Exploring Group Work Interaction Using Tuckman's Model

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ABSTRACT

At higher education levels, most projects require students to work in groups. However, students often face challenges, such as miscommunication, and rarely interact with group members, which can significantly impact the success or failure of the group's work. This study investigates group work interaction among UiTM Students using Tuckman's model of group development, which comprises four stages: forming, storming, norming and performing. A quantitative survey was conducted using a structured questionnaire with 29 Likert-scale items distributed to a random sample of 114 students. The results showed that students viewed all four stages positively, with the performing stage showing the highest ratings for task completion, collaboration and problem-solving. Significant positive correlations were also found between all stages, with the strongest relationship observed between the norming and performing stages. This correlation underscores the significance of cohesion and clear norms in achieving high group performance. These findings suggest that educators should guide students through group work more intentionally to foster cooperation, enhance overall performance and resolve conflict.

Keywords: Group Work, Tuckman's Model, Social Learning Theory

INTRODUCTION

For a long time, group work has been recognised as a crucial pedagogical approach in language learning settings, where it promotes not only linguistic competence but also social and cognitive development (Long & Porter, 1985; Swain & Lapkin, 1998; Dao et al., 2021). In various educational settings, students are often placed in small groups to complete tasks, brainstorm, and to construct new knowledge collectively. The recent meta-analyses conducted by Zhang et al. (2020) confirmed that group work enhances learners' proficiency benefits compared to practising individually. This kind of interaction aligns with the principles of Social Learning Theory, which suggests that observation, imitation and modelling others play an important role in enabling individuals to acquire knowledge, skills and behaviours (Bandura, 1971). Within this framework, students engage in reciprocal information exchange, negotiate meaning and develop communicative competence, which are the essential elements of group work. Collaborative language tasks activate the mirror neuron system more intensely than individual work, as neurocognitive studies have shown (Li et al., 2023), reinforcing the idea that group dynamics foster communicative competence.

Studies frequently apply Tuckman's Model of group development (1965; 1977) to gain a better understanding of the dynamics of group interaction, which outlines four sequential stages, namely forming, storming, norming, and performing. Contemporary research has confirmed the stages of the model in virtual environments, positing that storming phases are shorter but are more intense in online settings (Kohnke & Moorhouse, 2022). Every stage reflects a significant phase in group evolution, distinguished by a range of

degrees of cohesion, conflict, delegation of duties, and task orientation. These stages provide valuable insights into how learners adjust to group tasks, foster interpersonal relationships, and pursue shared goals, especially in language learning settings. Regardless of the prevalence of group work in language classrooms, factors such as group composition, individual learner traits, task design, and instructional support have always been important determinants of the quality of interactions in group work (Zhou et al. 2023; Jin et al., 2021). By studying Tuckman's theoretical framework and the broader perspective of Social Learning Theory, this study aims to investigate how group members interact through different stages and phases of group development, thereby elucidating the mechanisms that reinforce effective collaboration in language learning contexts.

Statement of Problem

One of the most crucial components in collaborative learning is, of course, group work. However, limited quantitative research has been conducted on how students experience each of Tuckman's stages of the group developmental model. Although Tuckman's framework has been widely used in educational settings, most research focuses on qualitative methods or emphasises the results, rather than quantifying students' actual experiences and perceptions during each stage (Meneses & Ortega-Ruiz, 2015; Rickards et al., 2001). Recent studies by Alsubaie (2022) and Fransen et al. (2013) emphasise the gaps in understanding how learners manage interpersonal conflicts (storming) and establish cohesion (norming), particularly in various academic contexts. Additionally, past research often studies the stages in isolation, discounting potential reciprocal relationships, such as whether the norming stage affects the performing stage or whether an unresolved storming stage delays the process (Kuypers et al., 2016). This can be addressed by studying the statistical relationships between stages.

The need for this research is further supported by the need for rigorous quantitative data on group development (Alsubaie, 2022). According to Phipps et al. (2017), Current methodologies, such as retrospective surveys, are often insufficient for validating scales to compare perceptions at every stage. These gaps are addressed in this study by using a structured survey methodology to:

1. Quantitatively analyse learners' perceptions of each Tuckman's stage using Likert-scale items;
2. Analyse stage inter-dependencies through correlation and regression analysis; and
3. Identify demographic predictors (e.g. prior group experience, cultural background) of stage perceptions.

