecting a meaningful and unified team purpose. The relatively low standard deviation values ($SD \approx 0.78–0.79$) indicate consistency in responses among participants. These findings support Homans's (1958) Group Formation Theory, which posits that shared activities and clearly defined goals play a crucial role in shaping interaction patterns within a group. When members are aligned toward common objectives, interactions become more structured, purposeful, and collaborative. This is further supported by previous studies, which highlight that goal clarity and shared purpose enhance coordination, engagement, and overall team effectiveness (Poort et al., 2022; Lorente et al.,

2024). Therefore, the strong agreement observed in this dimension suggests that clearly defined goals and shared commitment are key drivers of effective interaction in teamwork settings.

Table 8. Mean and Standard Deviation for Roles (R)

Item	Mean	SD
RQ1 Team members clearly understand their roles.	4.30	0.83
RQ2 When an individual's role changes, an intentional effort is made to clarify it for everyone on the team.	4.25	0.77
RQ3 Everyone values what each member contributes to the team	4.31	0.82

Table 8 presents the mean and standard deviation for the roles (R) dimension of interaction in group formation. The findings indicate that respondents generally have a clear understanding of their roles within the team, as reflected by high mean scores across all items ($M \geq 4.25$). Among the items, RQ3 recorded the highest mean ($M = 4.31$), suggesting that students perceive a strong sense of appreciation for each member's contribution, which reflects positive team recognition and inclusivity. This is followed by RQ1 ($M = 4.30$), indicating that team members clearly understand their assigned roles. Meanwhile, RQ2 recorded a slightly lower mean ($M = 4.25$), suggesting that while role clarification occurs when changes arise, it may not always be consistently implemented. The standard deviation values ($SD \approx 0.77–0.83$) indicate moderate consistency in responses among participants. These findings support Homans's (1958) Group Formation Theory, which emphasises that structured activities and defined responsibilities contribute to more effective interaction patterns within groups. Clear role allocation reduces ambiguity and enhances coordination, allowing members to engage more productively in collaborative tasks. This is consistent with previous studies that highlight the importance of role clarity in improving teamwork effectiveness and reducing conflict among members (Poort et al., 2022; Francis et al., 2025). Therefore, the findings suggest that clearly defined and mutually recognized roles play a critical role in strengthening interaction quality and overall team performance.

Table 9. Mean and Standard Deviation for Team Processes (TP)

Item	Mean	SD
TPQ1 We address and resolve issues quickly.	4.21	0.80
TPQ2 Our team works with a great deal of flexibility so that we can adapt to changing needs.	4.26	0.80
TPQ3 When we choose consensus decision-making, we do it effectively.	4.30	0.75

Table 9 presents the mean and standard deviation for the team processes (TP) dimension of interaction in group formation. The findings indicate that respondents generally perceive team processes to be effective, with all items recording relatively high mean scores ($M \geq 4.21$). Among the items, TPQ3 recorded the highest mean ($M = 4.30$), suggesting that students perceive consensus decision-making within their teams to be effective. This is followed by TPQ2 ($M = 4.26$), indicating that teams demonstrate flexibility in adapting to changing needs, while TPQ1 recorded the lowest mean ($M = 4.21$), suggesting that issue resolution, although positive, may be slightly less efficient compared to other aspects of team processes. The standard deviation values ($SD \approx 0.75–0.80$) indicate consistent responses among participants. From a theoretical perspective, these findings align with Homans's (1958) Group Formation Theory, which posits that repeated interactions during group activities shape the structure and effectiveness of team processes. Efficient decision-making, adaptability, and problem resolution are outcomes of well-established interaction patterns within the group. These results are consistent with previous studies that emphasise the role of structured team processes in enhancing collaboration, flexibility, and overall team effectiveness (Lorente et al., 2024; Francis et al., 2025). Therefore, the findings suggest that effective team processes are essential in facilitating smooth interaction and maintaining group performance in teamwork settings.

