From Forming to Performing: Investigating Tuckman's Model Across Academic Disciplines in Higher Education

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ABSTRACT

Collaborative learning or group work is a fundamental pedagogical approach that promotes higher-order thinking skills while fostering active engagement among students. The ability to work effectively in collaborative settings is significant for students' success, impacting not only academic achievement but also professional capabilities. Tuckman's model, consisting of four key stages of group development, was implemented to investigate group dynamics among ESL learners when performing a discussion observation assessment. The data of this study were gathered from 53 students who participated in one communication course in UiTM Cawangan Kelantan, Machang Campus. This qualitative study used an online questionnaire adapted from Tuckman's Teamwork Survey (2016). It was revealed that the students were progressing linearly through the four stages: forming, storming, norming and performing, wherein the final stage demonstrated a high level of collaborative work. The study also found that there was a significant difference between ESL learners' academic disciplines and one of the stages in group development, particularly during the performing stage. Apparently, these findings highlight the importance of targeted support, systematic guidance, and meticulously designed group tasks to ensure productive collaboration among the team members.

Keywords: collaborative learning, group work, stages of group development, Tuckman's model

INTRODUCTION

Group-based learning, also known as group work, has long served as a fundamental pedagogical approach. Generally, it aims at fostering active engagement among students, with more specific objectives focusing on developing essential skills in managing group projects, performing the assigned tasks and effectively negotiating with others. At the university level, students who excel in collaborative settings are said to achieve academic success, and expectantly, they are prepared for future professional challenges (Rister & Bourdeau, 2021). Additionally, the implementation of group work in educational institutions is directly responded to the Malaysian Education Blueprint (Higher Education) 2015-2025 which urges universities to transcend traditional academic knowledge by encouraging higher-order thinking skills as collaborative problem-solving, alongside essential soft skills, which emphasizes communication, teamwork, moral and professional ethics as its primary outcomes (Ministry of Education Malaysia, 2015).

Collaborative projects have benefited students in multiple dimensions. Research proves that students are able to function cognitively, socially and professionally across various educational contexts (Sofroniou & Poutos, 2016). Interestingly, Nieswandt et al. (2020) in their study on a triple problem-solving space involving students working in small groups (3-4 members) found that the groups engaged effectively in the cognitive aspects of the assigned tasks when they collectively positioned themselves in social and affective dynamics, developed on a moment-by-moment basis. This, therefore, indicates that group work functions as a powerful pedagogical approach that enables students to excel academically and thrive socially.

Despite the widely acknowledged benefits of group work, the process of achieving cohesion and productivity remains a significant challenge. Cohesion, according to Rojo-Ramos et al. (2024), is an important factor which decides whether the group will succeed or fail to achieve its goals. Lack of understanding of each member's

roles when completing a task could be the obstacle for the group to progress, hence low cohesion group would form. As highlighted in one of the most recognized frameworks for understanding group work, Tuckman's (1965) model, it requires a group to complete each stage before advancing to the next so as to face the process of planning tasks, resolving conflicts and delivering outcomes. Failure to achieve cohesion at the initial stage of group development would significantly affect the group goal-setting process and its overall performance (Zamecnik et al., 2024).

A very limited body of literature discussing different academic disciplines, most of which focus on a single discipline batch of students as studied in Jones (2019) and Hassanien (2006). This research adds to the body of literature examining how groups of students from social sciences and science and technology fields progressed through Tuckman's group dynamics. It is deemed significant to explore this discipline-specific difference as students may place varying degrees of importance on different types of learning activities and resources. This is pertinent, as revealed by Lim and Richardson (2022) that social presence was perceived differently according to the students' academic areas despite the same degree of importance placed on the teaching presence components.

The significant findings from the study help in designing a more inclusive approach in collaborative tasks that also account for interdisciplinary classes and simultaneously help instructors provide ample support in those stages of group work, particularly in conflict-prone ones.

Objectives of the Study

This study aims to investigate group dynamics among ESL learners participating in a discussion observation assessment based on Tuckman's model of group development. Specifically, it proposes two research questions to be addressed as follows:

- How does Tuckman's model of group development influence ESL learners in the discussion observation assessment?
- Are there any significant differences between the stages in group development and the ESL learners' academic disciplines?

