What is the Relationship Between All Stages in Group Work?

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ABSTRACT

Group work is widely used in educational settings to enhance student collaboration, communication, and critical thinking skills. However, how well learners progress through the various phases of group growth frequently determines its effectiveness. This study explores learners' perceptions of the four stages in group work (forming, storming, norming, and performing) and examines the relationships among these stages. The objective is to understand how learners experience each phase and how these stages relate to one another during group interaction. This quantitative study used a 29-item Likert-scale survey instrument adapted from Tuckman's (1965) model, organised into three main sections. A total of 129 participants from various academic disciplines and both public and private institutions responded to the survey. Findings reveal that learners approach the forming stage with enthusiasm and a structured mindset but face initial challenges, such as trust issues and hesitation in seeking help. The storming stage involves moderate conflict and leadership tension, while the norming stage demonstrates high group cohesion, mutual acceptance, and shared goals. The performing stage is the most positively perceived, marked by enjoyment, productivity, and effective teamwork. Correlation analysis confirms significant positive associations between consecutive stages, reinforcing the sequential and interdependent nature of group development. The study supports established group development theories and highlights the importance of managing group dynamics to enhance learning outcomes. It offers practical implications for educators to design stage-responsive interventions that support student collaboration and success in group-based tasks.

Keywords—Group work, Tuckman's Model, Forming, Storming, Norming, Performing

INTRODUCTION

Background of the Study

Important abilities like collaboration, communication, and critical thinking are essential for achieving exceptional project results in both academic and professional contexts (Dias-Oliveira, Pasion, da Cunha, & Coelho, 2024). Although each individual has their unique capabilities, working in a group can enhance and optimise their potential. It is imperative to understand the development of a team as it progresses through different stages of group work. The five-stage model in Tuckman's framework serves as a good reference to achieve this objective (Tuckman & Jensen, 1977). Members establish the group's goal and get to know one another during the forming stage. The storming stage is a process of exchanging ideas and opinions in a group. This stage might be an intense process since it brings out everyone's personalities, and conflicts are expected to arise. This is followed by the norming stage, which helps the team to find its rhythm and trust, resulting in improved teamwork skills towards shared objectives. Finally, the adjourning stage marks a closure to the group members as they will go their separate ways after the group work has successfully achieved its objectives. Every one of these stages has a unique impact on how a group functions. Studies have mostly been conducted for each stage, and only a few have focused on the connection or transition of each stage. A lack of understanding of these relationships may negatively impact the experience, effectiveness, and group work outcomes.

Statement of Problem

The five sequential stages in Tuckman's Model are widely discussed in theory and application studies across education, psychology, and organisational contexts (Zakaria et al., 2023). However, existing studies tend to focus on the storming and performing stages, analysing the effect of these stages on group success, task conflict, and leadership (Nawi, Nordin, Zabidin, & Sain, 2022). Other studies have reported that ineffective handling during the storming stage leads to rattling the norming process and weakening group cohesion and mutual trust as conflicts within the group are not well managed (Kamarudin et al., 2023). Recent studies have called for future research to focus on the interconnected nature of group development stages and adaptive transition between them (Zakaria et al., 2023). Therefore, this study aims not only to gain insight into and understanding of each individual stage but also to examine the interrelation between the stages in Tuckman's Model. This approach will help inform more effective group facilitation strategies and lead to improved practices in both educational and organisational group settings.

Objective of the Study and Research Questions

The purpose of this study is to investigate how learners perceive the stages of group projects. In particular, the following questions are addressed by this study:

1. How do learners perceive the forming stage in group work?
2. How do learners perceive the storming stage in group work?
3. How do learners perceive the norming stage in group work?
4. How do learners perceive the performing stage in group work?
5. Are the stages of group work related to one another?

LITERATURE REVIEW

Theoretical Framework of the Study

The social constructivist viewpoints of Vygotsky, Isaac, and Bruner serve as the theoretical cornerstone of this investigation, all of whom emphasise the vital role of social interaction in cognitive development. Social Development Theory implies that students derive meaning through discussion and involvement, establishing a causal link between social interaction and individual learning (Vygotsky & Cole, 1978). Isaac (1929) believes that learning is an active and constructive process, in which humans consistently interact with one another and their surroundings to promote development (Isaacs, 1929). Bruner (2009) supported the view that learning is a socially mediated process wherein learners integrate new concepts with pre-existing knowledge (Bruner, 2009). These viewpoints share the fundamental constructivist idea that students actively participate in building up knowledge through engagement, research, and reflection, rather than merely consuming information passively. Collectively, these theories advocate for group interaction to promote critical thinking, mutual understanding, and the co-creation of knowledge within collaborative learning contexts. Particularly, Vygotsky's (1978) Social Constructivist Theory introduces two important concepts in group learning: the More Knowledgeable Other (MKO) and the Zone of Proximal Development (ZPD) (Vygotsky & Cole, 1978). The MKO designates a learner with more knowledge or experience who helps others learn, but the ZPD distinguishes between a learner's potential accomplishments with assistance and their autonomous skills. These concepts manifest in collaborative learning environments where peers assist each other, offer constructive feedback, and work together to understand assignments and solve problems. Language plays a central role in meaning-making, negotiation, and communication. This method strongly supports the use of group activities that promote collaboration, linguistic and cultural involvement, and improved learning through social interactions.