Table 10. Mean and Standard Deviation for Team Relationships (TR)

Item	Mean	SD
TRQ1 Team members appreciate one another's unique capabilities.	4.28	0.79

TRQ2 Team members are effective listeners.	4.30	0.79
TRQ3 Communication in our group is open and honest.	4.35	0.77
TRQ4 Members of our team trust each other.	4.44	0.82

Table 10 presents the mean and standard deviation for the team relationships (TR) dimension of interaction in group formation. The findings indicate that respondents perceive team relationships to be highly positive, as reflected by consistently high mean scores across all items ($M \geq 4.28$). Among the items, TRQ4 recorded the highest mean ($M = 4.44$), suggesting a strong level of trust among team members, which is a key indicator of effective interpersonal relationships. This is followed by TRQ3 ($M = 4.35$), indicating that communication within the group is open and honest, while TRQ2 ($M = 4.30$) reflects effective listening among members. TRQ1 recorded the lowest mean ($M = 4.28$), although still high, indicating that members appreciate each other's unique capabilities. The standard deviation values ($SD \approx 0.77–0.82$) suggest relatively consistent perceptions among respondents. These findings are consistent with prior research highlighting that trust and open communication are critical predictors of effective teamwork and student engagement (Poort et al., 2022; Chaudhry et al., 2024). Therefore, the results suggest that strong interpersonal relationships within teams play a vital role in enhancing interaction quality and sustaining effective collaboration in group-based learning environments.

Table 11. Mean and Standard Deviation for Intergroup Relations (IR)

Item	Mean	SD
IRQ1 We are able to resolve conflicts with other teams collaboratively.	4.30	0.79
IRQ2 We communicate effectively with other groups.	4.35	0.71
IRQ3 Our collaborations with other teams are productive, worthwhile, and yield good results.	4.35	0.80

Table 11 presents the mean and standard deviation for the intergroup relations (IR) dimension of interaction in group formation. The findings indicate that respondents generally perceive intergroup relations to be positive, as reflected by consistently high mean scores across all items ($M \geq 4.30$). Among the items, IRQ2 and IRQ3 recorded the highest mean ($M = 4.35$), suggesting that students perceive effective communication with other groups and view intergroup collaborations as productive and beneficial. IRQ1 recorded a slightly lower mean ($M = 4.30$), indicating that while students are able to resolve conflicts collaboratively with other teams, this aspect may be comparatively less emphasized than communication and collaborative outcomes. The standard deviation values ($SD \approx 0.71–0.80$) indicate relatively consistent responses among participants. From a theoretical perspective, these findings are consistent with Homans's (1958) Group Formation Theory, which suggests that interaction patterns extend beyond intra-group dynamics to include intergroup relationships that shape broader social structures within a learning environment. Positive intergroup interaction facilitates knowledge exchange, enhances collective problem-solving, and promotes a more collaborative academic culture. These findings are supported by previous studies which highlight that effective communication and collaboration across groups contribute to improved learning outcomes and engagement (Lorente et al., 2024; Poort et al., 2022). Therefore, the results suggest that strong intergroup relations play an important role in reinforcing teamwork effectiveness and enriching collaborative learning experiences.

Findings for Sentiment

This section presents data to answer research question 3- How do learners perceive their sentiment in group formation? In the context of this study, this refers to students' (i) satisfaction and (ii) self-confidence.

Table 12. Mean and Standard Deviation for Satisfaction with Current Learning (CL)

Item	Mean	SD
CLQ1 The methods used in this role play /activity were supportive and effective	4.19	0.82
CLQ2 The role play /activity provided me with a variety of educational materials and activities to promote my learning.	4.25	0.78
CLQ3 I liked the way my instructor taught me the role play /activity	4.33	0.85

CLQ4 The teaching materials used in this role play /activity were motivating and helped me learn.	4.23	0.85
CLQ5 The way my instructor taught the role play /activity was appropriate to my way of learning.	4.25	0.83

With reference to Table 12 - mean and standard deviation for satisfaction with current learning (CL), item CLQ3 gives the highest mean value which is 4.33 and followed by items CLQ5 and CLQ2 (i.e., mean value = 4.25). The lowest mean value is referring to item CLQ1 with 4.19.