LITERATURE REVIEW

Tuckman (1965) Stages in Group Work

Group work in higher education is increasingly used as a pedagogical strategy to enhance both cognitive learning and social interaction skills. With the growing trend of integrating technology and collaborative tasks, students frequently engage in short-term, task-oriented academic groups designed to complete assignments, projects, or problem-based learning activities within limited timeframes. These groups are different in structure and function: they are temporary, diverse, and have a goal-driven standpoint rather than long-term organizational ones ingrained in corporate teams. Therefore, understanding the dynamics of these academic groups requires a theoretical framework that explains how students interact, negotiate roles, and achieve task objectives efficiently.

Tuckman's (1965) model of group development—comprising forming, storming, norming, and performing—offers a functional perspective for analyzing how such groups of students contribute to multifaceted group dynamics. In the forming stage, members establish relationships, clarify objectives, and develop an initial understanding of their roles. During storming, students encounter differences in working styles, opinions, or leadership preferences, which often lead to negotiation and potential conflict. As they progress into norming, the group establishes trust, sets collective expectations, and develops cohesion. Finally, the performing stage is characterized by effective collaboration and shared problem-solving, enabling students to achieve task outcomes efficiently. While extensively applied in corporate and organizational contexts, the use of Tuckman's framework in academic settings—particularly short-term group tasks—remains underexplored, indispensably creating a research gap.

Group Dynamics in Academic Context

Recent studies validate the relevance of Tuckman's model in educational contexts. Wan Yadri et al. (2024)

examined 178 Malaysian foundation students involved in collaborative assignments and found that each stage of Tuckman's model significantly influenced group performance. The study highlighted that leadership clarity was critical during storming, while trust and communication were essential during norming, ultimately enhancing cohesion and productivity during performing. Similarly, Zulkifli et al. (2022) surveyed 255 undergraduates across multiple disciplines and reported strong intercorrelations among all stages, concluding that structured guidance during forming and storming accelerated students' transition to effective teamwork. Their findings underscore that even in temporary, task-driven academic groups, the progression through Tuckman's stages remains a consistent predictor of group work success.

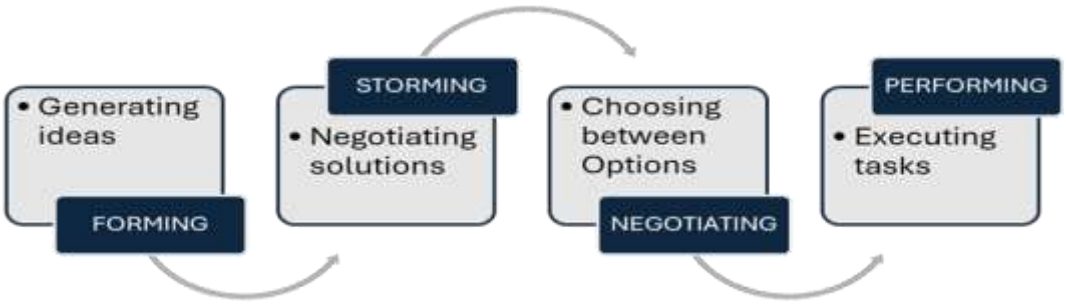
Another impactful study by Jones (2019) investigated first-year engineering multicultural students' group dynamics using Tuckman's stages. The method used was class-based negotiation role plays, and it was found that all stages are relevant except for the adjourning stage, which is less applicable in the classroom contexts, unlike in corporate ones. The study shed some light on the model's usefulness in monitoring students' progress, demonstrated through problem-solving, critical thinking, adaptability, and leadership skills, particularly in multicultural environments. In contrast, Hassanien (2006) used a mixed methods study among final year tourism and hospitality students in the UK, which emphasizes their perceptions towards group work and assessment. The findings echo with Zulkifli et al. (2022) as the students value group work for establishing teamwork with clear leadership and sound communication skills. It was also found that group work instinctively enhances learning by promoting the exchange of ideas, encouraging clarification, and enabling the evaluation of different perspectives. Although both studies use the same model highlighting the benefits of culturally diverse teamwork, they differ in context, focus, and implications.