Challenges of Group Work

Despite its prevalent use in conventional and online education, group work often presents its own set of challenges that can limit its effectiveness. One of the most common issues is the unequal participation, where some dominant learners contribute significantly more than others, which further leads to frustration and conflict

among group members (LaBeouf, Griffith, & Roberts, 2016; Roskosa & Rupniece, 2016; Wan Yadri, Ahmad, Abdul Kadar, Nazym, & Mohd Johari, 2024). Such problems often arise when learners are uncertain about their roles within the group, or when there are noticeable variations in their skills and motivation levels (Appavoo, Sukon, Gokhool, & Gooria, 2019; Hasan, Hussain, Malik, & Akhtar, 2023). Additionally, other challenges include poor time management, scheduling conflicts, and ineffective leadership, which can further reduce group efficiency (Shen & Chen, 2023; Tucker & Abbasi, 2016). Furthermore, even with assigned roles, "free-riding" issues like task avoidance and "sucker effect" issues where members reduce their effort due to perceived unfairness can negatively impact group dynamics (Chang & Kang, 2016). Variation in engagement, personality, learning styles, level of motivation, expectations, communicative competence, and participation can also contribute to inconsistent contributions of the group members (Aggrawal, Bosman, & Magana, 2024; Jackson, 2009). Collectively, the challenges presented in this paragraph undermine the effectiveness of group work by affecting fairness, coordination, and individual engagement, ultimately compromising the quality of collaborative work experiences.

Benefits of Group Work

Within both traditional and online learning environments, well-organised group work offers certain educational advantages that go beyond the accomplishment of cooperative assignments. The key benefit of group work can be seen through learners' interaction, where they reinforce their understanding and learning by explaining and sharing their knowledge within their group (Hefter & Berthold, 2020). Group work also enables learners to engage with diverse perspectives, which stimulates their critical thinking and helps to foster more innovative approaches to problem-solving (Kirschner, Sweller, Kirschner, & Zambrano R, 2018; Poort, Jansen, & Hofman, 2019). Additionally, many researchers have found that learners are generally more engaged and retain content more effectively when learning through collaborative methods (Chen & Yang, 2019; Costley, 2021; Qureshi, Khaskheli, Qureshi, Raza, & Yousufi, 2023; Salmons & Wilson, 2023). In addition to imparting knowledge and abilities, group works also foster the development of critical soft skills like time management, communication, and teamwork. All of which are critical for success in the business and academic settings (McKay & Sridharan, 2024; Rajabzadeh, Long, Saini, & Zeadin, 2022; Zheng, Li, Zhang, & Sun, 2019). Furthermore, studies by Alsebaie (2023) and Herman (2022) also highlight that working closely with peers fosters a sense of collective responsibility and mutual encouragement, which can boost learners' confidence and support the development of independent learning habits (Alsebaie, 2023; Herman, 2022). In general, contributing to group work encourages meaningful learning, strengthens both social and professional development of the learners, and nurtures learners to become more self-assured, cooperative, and self-directed in academic and real-world contexts.

Past Studies

Past Studies on the Challenges of Group Work

One effective way to produce high-quality coursework or projects is through group work. However, its success depends on strong group participation and dynamics, allowing for meaningful discussions that foster creativity and innovation. Each group member is expected not only to contribute valuable input but also to collaborate effectively with others to achieve the group's final goals. This statement is supported by Johnson and Johnson (2013), who stated that cooperative learning involves interdependence among learners to encourage and utilize their optimum learning potential to achieve a specific goal (Johnson & Johnson, 2013). However, for every group work to succeed, a few drawbacks must be considered and improved, mainly at every stage of the process. Numerous studies have examined the developmental stages of group work, particularly using Tuckman's (1965) model.

A study conducted by Rick et al. (2022) during the COVID-19 movement control order reported that due to very minimal contact with classmates and lecturers, the students are forced to adapt to the new normal in fulfilling the task in group work (Rick et al., 2022). The sample of 116 respondents from a public university in Malaysia was surveyed using a Google Form at the end of the semester, and the data were analysed using SPSS. They found out that the presence of an instructor is crucial during the forming stage of group work. This might be due to the initial limited contact between the group members and the need for someone to initiate the formation of the group. In the subsequent stage, storming, norming, and performing, they found out that the communication

and collaboration within the group had a positive impact on group work. They also suggested that future research could investigate teachers' perspectives on online group work and include participants from cross-faculty clusters. Besides, the learners' perceptions could be explored through qualitative methods to gain deeper insights. Yean et al. (2024) conducted a study to examine the effectiveness of group work in the context of conflict during the process of learning the Japanese language (Yean, Sarif, Ahmad, & Er, 2024). The study involved a sample of 112 students from a public university in Malaysia. Participants were asked to complete a Google Form consisting of four sections, including a demographic profile and 29 items rated on a five-point Likert scale. The findings indicated that the conflict can be resolved by effective leadership, constructive communication, and shared agreement on goals with the help of the instructor during the norming stage, as they believe this will have a successful progression to achieve the high-performing stage. They further recommended that future studies examine common sources of conflict during the group formation stage and develop effective strategies for conflict resolution. The transitions between each stage of group development deserve careful attention, as they significantly influence how team members perceive their overall experience. When these transitions are well-managed, they can lead to a sense of accomplishment and closure during the adjourning stage, with team members feeling that they have given their best and have no regrets. Moreover, a deeper understanding of the interconnections between each stage can serve as a valuable reference or benchmark for future group work practices, contributing to more cohesive and effective teamwork in both educational and professional contexts.