The research findings will provide empirical benchmarks for educators to tailor specific interventions (e.g., conflict-resolution training during the storming stage) and enhance group work assessment mechanisms.

This study was done to explore stages in group work interactions. Specifically, this study is done to answer the following questions;

- How do learners perceive the forming stage in group work?
- How do learners perceive the storming stage in group work?
- How do learners perceive the norming stage in group work?
- How do learners perceive the performing stage in group work?
- Is there a relationship between all stages in group work?

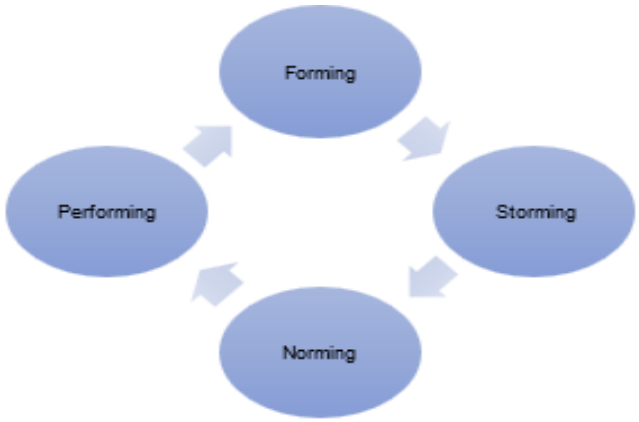
LITERATURE REVIEW

Group work is a collaborative learning approach in which individuals come together to achieve a similar objective/ goal. Group work has been recognised for offering various benefits. It promotes active engagement and a supportive learning environment as members can learn from one another's feedback and offer constructive feedback (Vo, 2023; Ramadan & Jember, 2024). During the process, learners engaged in three dimensions: Behavioural (learning activities), emotional (feelings about peers, teacher, tasks) and cognitive (depth of investment in learning) (Sjolie et al., (2022) . The end product of the group work is not the only product of group interactions. According to Rahmat (2020), group work improves their communication skills.

Learners are able to share feedback among peers, pinpoint learning gaps, and identify areas for improvement while working in groups (Ramadan & Jember, 2024). The interaction helps participants improve the way they communicate to complete the assigned task. Additionally, group conflicts are common in group work, allowing participants to practice their problem-solving skills.

To better understand how group dynamics evolve and support these outcomes, this study adopts Tuckman's (1965) stages of group work. Figure 1 shows the conceptual framework of the study and how its application allows a more collaborative learning environment. The first stage is the forming stage. This is the initial stage where participants are getting to know one another and becoming familiar with the assigned group task. The second stage is the storming stage. This is the stage where all team members give their suggestions for the task. This stage may contain some disagreements and some conflicts. Nevertheless, the group settles down and enters the third stage which is the norming stage. This is the stage where all participants strive to make the group task a success. The last stage is the performance stage. This is where the group task is evaluated. Does one stage of the group work influence the next stage? This study also investigates whether there are relationships between all stages of group work.

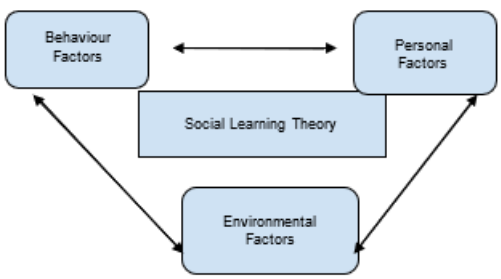
Figure 1: Conceptual framework of the Study



Relationship between all stages in group work

The natural progression of group dynamics is highly influenced by learning that occurs among its members. Thus, Tuckman's (1965) model of group development—Forming, Storming, Norming, and Performing can be related to Social learning Theory (SLT). SLT is a framework developed by Albert Bandura in the 1970s (Bandura, 1977) that highlights how people learn new attitudes, behaviours and skills through observation of others' actions and their consequences in their environment. Bandura highlighted four main processes involved in social learning which are Attention (the learner must focus on to the behaviour being modeled), Retention (the details of the behaviours that were observed), Reproduction (the learners must have the physical and cognitive ability to imitate the observed behaviour) and Motivation (there must be a reason or reinforcement for the behaviour to be replicated) (Firmansyah & Saepoloh, 2022). Figure 2 shows the Social Learning Theory framework.