Table 13. Mean and Standard Deviation for Self-Confidence in Learning (L)

Item	Mean	SD
LQ1 I am confident that I am mastering the class role-play/activity presented to me by my instructors.	3.89	0.82
LQ2 I am confident that this role-play/activity covered the essential content necessary to master the material covered in the curriculum.	4.06	0.80
LQ3 I am confident that I am developing the skills and gaining the required knowledge from this role-play/activity to perform the necessary tasks in my course	4.15	0.83
LQ4 My instructors used a variety of helpful resources to teach this role-play/activity	4.19	0.85
LQ5 It is my responsibility as a student to learn what I need during role-play /activity classes.	4.32	0.81
LQ6 I know how to get help when I do not understand the concepts in the role-play/activity.	4.20	0.76
LQ7 I know how to use role play exercises to learn the critical/key aspects of this course.	4.13	0.79
LQ8 It is the instructor's responsibility to show me what I need to learn during the role-play /activity class.	4.24	0.81

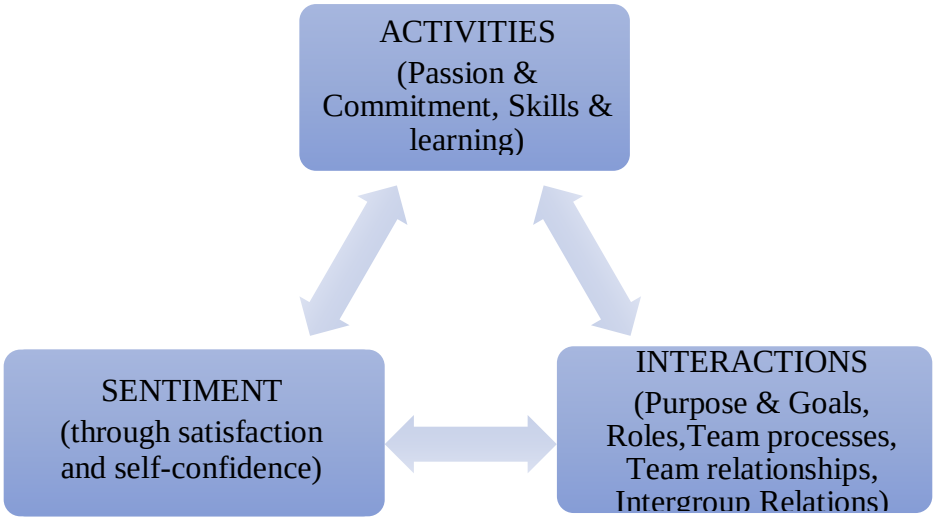
With reference to Table 13 - mean and standard deviation for self-confidence in learning (L), item LQ5 which is the responsibility of the respondents to acquire the necessary knowledge during the role-playing sessions and activities gives the highest mean value which is 4.32 and followed by item LQ8 which is the instructor's responsibility to show respondents what to learn during the role-play or activities in class) with mean value = 4.24. The lowest mean value is 4.19 referring to item LQ1 which the respondents are confident and mastering the role-play or activity that the instructors presented to them.

Exploratory Statistics

According to He (2024), correlation is a statistical technique that shows how strongly two variables are related to each other or the degree of association between the two. It's a common tool for describing simple relationships without making a statement about cause and effect. This section presents data to answer research questions on correlation.

Findings for the Relationship between all factors in group formation

This section presents data to answer research question 4- Is there a significant relationship between all factors in group formation?



To determine if there is a significant association in the mean scores between all factors in group formation, data is analyzed using SPSS for correlations. Results are presented separately in Table 14, 15 and 16 below.