Past Studies on the Benefits of Group Work

Numerous studies have explored students' perceptions of group projects or collaborative learning, particularly regarding their influence on skill development. For instance, Tanaka (2022) examined the effects of the group work environment, especially group engagement and cohesion, on motivation and achievement among 200 Japanese university students enrolled in a project-based English course (Tanaka, 2022). The study employed tests, grade analysis, and questionnaires to assess outcomes and found that a supportive group environment significantly enhanced intrinsic motivation while reducing amotivation. Notably, the study found that group engagement had a greater impact on motivation than cohesion alone, regardless of students' English proficiency levels. According to the study, to maximise learning outcomes, teachers should actively encourage student participation in group projects in addition to fostering group cohesion. Supporting these findings, Park et al. (2021) investigated group work and active learning across 25 STEM courses at a large public university with 4,257 undergraduate students (Park et al., 2021). According to their research, it is revealed that students' negative perceptions of learning and task value are considerably decreased when teachers effectively facilitate group work by outlining tasks, promoting participation, and giving prompt feedback. Students who receive this kind of facilitation felt more involved, were more motivated to interact with the content, and were able to evaluate their learning more accurately. Ashikullah et al. (2024) concentrated on how group projects can improve student engagement, creativity, and communication (Ashikullah, Al-Amin, Tanisha, Islam, & Prodhan, 2024). According to 200 students' questionnaire responses, the study discovered that group work enabled students to develop new perspectives, enhance their communication abilities, and generate more original ideas, all of which led to deeper learning compared to individual work. Similarly, Burayk (2022) assessed the knowledge, abilities, attitudes, and performance of 335 nursing, computer science, and accounting students in small group instruction (Burayk, 2022). According to the study, the results indicated generally positive attitudes toward small group learning. They acknowledged the advantages of active participation, idea sharing, critical thinking, problem-solving, communication, and peer learning. Presentations, role plays, case studies, simulations, and problem-based learning were among the most frequently utilised group activities. Taken together, these studies collectively suggest that group work is more than just dividing students into teams. Group work requires purposeful instructional design, supportive learning environments, and active engagement to be effective. They demonstrate that effective group work fosters the development of crucial skills such as communication, creativity, and critical thinking. The educators should move beyond simply assigning group tasks and instead establish structured frameworks that promote positive group dynamics, clear roles, and meaningful interaction. This approach not only enhances academic outcomes but also prepares students for real-world collaboration.

Conceptual Framework of the Study

The use of group work as part of classroom activities is beneficial in many ways. Vygotsky (1978) emphasised

the importance of social interaction in learning (Vygotsky & Cole, 1978). Group work does more than just share responsibilities in the class. Learners gain knowledge as well as improve their communication skills (Rahmat, 2020). This study examines the connections between each stage of group work (see Fig. 1).

Tuckman (1965) proposed that learners progress through several distinct stages during group interaction (Tuckman, 1965). The initial phase of group development, known as the forming stage, involves team members getting to know one another and beginning to establish relationships. Following the forming stage, the group enters the storming stage, during which team members brainstorm ideas for the task given. Following this, the group enters the norming phase, during which time they collaborate to finish the assignment. The final stage, known as the performing stage, is when the team finishes the project and is ready to show their work for evaluation.

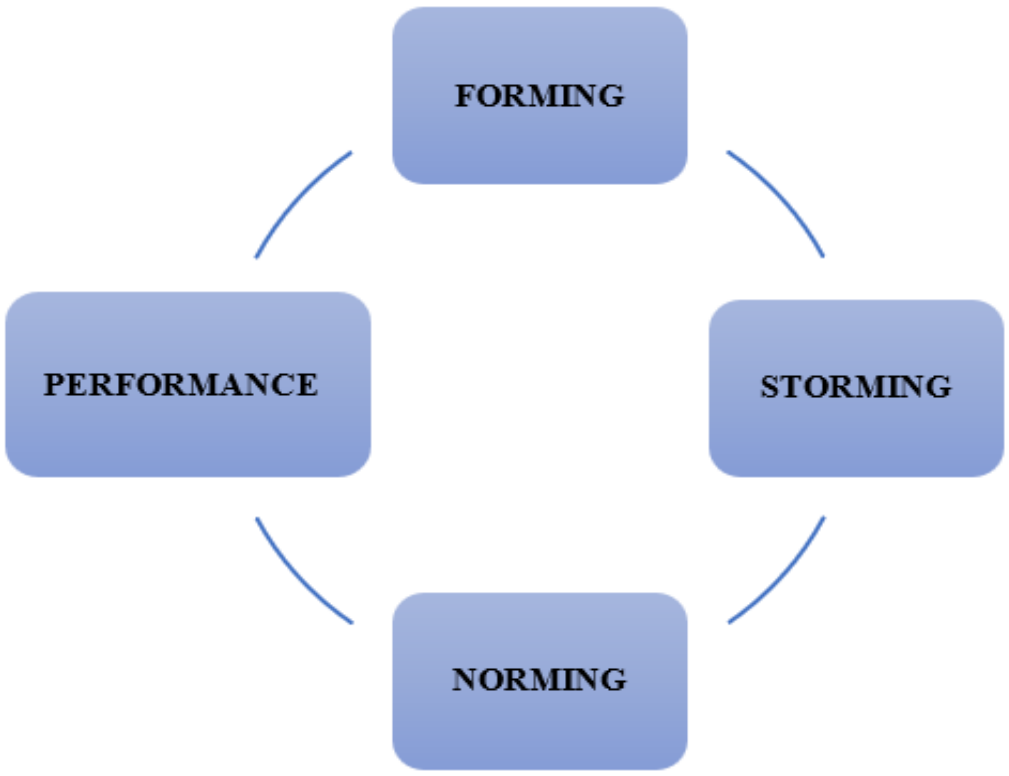


Fig. 1 Conceptual Framework of the Study

Relationships of all Stages in Group Work

METHODOLOGY

The purpose of this quantitative study was to investigate group work interaction at every stage. The survey received responses from 129 participants in a convenience sample. The variables in Table 3 below were revealed using a 5 Likert-scale survey (Table 2), which was duplicated from Tuckman (1965). Table 1 below outlines the categories used for the Likert scale; 1 represents “Almost never”, 2 “Seldom”, 3 “Occasionally”, 4 “Frequently”, and 5 “Almost Always”.