Figure 2: Social Learning Theory



(**Source:** Bandura, 1977)

Within structured social settings, such as collaborative groups, individuals learn from one another by sharing experiences and modeling behaviours (Sjolie et al., 2022). As group members engage in discussions and collectively determine effective solutions/ approaches, these social exchanges facilitate mutual learning. While these group interactions promote collaboration and learning among each other, they also come with various challenges, particularly when viewed through Tuckman's (1965) stages of group development.

In the Forming stage, group members may be challenged with uncertainties regarding goals/directions and expectations, which can limit participation among members (Guan, 2024). Zulkifli et al. (2025) found that strong leadership is crucial to reduce ambiguity. Entering Storming stage, conflicts and power struggle may emerge as members voice their opinions and challenge each other's views. Thus, effective leadership is needed to balance the cohesion and individual differences (Muscat-o et al., 2023). In the Norming stage, collaboration may improve but other issues like loafing may arise, causing threats to the effectiveness of the group (Luo et al., 2021; McKay & Sridharan, 2023). In the final stage, Performing is characterised by higher productivity, ongoing challenges to maintain motivations and balanced participation. (Putra & Pratama, 2021). This highlights the importance of leadership, communication and role-clarity throughout the development of a group to deal with challenges while maximising the group potential.

The stages of forming, storming, norming, and performing do not just describe group development. These stages explored learners' interaction, adaptation, and growth within collaborative environments. Previous studies have examined these stages to better understand group dynamics. For example, a study by Zulkifli et al. (2025) was done to explore learners' perceptions of interactions across Tuckman's four stages and examined the relationships between these stages within educational settings. The survey employed a 5-point Likert scale and was administered to 255 undergraduate students from various disciplines. Participants reported that the key to effective teamwork was solid structure, strong leadership, open communication, and shared responsibility. Results also revealed that there were strong relationships between the stages, supporting Tuckman's model. Overall, the study emphasised the importance of encouraging support and open communication to help learners adapt to group work.

Similarly, a study by Wan Yadri et al. (2024) employed a quantitative method to examine learners' conflict perceptions and cognitive-emotional traits across Tuckman's four group development stages (forming, storming, norming, performing). Using a 5-point Likert scale, the survey was distributed to 178 undergraduate students. Findings show that respondents had positive group experiences and managed conflicts well. It also reveals strong links between most stages, but a weak correlation between performing and storming. In the end, this study highlighted the importance of clear guidelines and support in group formation to help prevent conflicts early. This ensures a smoother progression through the stages, which then allows more effective collaboration among group members.

A qualitative study by Wei et. al (2023) done on two engineering students through one-to-one interviews found that students experienced some stages at the same time and the dynamics of their groups were influenced by external factors. The study highlighted that instructors should encourage a positive atmosphere and prepare students to handle conflicts fairly and strategically and help students build trust and give them space to improve.

Numerous studies have investigated group development using Tuckman's model, but a majority of recent studies tend to focus on the qualitative approaches that explore learners' experiences and perceptions of group dynamics. It is undeniable that this kind of research provides a rich understanding of the dynamics in the group. However, the scarcity of quantitative studies on inter-stage relationships of Tuckman's model using statistical analyses should be addressed. Thus, this study intends to fill in this gap by analysing each stage of Tuckman's model quantitatively.

METHODOLOGY

This study employed a quantitative study design to explore students' perceptions of stages in group work based on Tuckman's model. A convenient sample of 114 participants from an undergraduate public university

responded to the survey. Convenient sampling allowed for data collection; however, it may limit the generalizability of the findings. This is due to potential sampling bias as well as a lack of representation across all academic disciplines. The instrument used is a 5-point Likert-scale survey. Table 1 below shows the categories used for the Likert scale; 1 is for Almost never, 2 is for Seldom, 3 is for Occasionally, 4 is for Frequently and 5 is for Almost Always.

Table 1- Likert scale Use

1	Almost Never
2	Seldom
3	Occasionally
4	Frequently
5	Almost Always

Table 2 shows the distribution of items in the survey. The instrument for this study is rooted in Tuckman (1965) to reveal the variables in the table below. Section B has 7 items on Forming. Section C has 6 items on Storming, Section D has 8 items on Norming, and section E has 8 items on Performing.