These studies demonstrate that Tuckman's model remains highly applicable to short-term, task-oriented academic groups. The experience is generally positive for students in these studies; however, a gap remains as interdisciplinary student groups are under-explored, and there is limited knowledge about how students from different academic disciplines move through Tuckman's stages. Thus, by understanding how they navigate forming, storming, norming, and performing, educators can design structured group activities that foster both knowledge acquisition and social skill development as well as add substantial knowledge to the existing literature. Furthermore, calibrating this research within academic settings addresses a critical gap in the literature, which further extends the theoretical application of Tuckman's model beyond its traditional corporate focus.

CONCEPTUAL FRAMEWORK

Figure 1 shows the conceptual framework of the study. This study is originally rooted in McGrath's (1984) group task circumflex model, which is mainly (1) generating ideas, (2) negotiating solutions, (3) choosing between options, and (4) executing tasks. These categories are used to scaffold the stages (Tuckman, 1965, 2016) in group work. The conceptual framework interweaves both models in Figure 1, creating the foundation of the current study.

Figure 1: Conceptual Framework



Based on McGrath's (1984) group dynamics categories, group tasks can be classified that reflect the following four basic processes which are generating ideas, negotiating solutions, choosing between alternatives, and executing tasks. According to Straus (1999), the attributes of each task contribute to distinct processes in group

interaction as they may require different approaches to find solutions and solve problems. Generating tasks involves actions such as brainstorming and gathering ideas, while choosing tasks requires the teams to select the best option or correct answers, which are associated with decision-making activities. Next followed by negotiating tasks, which allows every individual in the group to speculate, question, compromise and agree to reach a mutually acceptable solution. Conflict usually occurs during this stage as differing points of view may create tension within the group. Finally, the executing process focuses on putting the plans discussed before into action or turning ideas into a solid prototype. Along these processes, team members are functioning diversely, creating functional group dynamics to achieve desired outcomes.

The current study aims to align these processes with Tuckman's four stages of group development to further understand group dynamics.

- Generating ideas corresponds to the forming stage, as members of the group brainstorm ideas to get a deeper understanding of the task
- Negotiating solutions is parallel with the storming stage as conflicts and differing viewpoints surface among the team in order to reach a mutual consensus.
- Choosing between options reflects the norming stage as the group works toward making finalized decisions.
- Executing tasks relates to the performing stage, where the team members are finally materializing the mutual decision and achieving their objectives for the tasks.

Hence, by integrating these two models, the conceptual framework offers a comprehensive and systematic perspective for examining students' interactions and skill development during group tasks, while accounting for the diversity of their educational profiles and individual backgrounds.

METHODOLOGY

The focus of this study was to explore group dynamics among ESL learners who participated in a discussion observation assessment during the respective academic year. The discussion observation assessment aimed to measure the learners' social skills in maintaining interactions while displaying positive values and attitudes during professional workplace interactions. It was conducted in groups (4-5 students per group) for 20 minutes after a 5-minute preparation period. The discussion topics, related to project planning, were assigned by instructors and included the following options: i) organizing an Emergency Preparedness & Workplace Safety Seminar, ii) planning a special event to promote the company's new image to the public and consumers, iii) proposing a bimonthly fitness program for staff, iv) organising a family day to strengthen staff relationships, v) planning an official ceremony to launch and promote the new product lines at the company outlet, and vi) organizing a social media outreach promotion to inform the public about available travel packages and showcase attractive travel destinations. The evaluation criteria consisted of content (8 marks), language (10 marks), interaction with others (4 marks) and values (3 marks), accounting for 25% of the overall evaluation.

A total of 63 students enrolled in one communication course at the bachelor's degree level in UiTM Cawangan Kelantan, Machang Campus. The minimum sample size was calculated using the Raosoft sample size calculator (using 5% margin error, 90% confidence level, and 50% response distribution), yielding a minimum recommended sample size of 52 (Raosoft, n.d.). Therefore, using purposive sampling, a total of 53 responses were gathered. The respondents were required to perform in a project planning discussion, and their communication skills, which include social and interpersonal interaction, maintaining group discussion, fulfilling the objectives of assigning members, and defining the job scope for their project, were assessed.