Table I Likert Scale Use

1	Almost Never
2	Seldom
3	Occasionally

4	Frequently
5	Almost always

Table 2 Distribution Of Items In The Survey

SECTION	STAGE	Items	Cronbach Alpha
B	FORMING	7	.726
C	STORMING	6	.779
D	NORMING	8	.756
E	PERFORMING	8	.865
	TOTAL ITEMS	29	.900

The survey's dependability is also displayed in Table 2. For the Forming stage, the Cronbach alpha is .726; for the Storming stage, it is .779; for the Norming stage, it is .756; and for the Performing stage, it is .865. The total Cronbach Alpha for all 29 elements is .900, indicating that the instrument is very reliable (Jackson, 2009). To present the findings and address the research objectives for this study, additional analysis was carried out using SPSS.

FINDINGS

Demographic Analysis

The demographic profile of the respondents is shown in this part, along with a number other important detail. Females made up the remaining 33% of the population, with male making up the majority (67%). Regarding academic discipline, students from Social Sciences and Business represented the larger group at 61%, whereas those from Science and Technology constituted 39%. When examining the type of institution, there was a relatively balanced distribution: 52% of the respondents were from public institutions (IPTA), and 48% were from private institutions (IPTS). The vast majority of participants (92%) were between the ages of 18 and 21, with only 8% falling between the ages of 22 and 25. These findings indicate that the respondent pool was predominantly young males, mostly studying social sciences or business, and attending a nearly even mix of public and private institutions.

Table 3 Percentage for Demographic Profile

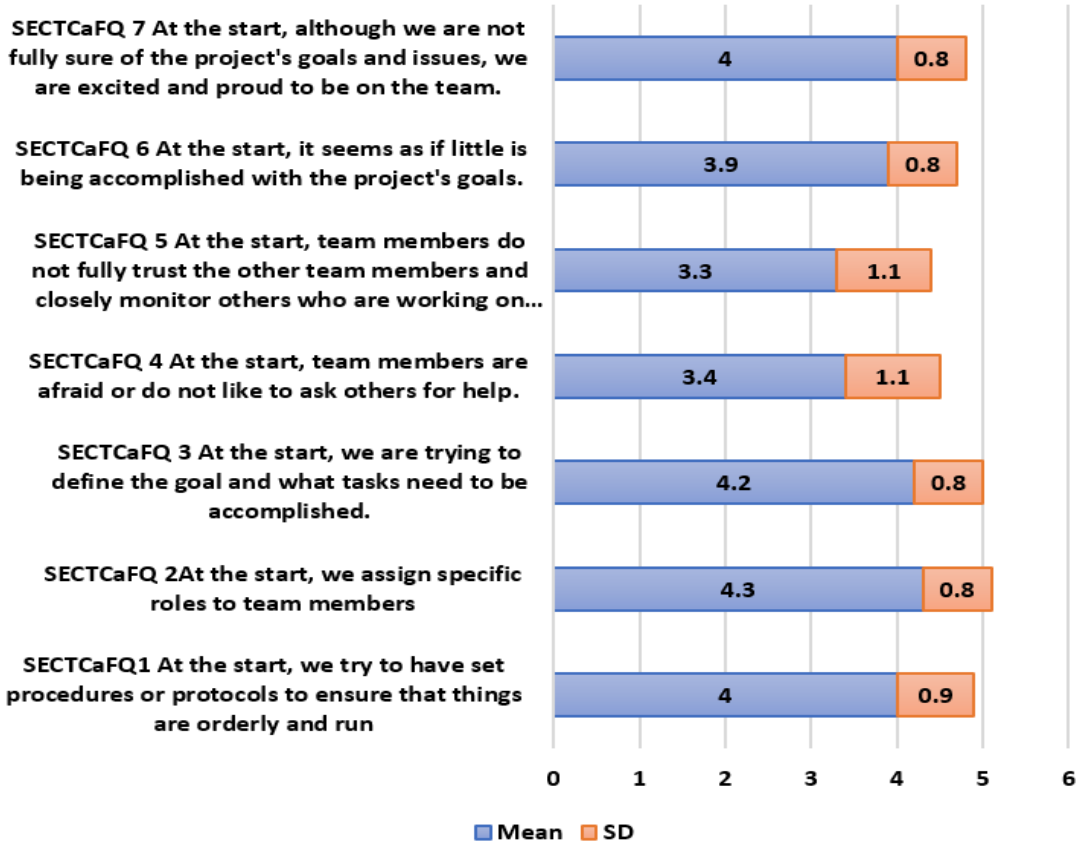
Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	67%
		Female	33%
2	Discipline	Science & Technology	39%
		Social Sciences & Business	61%
3	Institution	IPTA	52%
		IPTS	48%

4	Age	18-21 years	92%
		22-25 years	8%

Descriptive Statistics

Findings for the Forming Stage

This section provides information to address Research Question 1: How do learners perceive the forming stage in group work?



Mean Scores for the Forming Stage

The results show that learners in general approach the forming stage with a strong sense of structure and a high level of motivation. Among the items, the assignment of specific roles to team members yielded the highest mean score (M = 4.3, SD = 0.8), followed by efforts to define group goals and tasks (M = 4.2, SD = 0.8) and establishing procedures or protocols to ensure order (M = 4.0, SD = 0.9). Despite their initial reservations, learners also showed pride and joy about joining the team (M = 4.0, SD = 0.8), suggesting good emotional engagement early in the group process. However, some challenges were noted, including perceptions of limited early progress (M = 3.9, SD = 0.8), hesitation to ask for help (M = 3.4, SD = 1.1), and a lack of initial trust among members (M = 3.3, SD = 1.1), where team members reportedly monitor one another closely. The higher standard deviations for these items suggest variability in learners' experiences, particularly in aspects related to communication and trust. Overall, the results suggest that while learners begin group work with motivation and a structured approach, they also encounter common interpersonal challenges typical of the forming stage, which may require targeted support to foster a more cohesive and trusting group environment.