Table 2- Distribution of Items in the Survey

Section	Stage	Items
B	Forming	7
C	Storming	6
D	Norming	8
E	Performing	8
	TOTAL ITEMS	29

Table 3 shows the reliability of the survey. The analysis shows a Cronbach alpha of .884 for all 29 items; thus, revealing a good reliability of the instrument used (Jackson, 2015). Further analysis using SPSS is to analyse the findings and answer the research questions for this study.

Table 3 - Reliability Statistics

Cronbach's Alpha	No. of Items
.884	29

RESULTS AND DISCUSSION

Demographic Analysis

Table 4 - Percentage for Demographic Analysis

Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	30%
		Female	70%
2	Cluster	Science & Technology	11%
		Social Sciences & Humanities	41%
		Business & Management	48%

This section presents the demographic analysis of the study's respondents. 114 students from various faculties responded, and it was revealed that the majority of the respondents were females, which constituted 70% of the responses (n=80). The rest of the respondents were males, which constitutes 30% of the respondents (n=34). In terms of discipline clusters, students of 3 educational clusters responded to the questionnaire, namely Science and Technology, Social Science and Humanities, and Business and Management. 11% (n=13) of the respondents were from Science and Technology discipline, 41% (n=47) were from Social Sciences and Humanities, and lastly 48% (n=54) consisted of Business and Management cluster.

Findings for Forming Stage

This section presents data to answer Research Question 1 - How do learners perceive the forming stage in group work?

Table 5 - Mean for Forming Stage

Questions	Mean	SD
SECTCaFQ1 Before we start group activities, we set rule or procedures to ensure that everything runs smoothly.	4.3	0.8
SECTCaFQ2 Before we start group activities, we assign specific roles to team members.	4.4	0.7
SECTCaFQ3 Before we start group activities, we determine the goal and what tasks need to be accomplished.	4.5	0.7
SECTCaFQ4 Before we begin any group activity, our team members may be reluctant or unwilling to seek help from others.	3.3	1.2
SECTCaFQ5 Before we begin any group activity, team members do not completely trust each other and closely monitor others on a specific task.	3	1.3
SECTCaFQ6 At the beginning, it seems like we are making little progress to achieve the goal of the task.	3.9	0.9
SECTCaFQ7 At the beginning, even if we are not completely sure about the activity's goals and issues, we are excited and proud to be on the team.	3.9	0.9

Table 5 shows the descriptive statistics for the forming stage in group work. It reveals a generally positive perception among learners. Item 3, defining the goal and identifying necessary tasks, showed the highest mean score (M=4.5, SD=0.7), followed narrowly by item 2, assigning specific roles to team members (M=4.4, SD=0.7) and the third highest mean score is item 1, setting procedures and protocols to sustain order (M=4.3, SD=0.8). The respondents also showed moderate agreement that (item 6) initially, it felt like little was being completed (M=3.9, SD=0.9) and (item 7) they still felt excited and proud to be on the team regardless of the uncertainty about goals (M= 3.9, SD=0.9). However, the data showed lower mean score that (item 4) they were reluctance to enquire for help, at start (M=3.3, SD=1.2) and the lowest mean score is item 5 which indicated the respondents' lack of trust leading to keeping a watchful eye on teammates' tasks (M=3.0, SD=1.3), implying these facets were less prominent in learners' perceptions at the forming stage.

Findings for Storming Stage

This section presents data to answer Research Question 2 - How do learners perceive the storming stage in group work?

Table 6 - Mean for Storming Stage

Questions	Mean	SD
SECTCbSQ1 During discussions, we are quick to get on with the task at hand and do not spend too much time in the planning stage.	3.6	0.9
SECTCbSQ2 During discussions, the team leader tries to stay organized and contributes to the task at hand.	4.2	0.7
SECTCbSQ3 During discussions, the tasks are very different from what we imagined and seem very difficult to accomplish.	3.3	0.9
SECTCbSQ4 During discussions, we argue a lot even though we agree on the real issues.	2.9	1.2
SECTCbSQ5 During discussions, the goals we have established seem unrealistic.	2.9	1.1
SECTCbSQ6 During discussions, there is a lot of resistance to the tasks at hand and approaches to quality improvement.	3.3	1.1

Table 6 shows the mean for storming stage. The highest mean is item 2 (M=4.2,SD=0.7), which states that during discussions, the team leader tries to keep order and contribute their ideas. Next, item 1 (M=3.6, SD=0.9) reports that during discussions, the students were quick to begin the task given. Two items share the same mean of 2.9. The first is item 4 (M=2.9, SD=1.2), which states that during discussions, the learners felt the goals were not realistic. Finally, item 5 (M=2.9, SD=1.1) states that the goals given were unrealistic.