The study employed Tuckman's model of group development, which consists of four stages: forming, storming, norming and performing, all of which should be experienced by group members to perform at their full potential (Vaida & Șerban, 2021). The survey instrument used was an online questionnaire adapted from Tuckman's Teamwork Survey (2016). While the use of a self-reported online questionnaire may introduce social desirability bias, the respondents' responses are deemed to accurately represent their actual experiences during the project planning discussion, as the questionnaire was designed to gather reflective and honest input based on their direct

involvement in the discussion observation assessment. The set of questionnaires containing 31 questions was divided into five sections. The sections were demographic profile (4 items), the forming stage (7 items), the storming stage (5 items), the norming stage (8 items) and lastly, the performing stage (7 items). Different question types, such as category questions and scales, were used in the questionnaire. The demographic section comprises categorical question-types, while the information required to gather the data on the influence of Tuckman's stages of development on group dynamics was measured on a 5-point Likert scale: Never (1), Rarely (2), Sometimes (3), Very Often (4) and Always (5). The items attributed to the stages of group development characterized by Tuckman (1965) are shown in Table 1.

Table 1: Items Measuring Group Dynamics

Forming 1. At the start, we try to have set procedures or protocols to ensure that things are orderly and run. 2. At the start, we assign specific aspects of the discussion to each team member. 3. At the start, we are trying to define the goal and what tasks need to be accomplished. 4. At the start, team members expect the moderator to initiate the discussion. 5. At the start, team members expect the moderator to facilitate the discussion, following the order prepared beforehand by the group. 6. At the start, it seems as if the team members have little understanding of the aspects of the discussion assigned to them. **7.** At the start, although we are not fully sure of the task given, we are excited and proud to be on the team.
Storming 1. During discussions, we are quick to get on with the task at hand and optimize the five-minute preparation time given. 2. During discussions, the moderator tries to keep order and contribute to the task at hand. 3. The tasks given are very different from what we imagined and seem very difficult to accomplish. 4. During discussions, we argue a lot to come to a consensus, even though preparation has been made earlier. 5. During discussions, the goals we have established seem realistic.
Norming 1. In the group, we have thorough procedures for agreeing on our objectives of the assessment and planning the way we will perform our tasks. 2. In the group, each of us is responsible for one aspect of the discussion and delivers the task accordingly. 3. In the group, the moderator ensures that we follow the order of the discussion as prepared earlier. 4. In the group, we have accepted each other as members of the team. 5. In the group, we try to achieve harmony by avoiding conflict. 6. In the group, the team is often tempted to fulfil the task within the given time (20 minutes). 7. In the group, we tolerate others' point of views to reach a consensus for each aspect of discussion. **8.** In the group, we are tempted to share personal experience with each other relating to the task given
Performing 1. In the end, our team feels that we are all in it together and shares responsibilities for the team to deliver the task successfully. 2. In the end, we enjoy working together; we have a fun and productive time. 3. In the end, the moderator is democratic and collaborative. 4. In the end, we fully accept each other's strengths and weaknesses. 5. In the end, we are able to reach a consensus on each aspect of the discussion given in the task. 6. In the end, there is a close attachment to the team. 7. In the end, we managed to get an output from the team members on the assigned aspects of discussion.

The data analysis of the study involved descriptive analysis, reliability analysis and parametric statistical analysis. Firstly, a descriptive analysis was chosen to describe the influence of Tuckman's model of group development on the group dynamics of ESL learners in the discussion observation assessment. Mean scores indicating how often the learners experience or engage in the group dynamics while performing the task assigned, and standard deviation were presented in tables. A reliability analysis was performed to determine the reliability measures for the measuring items across the four sections. The analysis showed a Cronbach's Alpha value of 0.952, indicating a good reliability and internal consistency of the instrument used. The normality condition was also achieved as the skewness values are between -1.0 and +1.0, as supported by Pallant (2011).