Findings for the Storming Stage

This section presents findings related to Research Question 2 – How do learners perceive the storming stage in group work?

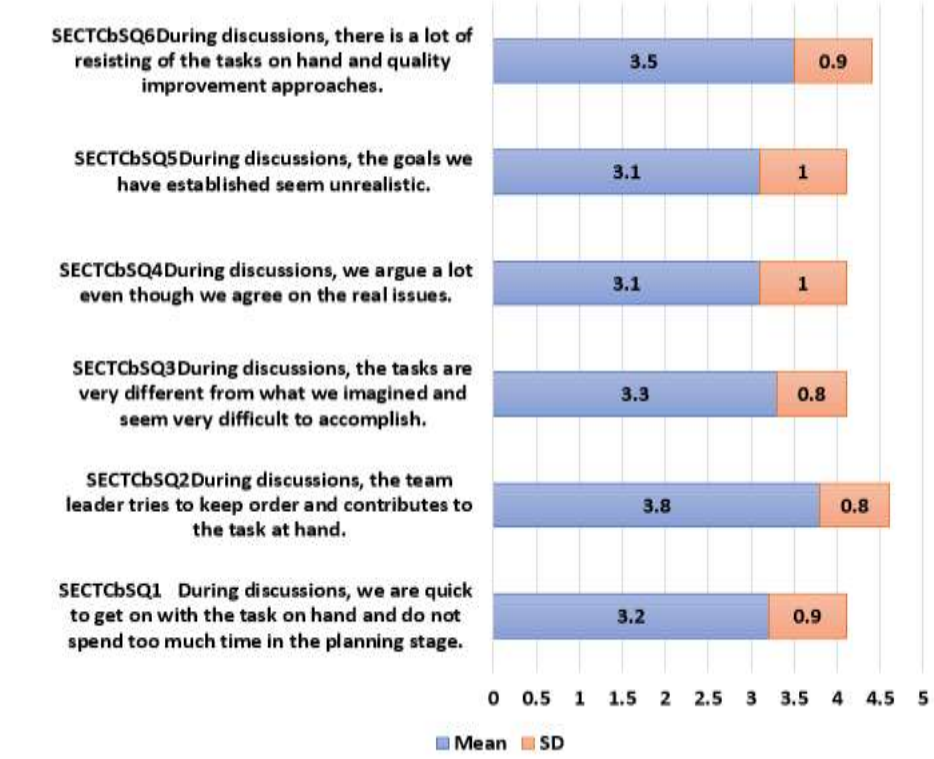


Fig. 3 Mean Scores for the Storming Stage

Fig. 3 above reveals the mean values for items related to the storming stage. The highest mean was recorded for Item 2 (M=3.8, SD=0.8), which describes the team leader's efforts to take initiative during discussions while also contributing to the assigned task. This suggests that learners recognised leadership as a key factor during this stage. The next highest score was recorded for Item 6 (M=3.4, SD= 0.9), which reflects that group discussions often involved resistance to tasks as well as efforts toward improving quality. A mean score of 3.1 was observed for two separate items. The first is Item 4 (M=3.1, SD=1.0), which suggests that while team members often engaged in arguments during discussions, they generally reached agreement on the core issues. The next item is item 5 (M=3.1, SD=1.0,) which states that during discussions, the goals that the team has established could seem unrealistic.

Findings for the Norming Stage

This section provides data addressing Research Question 3: How do learners perceive the norming stage in group work?

In Fig. 4, the norming stage experienced while doing group work is being assessed through eight indicators, focusing on the planning process, team goals and objectives, team harmony and acceptance, and interpersonal dynamics. The results show that the learners generally experienced a positive group dynamic as reflected by mean scores ranging from 3.2 to 4.2 across the items. For SECTCcNQ1 and SECTCcNQ2, the mean score of 3.9 and 4.0 suggests that most group members can agree on the team's objectives and shared understanding of each task when working in a group. For the next three indicators, SECTCcNQ3, SECTCcNQ4, and SECTCcNQ5 recorded mean scores between 4.1 and 4.2, indicating a very good group dynamic between the leaders and group members. They can accept each other as a crucial member of the team and have good team harmony while doing group activities. Due to the strong interpersonal relationships within the team, members are often inclined to revisit the original scope of the project. However, some challenges were noted. A lower mean value of 3.6 in SECTCcNQ6, possibly due to discomfort among some members when the team deviated from the original project scope. Similarly, the low mean value from this result is reflected in SECTCcNQ7 and SECTCcNQ8, which range from 3.2 to 3.4. This value indicates that the exchange of constructive criticism is happening between group members and able to share personal problems within the group. The standard deviation for all items is quite low, ranging from 0.7 to 1.2, making the result reliable and consistent.