Findings for Norming Stage

This section presents data to answer research question 3 - How do learners perceive the norming stage in group work? The details are presented in the following table.

Table 7 - Mean for Norming Stage

Questions	Mean	SD
SECTCcNQ1 In the group, we have thorough procedures for agreeing on our objectives and planning the way we will perform our tasks.	4.1	0.8
SECTCcNQ2 In the group, we take our team's goals and objectives literally, and assume a shared understanding.	4.2	0.7
SECTCcNQ3 In the group, the team leader ensures that we follow the procedures, do not argue, do not interrupt, and keep to the point.	4	0.8
SECTCcNQ4 In the group, we have accepted each other as members of the team.	4.4	0.8
SECTCcNQ5 In the group, we try to achieve harmony by avoiding conflict.	4.4	0.6
SECTCcNQ6	3.7	1

In the group, the team is often tempted to do more than what was required for the project.		
SECTCcNQ7 In the group, we express criticism of others constructively	3.4	1.1
SECTCcNQ8 In the group, we often share personal problems with each other.	3	1.2

The table shows some highlights of means for the Norming stage. The highest means are recorded by Items 4 and 5 with mean 4.4, SD=0.8 and SD=0.6, respectively. A majority of students agreed that they accepted each other as members of the team, which means they acknowledged each other's roles in the team. Besides that, they agreed that they tried to achieve harmony by avoiding any conflicts that arose while completing their tasks. The second highest mean (M=4.2, SD=0.7) is by Item 2, in which most students agreed that they understood the team's goals and objectives as outlined and assumed that everybody shared the same understanding. Next, Item 1 recorded the mean 4.1, SD=0.8 which shows students agreed on having thorough procedures for agreeing on the objectives and planning on how the tasks are performed. Item 3 recorded the next highest mean with mean=4, SD=0.8, where students agreed that they followed procedures, avoided arguments, interruptions and kept to the point. Nevertheless, the three items with the least means, mean=3.7, 3.4, 3 and SD=1.0, 1.1 and 1.2 respectively showed that they were often tempted to go beyond the scope, expressed constructive criticism and shared problems, indicating that in the norming stage, although not agreed by most, students are settling to get comfortable with each other.

Findings for Performance Stage

This section provides data and analysis aimed at addressing Research Question 4 - How do learners perceive the performing stage in group work? The details are presented in the following table.

Table 8 - Mean for Performing Stage

Questions	Mean	SD
SECTCdPQ1 In the end, our team feels that we are all in it together and share responsibilities for the team's success or failure	4.3	0.7
SECTCdPQ2 In the end, we do not have fixed procedures, we make them up as the task or project progresses.	3.7	0.9
SECTCdPQ3 In the end, we enjoy working together; we have a fun and productive time.	4.4	0.8
SECTCdPQ4 In the end, the team leader is democratic and collaborative.	4.3	0.7
SECTCdPQ5 In the end, we fully accept each other's strengths and weaknesses.	4.4	0.7
SECTCdPQ6 In the end, we are able to work through group problems.	4.4	0.8
SECTCdPQ7 In the end, there is a close attachment to the team.	4.2	0.8
SECTCdPQ8 In the end, we get a lot of work done.	4.6	0.6

Table 8 shows the mean for performing stage. The highest mean is item 8 (M=4.6, SD=0.6), which states that the majority of learners were able to accomplish a significant amount of work through focused effort and effective collaboration, despite facing challenges. The second highest mean (M=4.4) is items 3, 5, and 6. The items state that when the learners collaborated as a team, they had a great time while also getting a lot accomplished (item 3), they recognised and valued each other's abilities as well as areas for growth (item 5), and they were able to resolve challenges that arise within the group (item 6). Next, 2 items share the mean of 4.3, SD=0.7. Firstly, item 1 states that the learners had a strong sense of unity that allowed them to collectively share responsibility for both the successes and setbacks that they experienced. Then, item 4 states that the learners felt that their team leader encouraged input from them that fostered a democratic and collaborative environment. Next, item 7 (M=4.2, SD=0.8) states that the learners felt a strong sense of connection and were emotionally invested in team members. Lastly, item 2 (M=3.7, SD=0.9) indicates that only a few learners believed that their approach was flexible; they did not follow rigid procedures but instead adapted and developed processes as the task or project evolved.