Table 2: Reliability Statistics and Skewness Result

Tuckman's Stages of Group Development	**Cronbach's Alpha**	**Skewness**	**Distribution**
Forming Stage	0.853	0.104	Approximately normal
Storming Stage	0.666	0.346	Approximately normal
Norming Stage	0.887	0.000	Approximately normal
Performing Stage	0.908	0.145	Approximately normal
	0.952		

As presented in Table 2, the data obtained meet the required assumption for employing the parametric statistical analysis. The independent samples t-test was conducted to investigate significant mean differences between Tuckman's model of group development (forming, storming, norming and performing) and the respondents' academic disciplines. The differences between the mean scores of the four stages in group development and academic disciplines were calculated to examine these relationships. A *p*-value of less than 0.05 indicates significant differences between the two variables, thus allowing rejection of the null hypothesis, H_0. The proposed hypotheses for the study are as follows:

H_1: There is a significant mean difference between the forming stage and students' academic disciplines

H_2: There is a significant mean difference between the storming stage and students' academic disciplines

H_3: There is a significant mean difference between the norming stage and students' academic disciplines

H_4: There is a significant mean difference between the performing stage and students' academic disciplines

FINDINGS

Demographic Profile

Table 3 presents the frequency and percentage of the research respondents' demographic profile. Of the 53 respondents, 12 were male and 41 were female. The respondents were between the ages of 19 and 24 years old. The respondents presented two academic disciplines: 14 or 26.4% were from science and technology, while the majority, 39 (73.6%), belonged to social sciences and humanities. The respondents' previous educational background varied, with 30 having completed matriculation colleges, 15 from diploma programmes and 4 each from foundation studies and the STPM level.

Table 3: Respondents' Demographic Profile

Variable	**Description**	**Frequency**	**Percentage (%)**
Gender	Male	12	22.6

	Female	41	77.4
Age Group	19 to 21 years old	29	54.7
	22 to 24 years old	24	45.3
Academic Discipline	Science & Technology	14	26.4
	Social Sciences & Humanities	39	73.6
Previous Level of Education	Diploma	15	28.3
	Matriculation	30	56.6
	Foundation studies	4	7.5
	SPTM & others	4	7.5

The Influence of Tuckman's Model of Group Development on Group Dynamics in a Discussion Observation Assessment

Table 4 depicts the summary statistics, which include mean scores, standard deviation, the maximum and minimum values for the four stages of group development: forming, storming, norming and performing. Based on the table, the performing stage had the highest mean value (M=4.1995), followed by the norming stage (M=4.0825), the forming stage (M=3.9227) and the storming stage having the lowest mean (M=3.6679). This finding is consistent with the stages of group development as illustrated by Tuckman (1965), in which at the final stage of group discussion, i.e. the performing stage, the group performs with its defined roles to complete the task, and the decisions they made are positively reinforced by the group as a whole. In this context, Kim and Iwuchukwu (2022) reported that students who enrolled in a research elective with project-based course components experienced higher satisfaction with both their team performance and individual roles during the performing stage. Likewise, Yean et al. (2024) found that as students worked together and found their shared moments enjoyable and meaningful, they reached their best phase of collaboration. Meanwhile, in the storming stage, the group members started to confront one another and hence, which resulted in intra- or intergroup conflicts. As indicated in the study's findings, the group dynamics were occasionally impacted by the storming stage described in Tuckman's 1965 model. While conflicts posed disagreement among the group members, they were able to establish their common goals with the presence of group moderators. Sokman et al. (2023) highlighted that the leaders' roles to provide clear guidance and anticipate group dynamics demonstrated their capabilities in completing the assigned task.

Table 4: Summary Statistics

Tuckman's Stages of Group Development	**Mean ± Std. Deviation**	**Minimum**	**Maximum**
Forming Stage	3.9227 ± 0.526	2.40	5.00
Storming Stage	3.6679 ± 0.529	2.57	5.00
Norming Stage	4.0825 ± 0.526	3.00	5.00
Performing Stage	4.1995 ± 0.535	3.00	5.00

Tuckman's Stages of Group Development and ESL Learners' Academic Disciplines

Table 5 summarises the findings for the independent samples t-test, which involve the forming, storming, norming and performing stages of group development. It aimed to accomplish the second research objective—to compare ESL learners' academic disciplines and Tuckman's (1965) stages of group development. Based on

the analysis, Levene's test for equality of variances for all four stages was non-significant, so equal variances could be assumed. This study concluded that there was a significant difference between ESL learners' academic disciplines and one of the stages in group development, particularly during the performing stage. As highlighted by Largent (2016), teams from nine cohorts of students involved in his five-academic year study generally progressed through Tuckman's stages of small group development model, with the performing stage characterized by effective collaboration and successful task execution. While Tuckman's model is widely acknowledged as a robust framework applicable across various academic disciplines, students did experience a set of unique challenges particularly in the storming and norming stages, including leadership issues, prioritization conflicts or disagreement and work commitments (Zirar et al., 2025). As academic discipline influences became more evident in the later stage, this therefore indicates that their strongest influence on group dynamics was observed in the performing stage. Meanwhile, there were no significant differences during the other three stages, namely the forming, storming, and norming stages.