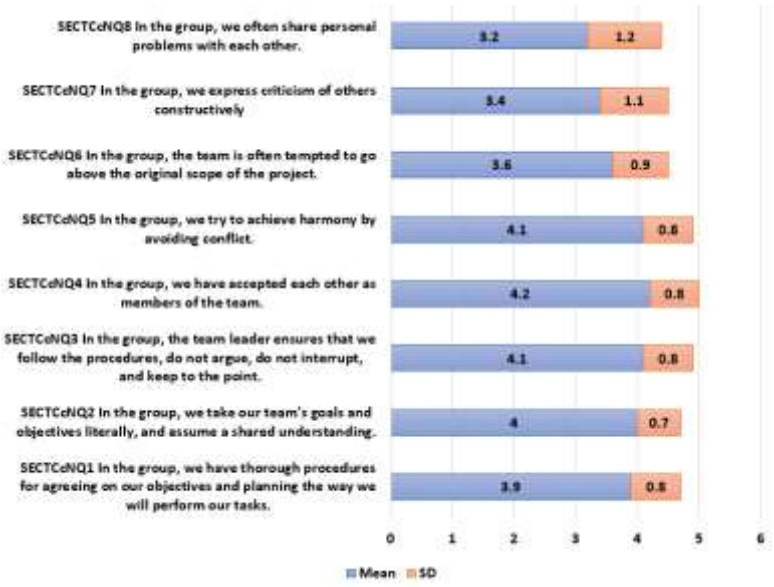


Fig. 4 Mean Scores for the Norming Stage

Findings for the Performing Stage

The data presented in this section are in response to Research Question 4: How do learners perceive the performing stage in group work?

The findings for the Performing stage are illustrated in Fig. 5 above, which generally indicate positive perceptions of group collaboration among learners. The highest mean scores of 4.3 (SD = 0.8) were recorded for SECTCdPQ3 and SECTCdPQ8, indicating that participants viewed their group work as both enjoyable and efficient. Similarly, strong agreement was observed on items reflecting mutual respect, effective problem-solving, and reinforced ownership and teamwork. For instance, SECTCdPQ5 scored a mean of 4.2 (SD = 0.8), while SECTCdPQ6 and SECTCdPQ1 each scored 4.1. Meanwhile, the lowest mean score was recorded for SECTCdPQ2 at 3.6 (SD = 0.9), suggesting that while teams were productive, there is still flexibility in team processes. Additionally, perceptions of democratic leadership (SECTCdPQ4, M=3.9; SD=0.8) and team attachment (SECTCdPQ7, M=4.0; SD=0.8) further support the view of a generally collaborative and engaged environment. Overall, score ranges between 3.6 and 4.3 reflect cohesive reinforcement by the Performing stage, at which the learners typically experience a supportive and effective group work dynamic.

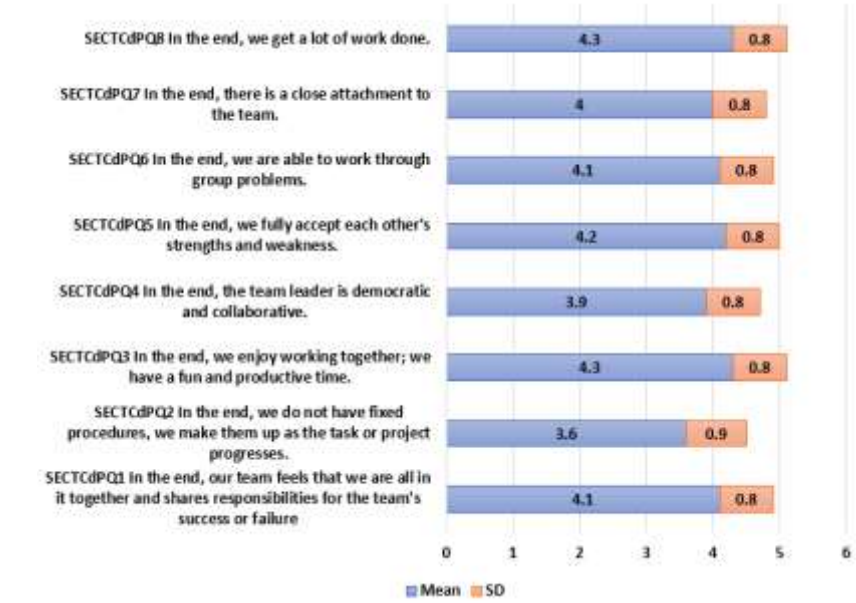


Fig. 5 Mean Scores for the Performing Stage

Exploratory Statistics

The Findings for the Relationship between stages in group work.

This section presents data to answer research question 5: Are the stages of group work related to one another?

To examine whether there is a significant relationship between the mean scores across different stages of group work, a correlation analysis was conducted using SPSS. The findings are detailed separately in Tables 4, 5, 6, and 7 below.

TABLE 4 Correlation between Forming and Storming Stage

		FORMING	**STORMING**
FORMING	Pearson (Correlation)	1	.377**
	Sig (2-tailed)		.000
	N	129	129
STORMING	Pearson (Correlation)	.377**	1
	Sig (2-tailed)	.000	
	N	129	129

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

Table 4 indicates a statistically significant but low correlation between the forming and storming stages, with a correlation coefficient of r=.377** and a p-value of p=.000. According to Jackson (2015), the correlation coefficient is considered statistically significant at the .05 level, and positive correlations are measured on a scale of 0.1 to 1.0. Values between 0.1 to 0.3 indicate a weak positive correlation, 0.3 to 0.5 suggest a moderate positive correlation, and values from 0.5 to 1.0 reflect a strong positive correlation. These findings suggest a weak positive association between forming and storming stages.

As shown in Table 5, there is a statistically significant association between storming and the norming stages. Correlation analysis shows that there is a strong, significant association between storming and norming stage (r=.566**) and (p=.000). According to Jackson (2015), the correlation coefficient is considered statistically significant at the .05 level, and positive correlations are measured on a scale of 0.1 to 1.0. Values between 0.1 to 0.3 indicate a weak positive correlation, 0.3 to 0.5 suggest a moderate positive correlation, and values from 0.5 to 1.0 reflect a strong positive correlation. This suggests that there is also a strong positive relationship between the storming and norming stages.