Table 14. Correlation between Activities and Interactions Components

		Activities	Interactions
Activities	Pearson (Correlation	1	.950**
	Sig (2-tailed)		<.001
	N	144	144
Interactions	Pearson (Correlation	.950**	1
	Sig (2-tailed)	.<.001	
	N	144	144

**Correlation is significant at the 0.01 level (2-tailed)

Table 14 shows that there is an association between activities and interaction components. Correlation analysis shows that there is a highly significant association between activities and interactions (r=.950**) and (p=.000). According to He (2024), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between activities and interactions.

Table 15. Correlation Between Interaction and Sentiment

		Interaction	Sentiments
Interaction	Pearson (Correlation	1	.891**
	Sig (2-tailed)		<.001
	N	144	144
Sentiments	Pearson (Correlation	.891**	1
	Sig (2-tailed)	<.001	
	N	144	144

**Correlation is significant at the 0.01 level (2-tailed)

Table 15 shows that there is an association between interaction and sentiment. Correlation analysis shows that there is a highly significant association between interaction and sentiment (r=.950**) and (p=.000). According to He (2024), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between interaction and sentiment.

Table 16. Correlation Between Sentiment and Activities

		Sentiments	activities
Sentiments	Pearson (Correlation	1	.895**
	Sig (2-tailed)		<.001
	N	144	144
activities	Pearson (Correlation	.891**	1
	Sig (2-tailed)	.<.001	
	N	144	144

**Correlation is significant at the 0.01 level (2-tailed)

Table 16 shows that there is an association between sentiment and activities. Correlation analysis shows that there is a highly significant association between sentiment and activities (r=.895**) and (p=.000). According to He (2024), the coefficient is significant at the .05 level, and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between sentiment and activities

CONCLUSION

Summary of Findings and Discussions

This study examined students' perceptions of teamwork activity in higher education through the lens of Homans's (1958) Group Formation Theory, focusing on the interconnected roles of activities, interactions, and sentiments. Overall, the findings demonstrate that all three components contribute significantly to shaping effective teamwork experiences among undergraduate students.

According to the first research question, the findings indicate that students exhibit high levels of passion, commitment, and engagement in teamwork activities. Participants demonstrated strong confidence in their abilities and a positive orientation toward continuous learning and improvement. The highest responses were associated with shared accomplishments and collective pride, highlighting the importance of group success in strengthening team commitment. These findings align with Chaudhry et al. (2024), who emphasised that effective teamwork environments contribute not only to academic outcomes but also to students' psychological development. Regarding the second research question, the findings reveal that interaction plays a central role in determining teamwork effectiveness. High levels of agreement were observed across purpose and goals, roles, team processes, team relationships, and intergroup relations. In particular, trust, communication, and shared commitment emerged as key drivers of effective collaboration. These findings are consistent with Poort et al. (2022) and Lorente et al. (2024), who identified interaction quality and goal alignment as critical factors influencing engagement and teamwork outcomes. Furthermore, the presence of clearly defined roles and structured team processes supports effective coordination and reduces ambiguity, reinforcing findings reported by Francis et al. (2025).

In relation to the third research question, the results indicate that students demonstrate high levels of satisfaction and self-confidence in learning through teamwork activities. The strong alignment between lecturer support and students' responsibility for their own learning suggests that both instructional design and learner autonomy contribute to positive sentiment outcomes. These findings are consistent with Chang (2023), who highlighted the importance of pedagogical approaches and student participation in enhancing collaborative learning effectiveness. In addressing the fourth research question, the analysis revealed strong and statistically significant relationships among activities, interactions, and sentiments. The strongest relationship was observed between activities and interactions, followed by interactions and sentiments, and sentiments and activities. These findings provide empirical support for Homans's (1958) Group Formation Theory, confirming that group behaviour is shaped through a dynamic and reciprocal process in which activities influence interactions, and interactions subsequently shape sentiments.

Overall, this study contributes to the existing literature by providing a theory-driven understanding of teamwork activity in higher education. Unlike previous studies that examine teamwork outcomes in isolation, this study demonstrates that activities, interactions, and sentiments function as an integrated system. This highlights the importance of adopting a holistic approach in designing and managing teamwork activities to enhance both learning outcomes and student experiences.