Exploratory Statistics

Findings for the Relationship between all stages in group work

This section presents data to answer Research Question 5 - Is there a relationship between all stages in group work? To determine if there is a significant association in the mean scores between all stages in group work, data is analysed using SPSS for correlations. Results are presented separately in tables 9, 10, 11 and 12 below.

Table 9 - Correlation between Forming and Storming Stage

		FORMING	STORMING
FORMING	Pearson (Correlation)	1	.545**
	Sig (2-tailed)		.000
	N	114	114
STORMING	Pearson (Correlation)	.545**	1
	Sig (2-tailed)	.000	
	N	114	114

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

Table 9 shows that there is an association between forming and storming stages. Correlation analysis shows that there is a highly significant association between forming and storming stages (r=.545**) and (p=.000). According to Jackson (2015), 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 forming and storming stages.

Table 10 - Correlation between Storming and Norming Stage

		STORMING	NORMING
STORMING	Pearson (Correlation)	1	.455**
	Sig (2-tailed)		.000
	N	114	114
NORMING	Pearson (Correlation)	.455**	1
	Sig (2-tailed)	.000	
	N	114	114

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

Table 10 shows that there is an association between storming and norming stages. Correlation analysis shows that there is a moderately significant association between storming and norming (r=.455**) and (p=.000). According to Jackson (2015), 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 moderate positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between storming and norming.

Table 11 - Correlation between Norming and Performing Stage

		NORMING	PERFORMING
NORMING	Pearson (Correlation)	1	.669**
	Sig (2-tailed)		.000
	N	114	114
PERFORMING	Pearson (Correlation)	.669**	1
	Sig (2-tailed)	.000	
	N	114	114

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

Table 11 shows that there is an association between norming and performing stages. Correlation analysis shows that there is a high significant association between norming and performing stages (r=.669**) and (p=.000). According to Jackson (2015), 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 norming and performing stages.

Table 12 - Correlation between Performing and Forming Stage

		PERFORMING	FORMING
PERFORMING	Pearson (Correlation)	1	.326**
	Sig (2-tailed)		.000
	N	114	114
FORMING	Pearson (Correlation)	.326**	1
	Sig (2-tailed)	.000	
	N	114	114

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

Table 12 shows that there is an association between performing and forming stages. Correlation analysis shows that there is a moderate significant association between performing and forming stages (r=.326**) and (p=.000). According to Jackson (2015), coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and moderate positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between performing and forming stages.

CONCLUSION

This study quantitatively investigated students' perceptions of Tuckman's four stages of group development and examined how these stages relate to one another in collaborative learning contexts. Results confirmed that all stages were positively perceived and interrelated, with the strongest link between norming and performing. This pattern reinforces the sequential nature of Tuckman's model and demonstrates that cohesion and established norms are critical precursors to effective group performance.

Summary of Findings and Discussions

This study examined students' perceptions of Tuckman's four stages of group development—forming, storming, norming, and performing—and explored the relationships among them. Overall, the findings revealed that students viewed all stages positively, indicating that group work is a valued and effective learning practice in higher education. However, several meaningful patterns emerged that warrant deeper interpretation.

Forming Stage

Students rated goal definition and role assignment highest during the forming stage. This pattern suggests a preference for structured beginnings, reflecting Malaysian learners' tendency toward clarity and guidance in collaborative tasks. In collectivist learning contexts, students may rely on clear leadership and defined procedures to reduce uncertainty and establish psychological safety. This aligns with Social Learning Theory (Bandura, 1977), as observing peers and leaders setting expectations helps model appropriate participation behaviour.

Storming Stage

Conflict (storming) was perceived as less frequent compared to other stages. Several contextual explanations may account for this. First, Malaysian students often prioritise harmony and avoid open confrontation, consistent with high power distance and collectivist cultural norms (Hofstede, 2001). Second, effective instructor monitoring or structured project guidelines may have pre-empted potential disputes. Finally, a reluctance to self-report conflict could stem from social desirability or concern about being judged negatively by peers. These factors may collectively result in the underreporting of conflict, making storming appear less prominent than in Western studies of Tuckman's model.