TABLE 5 Correlation between Storming and norming Stage

		STORMING	**NORMING**
STORMING	Pearson (Correlation)	1	.566**
	Sig (2-tailed)		.000
	N	129	129
NORMING	Pearson (Correlation)	.566**	1

	Sig (2-tailed)	.000	
	N	129	129

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

Table 6 Correlation Between Norming and Performing Stage

		NORMING	**PERFORMING**
NORMING	Pearson (Correlation)	1	.636**
	Sig (2-tailed)		.000
	N	129	129
PERFORMING	Pearson (Correlation)	.636**	1
	Sig (2-tailed)	.000	
	N	129	129

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

Table 6 illustrates a correlation between the norming and performing stages. Correlation analysis shows a strong, significant association between the norming and performing stages (r=.636**) and (p=.000). According to Jackson (2015), the correlation coefficient is considered statistically significant at the .05 level, and positive correlations are measured on a scale of 0.1 to 1.0. Values between 0.1 to 0.3 indicate a weak positive correlation, 0.3 to 0.5 suggest a moderate positive correlation, and values from 0.5 to 1.0 reflect a strong positive correlation. This indicates a strong positive relationship between the norming and performing stages.

TABLE 7 Correlation between Performing and forming Stage

		PERFORMING	**FORMING**
PERFORMING	Pearson (Correlation)	1	.500**
	Sig (2-tailed)		.000
	N	129	129
NORMING	Pearson (Correlation)	.500**	1
	Sig (2-tailed)	.000	
	N	129	129

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

Table 7 highlights a relationship between the performing and norming stages. Based on the correlation analysis, it shows that there is a high significant association between the performing and norming stages (r=.500**) and (p=.000). According to Jackson (2015), the correlation coefficient is considered statistically significant at the .05 level, and positive correlations are measured on a scale of 0.1 to 1.0. Values between 0.1 to 0.3 indicate a weak positive correlation, 0.3 to 0.5 suggest a moderate positive correlation, and values from 0.5 to 1.0 reflect a

strong positive correlation. This reflects a strong positive relationship between the performing and norming stages.

CONCLUSIONS

Summary of Findings and Discussions

This study sought to examine learners' perceptions of the various phases of group work, namely forming, storming, norming, and performing, and to analyze the interrelationships between these stages. The forming stage was generally viewed positively, with learners showing enthusiasm and a structured approach through role assignment and goal setting. This aligns with Tuckman's (1965) description of the forming stage, where group members get acquainted and establish the groundwork for collaboration. However, challenges such as limited early trust and hesitation to seek help were also evident, echoing previous research highlighting interpersonal uncertainty during early group interactions (Wan Yadri et al., 2024). The importance of instructor presence during this phase was particularly emphasised in recent findings by Rick et al. (2022), who observed that minimal initial contact, especially in online or remote learning contexts, can hamper group formation without proper facilitation (Rick et al., 2022).

The storming stage revealed moderate levels of conflict and resistance, particularly regarding leadership and task management. Disagreements and unrealistic expectations mirrored Tuckman's depiction of storming as a period of negotiation and conflict resolution. This was further supported by Yean et al. (2024), whose study on language learners found that group conflicts, when addressed through positive communication and effective leadership, often with instructor support, can lead to better norming outcomes (Yean et al., 2024). Similarly, prior studies have affirmed that power struggles and resistance are common but resolvable with the right support structures (Appavoo et al., 2019; Roskosa & Rupniece, 2016).

Learners' perceptions of the norming stage were largely positive, with learners reporting team harmony, shared objectives, and mutual acceptance. This reflected strong group cohesion and aligned with existing literature (Kirschner et al., 2018; Poort et al., 2019). Yet, discomfort with the original project scope and limited constructive feedback exchange point to areas for communication improvement, consistent with Hasan (2023) and Chang & Kang (2016) (Chang & Kang, 2016; Hasan et al., 2023). Yean et al. (2024) further noted that this stage is critical in consolidating group unity and resolving earlier tensions, especially when instructors mediate group norms and task clarity (Yean et al., 2024).

The performing stage was perceived most positively, marked by productive collaboration, mutual respect, and shared responsibility. These findings corroborate prior model by Tuckman (1965) and studies by Hefter & Berthold (2020), suggesting that groups in the performing phase operate efficiently and with strong cooperation (Hefter & Berthold, 2020; Tuckman, 1965). Although procedural flexibility scored slightly lower, this aligns with Shen & Chen (2023), who emphasized that some adaptability is necessary for effective problem-solving and responsiveness to change (Shen & Chen, 2023).

Correlation analyses revealed significant positive relationships between consecutive group work stages, especially between storming, norming, and performing. This affirms the sequential and interdependent nature of Tuckman's model, where successful navigation of earlier stages supports stronger functioning in later ones. Rick et al. (2022) highlighted that the transitions between stages, especially in online settings, require instructors' scaffolding to maintain continuity and group momentum (Rick et al., 2022). While this study reaffirmed Tuckman's framework, it also highlighted that real-world group work experiences are nuanced and shaped by context, instructor facilitation, and individual engagement. Despite challenges like unequal participation and conflict, group work enhances communication, collaboration, and learning outcomes, aligning with the socio-cultural theory of learning by Vygotsky (1978) and findings by Rahmat (2020) and Zheng et al. (2019) (Rahmat, 2020; Vygotsky & Cole, 1978; Zheng et al., 2019).