Table 5: Summary of Independent Samples T-Test

		Levene's Test		**T-Test**	
		F	**Sig.**	**T**	**Sig. (2-tailed)**
Forming Stage	Equal variances assumed	3.776	0.058	1.246	0.218
	Equal variances not assumed			1.021	0.322
Storming Stage	Equal variances assumed	0.016	0.900	1.847	0.071
	Equal variances not assumed			1.879	0.073
Norming Stage	Equal variances assumed	2.978	0.090	1.957	0.056
	Equal variances not assumed			1.722	0.102
Performing Stage	Equal variances assumed	1.150	0.289	2.290	0.026
	Equal variances not assumed			2.124	0.046

Table 6 depicts the results of group dynamics during the performing stage across the ESL learners' academic disciplines—science and technology, and social sciences and humanities. As indicated in the table, the mean score for science and technology (M=4.469, SD=0.5753) was significantly higher than that for social sciences and humanities (M=4.103, SD=0.492). Thus, the results illustrate that ESL learners from science and technology were more impacted by the performing stage of group development as compared to those from social sciences and humanities. Bager-Elsborg (2018), in his findings, highlighted the need to address disciplinary dispositions when working in groups to achieve more effective academic outcomes, and this could be realized by acknowledging specific disciplinary orientations and expectations of the participants involved in the discussion.

Table 6: Performing Stage and ESL Learners' Academic Disciplines

	Academic Discipline	**N**	**Mean**	**SD**
Performing Stage	Science & Technology	14	4.469	0.5753
	Social Sciences & Humanities	39	4.103	0.492

CONCLUSION

Based on the findings, it can be concluded that the students were progressing linearly through the four stages,

namely forming, storming, norming and performing, proving that Tuckman's model remains relevant in the short term and task-oriented project within an academic context. Among the four stages, the last stage, which is the performing stage, demonstrated a high level of collaborative work and shared responsibility, resulting in smoother group interaction towards the end. This echoes with findings from Wan Yadri et. al (2024) and Yean et al. (2024), which remark on trust, communication and effective leadership skills in accomplishing team goals.In addition, the current study also explored the influence of academic discipline towards group dynamics and found that, again, significant results were obtained in the performing stage as the students from science and technology showed higher collaborative outcomes than those from social sciences. This finding corresponds with Bager-Elsborg's (2018), who stated that disciplinary orientation shapes interaction styles and group performance. However, it should be noted that there are no significant differences observed during the previous three stages - forming, norming and performing, hence, suggesting that students go through similar experiences in the early stages of the group development process, although they are from diverse academic disciplines. It might be attributed to the nature of the group assessments, as Johnson and Johnson (2015) assert, highlighting that students' interdependence in such assessments is rooted in the direct influence of their interaction and cooperation on the group's overall performance.

This study applied Tuckman's (1965) model of group development to explore ESL learners' group dynamics during a discussion observation assessment, offering valuable insights into collaborative learning in higher education. By looking through the pedagogical lens, these findings highlight the importance of targeted support, systematic guidance, and meticulously designed group tasks to ensure productive collaboration that is measured by their success in accomplishing the objectives. According to Sokman et al. (2023), educators should support group work by incorporating clear role assignments and expectations as well as providing necessary guidance, particularly in conflict-prone stages. It is also worth noting that experienced instructors will strategically adapt their teaching to align with Tuckman's group development stages, providing guidance, resolving conflicts, and fostering collaboration. By orienting their strategies around group dynamics, they maximize students' potential, enhance teamwork, and ensure learning objectives are effectively achieved, particularly in interdisciplinary and ESL classroom contexts. Future research should delve into investigating further how different academic disciplines influence the group work outcomes, as it is evident in the current study that similar input produced different outputs. Apart from that, it is recommended for future researchers to investigate group dynamics across other types of assessments beyond those currently researched, to gain a better understanding of how every group member progresses in diverse contexts.

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