Norming Stage

The high mean scores for acceptance of group members and avoidance of conflict indicate that harmony becomes a key goal once groups stabilise. Students appear to substitute overt disagreement with cooperative adaptation, which reinforces cohesion but may suppress constructive criticism. This stage demonstrates how learners internalise observed cooperative behaviours and maintain them through mutual reinforcement—an example of modelling and motivation processes described in Social Learning Theory. The consistent interpersonal harmony reported here may act as a foundation for the strong positive correlation observed between norming and performing.

Performing Stage

The performing stage received the highest overall ratings, suggesting that once cohesion and trust are established, groups achieve high productivity and satisfaction. This outcome is consistent with Tuckman's (1965) description of the performing phase as characterised by effective communication and task completion. Students' enjoyment of teamwork and collective responsibility also highlights the emotional engagement component of social learning, where shared success reinforces further collaborative behaviour.

Interrelationship Among Stages

Correlational results demonstrated moderate to strong positive links among all four stages, particularly between norming and performing (r = .669). This provides quantitative evidence supporting Tuckman's sequential and interrelated model, implying that successful completion of earlier stages facilitates later performance. The findings also affirm that social and emotional cohesion (norming) is a significant predictor of collective productivity (performing). Thus, while the storming phase may appear muted, its resolution—whether explicit or implicit—still contributes to smoother progression through later stages.

Collectively, these findings highlight that group development among students follows Tuckman's general sequence but may manifest differently in degree and intensity due to cultural, instructional, and interpersonal dynamics.

Theoretical and Conceptual Implications

This study highlights Social Learning Theory, as proposed by Bandura. It emphasises that learning occurs through observation and environment. Other than that, learning also occurs through reciprocal influence between personal factors, behaviour and environment. The positive ratings showed that during the forming stage of a group project, students tend to create clear goals and assign roles. Students also observe and mimic effective behaviour demonstrated by their group members and leaders, which helps to establish a productive and organised team dynamic. Furthermore, the storming stage indicates how group members manage conflicts and change behaviour accordingly through learning from one another. Other than that, the performance stage shows the strong outcomes and high correlations between norming and performing (r = 0.669). This showed that students are confident in their abilities and see positive examples from their group members. So that students tend to perform better.

In addition, this student lends support to Tuckman's model framework of four stages, which are forming, storming, norming and performing. The significant correlation between all stages shows that group development is a progressive and interconnected process. The norming and performing stages demonstrated a strong link between these two stages, where group trust, cohesion, and shared norms significantly affected group productivity and problem-solving. These results highlighted the importance of addressing early-stage problems, such as conflict resolution and trust-building, to ensure smooth and successful work progression later on. The conceptual model that emerges from this study can hopefully guide trainers and educators in choosing the right actions at the right stage to ensure group work is successful.

Pedagogical Implications

The findings of this study have revealed that the stages of Tuckman's model of group development are indeed interrelated. As a result, several pedagogical implications about the topic have been identified. Firstly, because the stages are progressive and related to one another, it highlights the importance of the instructor's role in managing early-stage interactions to ensure group performance later on (Bonebright, 2010). This means teachers or instructors should design activities that scaffold and promote healthy interactions throughout the stages. By deliberately aligning instructional strategies with the development needs of each stage, educators can enhance social cohesion and group performance. Such an approach not only builds collaborative competence but also prepares students for real-world teamwork where navigating group interactions is as critical as mastering content knowledge.

Another implication that has been identified is that there is a systemic need for educational institution administrators, such as schools and universities, to introduce communication workshops for students, especially first-year students, in order to prepare them for future group assignments. Targeted communication workshops for students can equip them with the interpersonal skills needed to navigate through the group stage, especially during the Storming and Norming stages, where conflict or unclear expectations often hinder group productivity. Such workshops can focus on active listening, constructive feedback and conflict

resolution, which have been shown to improve problem-solving in collaborative environments (Johnson & Johnson, 2009).

Suggestions for Future Research

This study employed a quantitative research approach to investigate students' perceptions of the stages in group work. Moving forward, future researchers could employ different approaches, such as mixed methods, to build on this study's findings by providing deeper insight into the reasons way students feel the way they do. It is also suggested that future research consider an intervention-based study, such as implementing communication workshops, to evaluate their effectiveness in helping students to navigate group work. In addition, a longitudinal study could be conducted to investigate whether students' perceptions change over time.

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