Moreover, the findings are consistent with broader literature showing that well-structured group work boosts intrinsic motivation, creativity, and critical thinking. For instance, Tanaka (2022) and Ashikullah et al. (2024) found that supportive and engaging group environments significantly enhance motivation, innovation, and

communication. Similarly, Park et al. (2021) emphasized the role of instructor guidance in improving student perceptions and participation. These studies underscore that group work, when designed with purposeful structure and support, goes beyond task completion and contributes to meaningful, long-term skill development and academic success. In conclusion, understanding the dynamics and transitions between group work stages not only informs theoretical models but also provides practical insights for educators seeking to foster effective collaboration. Facilitating these stages intentionally, especially forming and storming, can lead to more cohesive teamwork and better learning experiences for all members.

Implications and Suggestions for Future Research

Theoretical and Conceptual Implications

The findings of this study contribute significantly to the theoretical and conceptual understanding of collaborative learning, particularly within the social constructivist framework. As outlined in Section 2.1, this study is grounded in the ideas of Vygotsky, Piaget, and Bruner, who all emphasize that knowledge construction is most effective when it occurs through meaningful social interaction. The results of this study affirm these perspectives by demonstrating that group work, when structured and supported effectively, can facilitate cognitive development through peer collaboration, reflection, and negotiation. Vygotsky's theory emphasizes the Zone of Proximal Development (ZPD), highlighting the importance of guidance provided by a More Knowledgeable Other (MKO) was particularly evident in the norming and performing stages of group work, where learners helped one another clarify tasks, offer constructive feedback, and co-construct knowledge. These interactions reflect the kind of socially mediated learning environments described in the theoretical framework, where learners can achieve more through collaborative support than they could independently.

Additionally, the study reinforces the conceptual framework presented in Section 2.3, which draws on Tuckman's (1965) group development model. The analysis confirmed that learners indeed perceive group development as progressing through the forming, storming, norming, and performing stages. More importantly, the correlation findings suggest that each stage has a significant influence on the subsequent one, supporting the idea of a sequential and interdependent process. However, the challenges reported during the storming and norming stages, such as conflict, unclear roles, and lack of feedback, indicate that group development is not strictly linear. Rather, these results imply that group dynamics are dynamic and impacted by external elements, including technology settings, group diversity, and the availability or lack of instructional support. Thus, this study contributes to a more nuanced understanding of group development models by advocating for a flexible, context-sensitive approach. It suggests that theoretical models of group work should incorporate non-linear progression, dynamic role negotiation, and the importance of external scaffolding, such as instructor facilitation. In doing so, the findings bridge classical developmental models and modern collaborative learning environments.

Pedagogical Implications

The outcomes of this research offer practical and timely pedagogical implications for educators aiming to implement group work more effectively in both traditional and online classrooms. One significant finding is that effective group performance is strongly shaped by the quality of interactions during the initial stages, especially forming and storming. While the performing stage was rated most positively, the difficulties encountered during storming and norming, including interpersonal tensions, role ambiguity, and uneven contributions, highlight the need for more intentional teaching strategies. Educators should not assume that learners naturally understand how to collaborate effectively. Instead, they should provide explicit instruction on group roles, communication norms, and conflict resolution techniques during the forming stage. As the group progresses, instructors should continue to observe and intervene when necessary, especially during the storming phase, where tensions are likely to arise. Facilitators must be proactive in managing group dynamics and ensuring that all learners are engaged and contributing fairly. Moreover, the role of the instructor as a scaffold or facilitator, as conceptualized by Vygotsky's MKO, should be emphasized throughout the group process. Particularly in online or hybrid environments, where social cues are limited, instructor presence can help sustain motivation, clarify expectations, and mediate conflicts. Strategies such as peer evaluations, self-reflection tasks, and regular group check-ins can further support accountability and communication. In addition, group work should not be treated

merely as an assessment tool, but rather as a developmental process that fosters transferable skills such as leadership, teamwork, and critical thinking. Embedding structured group activities within the curriculum, aligned with clear learning outcomes and supported by continuous feedback, can transform group work into a powerful pedagogical strategy. The findings of this study encourage educators to adopt a more structured, responsive, and student-centered approach to designing and facilitating group tasks. By doing so, group work can be a more meaningful and effective component of the learning experience, promoting both academic achievement and personal growth.

Suggestions for Future Research

While this study provides valuable insights into learners' perceptions of group development stages, several areas warrant further exploration to build a more comprehensive understanding of group work in higher education contexts. One key recommendation is to investigate the perspectives of instructors, particularly regarding their role in facilitating group development. As noted in Rick et al. (2022), instructor presence is vital during the early stages of group formation, especially in online learning environments (Rick et al., 2022). Understanding how educators perceive and manage group dynamics can complement student-focused research and inform professional development practices. Furthermore, future research could explore the nature of conflict and resolution in greater depth. Although this study identified conflict during the storming phase, qualitative studies using interviews or focus groups could uncover the underlying causes of disagreements and reveal effective resolution strategies from learners' perspectives. There is also a need to conduct cross-disciplinary and cross-cultural studies to determine how group dynamics vary across academic fields and learner backgrounds. This is particularly relevant in multicultural educational settings where communication styles, values, and learning expectations may differ significantly. In addition, with the rise of digital learning environments, future studies should investigate how online platforms and collaborative technologies shape group interactions, engagement, and outcomes. This includes examining how tools such as Google Docs, learning management systems, or video conferencing apps facilitate or hinder collaboration across the group stages. Lastly, researchers should consider the role of individual learner differences, such as personality traits, communication preferences, motivation levels, and prior experience with group work. These variables may influence how learners engage in different group stages and respond to conflict, feedback, and task demands. Continued investigation in these areas allows scholars to construct a richer, more context-sensitive perspective on how group work functions as both a social and pedagogical process, ultimately improving instructional design and student outcomes in collaborative learning environments.

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