Implications and Suggestions for Future Research

Theoretical and Conceptual Implications

The findings support the theoretical importance in understanding how group processes evolve and impact learning outcomes, emphasizing the need for educators to facilitate these stages which are forming, storming, norming and performing dynamically (Mahat et al., 2024). Besides, the synthesis of these results underscores the continued applicability of Homans's (1958) group formation theory, particularly through the emphasis on socio-psychological factors like trust, emotional states, and psychological safety in determining student engagement and the success of collaborative efforts. These observations correspond with modern socio-emotional models that identify psychological safety and mutual trust within a team as vital prerequisites for high-functioning teamwork (Kerr et al., 2024). Evidence from the literature review matches the basic premise that team success is dictated solely by group composition. Instead, it indicates that fluid processes which incorporate persistent feedback and strategic restructuring are vital for maximizing students' involvement and competence. These findings advocate for a transition toward adaptive group formation frameworks that prioritize ongoing evaluation and flexibility (Garshasbi et al., 2023; Begibaevna et al., 2024). Furthermore, broadening the traditional input-process-output models, the inclusion of personality traits and affective elements in group formation algorithms highlights the role of individual differences in driving open communication and team satisfaction. This conceptual development emphasizes that group dynamics are shaped by complex factors extending far beyond mere cognitive abilities and technical skills (Revelo et al., 2021).

Pedagogical Implications

To optimize the quality of collaboration and reduce obstructive group behaviors, pedagogical frameworks should incorporate socio-emotional support, specifically by cultivating an atmosphere of trust and psychological safety within student teams (Kerr et al., 2024). Engagement is consistently linked to group formation strategy, with deliberate and AI-assisted groupings enhancing participation, motivation, and satisfaction. To foster continuous student interest and proficiency throughout a course, it is recommended that educators implement flexible, AI-enhanced group organization methods that utilize ongoing input and permit the restructuring of teams (Garshasbi et al., 2023). Institutions should adopt technology-driven tools that ensure group formation is both inclusive and equitable in order to implement diversity and support underrepresented students. These tools help promote a diverse learning environment while maintaining necessary group cohesion and positive educational results. To complement various group formation techniques and facilitate effective collaboration, it is critical to provide students with training and scaffolding in teamwork competencies, such as communication, role distribution, and conflict resolution to enhance their self confidence as well (Jain et al., 2024). Educators and practitioners ought to customize group composition methods to align with particular learning objectives and student demographics. By effectively balancing member diversity with interpersonal compatibility, they can optimize student engagement and facilitate the more successful acquisition of collaborative competencies.

Suggestions for Future Research

Drawing upon Homans's (1958) framework, the broad spectrum of research concerning the pedagogical effects of teamwork emphasizes that intentional group formation is vital for boosting student involvement and the cultivation of skills within higher education environments. Develop longitudinal experimental research that focuses on measuring and adjusting the various phases of Homans' group formation to determine their specific impact on teamwork abilities and student participation. Future studies should focus on the creation and

evaluation of group formation frameworks that deliberately integrate considerations for social anxiety and inclusive diversity. Such research is necessary to determine their influence on student engagement levels and the promotion of balanced skill acquisition (Zolyomi and Nguyen, 2025). It is also recommended to emphasize on the implementation and longitudinal evaluation of structured teamwork training programs. These initiatives, rooted in group formation theory, should specifically measure how effectively collaborative skills are transferred to professional environments. Group teamwork outcomes are heavily influenced by internal social and psychological processes. Cohesion and personal learning are deeply shaped by factors such as trust, motivation, emotional states, and feelings of inclusion. However, the lack of real-time, process-driven data on these dynamics often hinders the development of precise pedagogical strategies for improving conflict resolution and psychological safety. While structured training and iterative models have demonstrated potential for building transferable skills, there remains a critical need for future studies to address scalability and provide longitudinal validation.

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