THE IMPACT OF GROUP WORK STAGES ON TEAM COLLABORATION: ANALYZING TUCKMAN'S MODEL

Nor Syamimi Iliani Che Hassan [1] *
Nor Hairunnisa Mohammad Nor [2]

[1] Akademi Pengajian Bahasa, Universiti Teknologi MARA Cawangan Kelantan Kampus Machang;
(Email: syami@uitm.edu.my)
[2] Akademi Pengajian Bahasa, Universiti Teknologi MARA Cawangan Kelantan Kampus Machang;
(Email: nisa032@uitm.edu.my)
*Correspondence: nisa032@uitm.edu.my; 0148410737.

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Abstract: *Group work is widely employed as a learning method across all educational levels as it encourages individuals to collaborate on completing assigned tasks. Although its benefits have been extensively documented in numerous studies, research also highlights the challenges associated with group work. To better understand effective group work strategies, Tuckman's model, a well-known team development model is further examined. This study aims to explore the stages of Tuckman's model in the context of team collaboration. Data were collected using questionnaires, distributed to 105 students from various study programs at a public higher learning institution in Malaysia. The descriptive analysis of the quantitative data reveals that the participants demonstrate significant levels of team collaboration across the four stages of Tuckman's model: forming, storming, norming and performing. The result too indicates that as the group work progresses, the group members manage to overcome the internal conflicts between them and as they move on from one stage to another, the students believe that they have successfully accomplished the assigned tasks once they reach the final stage of group work. Hence, group work facilitates task completion through effective peer support, and this strategy should be integrated into teaching and learning, simultaneously, instructors should offer guidance to help learners achieve high levels of productive team collaboration.*

Keywords: *group work, Tuckman's Model, collaboration.*

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Introduction

Background of Study

Group work is not a new practice in the educational setting. It has been frequently administered by educators to increase students' efficiency and to motivate students to learn from each other as they practice cooperative learning. By working as a group, students take part in exchanging ideas, solving problems, enhancing understanding and overcoming differences which will lead to increased motivation (Chiriac, 2014). Furthermore, group work can serve as one of the solutions to problems and difficulties that students face in their learning processes such as completing tasks, assignments and research projects (Burdett, 2003). Students will not gain these skills if they work individually and independently.

In the 21st century, group work is still implemented in the teaching and learning processes. With the availability of numerous online communication applications for video conferencing such as Google Meet, Microsoft Teams, Webex and Zoom, the potential of group work to facilitate students' learning processes is much better (Kwan & Yunus, 2015). By utilizing these applications which encourage better social aspect such as interpersonal relationships and communication, students can participate more actively in their group work activities (Kwan & Yunus, 2015).

In Malaysian educational setting, group work is included as part of the course syllabus. For example, students are required to form a group to conduct speaking activities and research projects for which one of the evaluation components takes into account students' participation and contribution as a group member which manifest in the negotiation, persuasion, problem-solving and conflict-resolution stages (Omar et al., 2018). The skills will help increase students' emotional intelligence as they learn to convey their emotions wisely.

Therefore, group work is not an obsolete practice in academia as it is always progressing and becomes more efficient because students of the present generation have more options of communication platforms. Group work is no longer restricted to face-to-face communication because it has now been replaced with online communication tools accessible via computers and mobile devices.

Statement of Problem

Group work is a vital component in both educational and professional settings. Its effectiveness stems from enabling learners to revise and complete tasks with the support of their peers (Sokman et al., 2023). The advantages of group work extend beyond the classroom, as employers also seek future employees with strong teamwork skills, which can be cultivated during higher education (Burke, 2011). Interaction and cooperation in group work has proven tremendous success in higher education as learners achieved significantly better in terms of conceptual understanding (Linton et al, 2014). In another study by Chiriac (2014), it is found that learners gain more knowledge when working in groups compared to working individually. Group work does not only enhance academic learning but it also provides insights into group dynamics, individual roles and how others contribute to the group. Despite all of these benefits, many students exhibit the phenomenon known as 'grouphate' where they react negatively to the idea of participating in group work for various reasons. Sorenson (1981) describes grouphate as the aversion and dread people feel towards group activities. For effective group work to take place, this phenomenon should not be neglected. Tuckman's model (1965), proposes four stages in group work comprising forming, storming, norming and performing

stage. This research aims to closely examine the interactions within these four stages to address group dynamics and its influence on group work activities.

Literature Review

Group Interaction and Stages in Group Work

In the context of second language acquisition, it is imperative for language learners to engage with one another as this interaction enhances the overall teaching and learning experiences (Khan, 2009). To facilitate this interaction, group work is a widely used teaching method incorporated into lessons. According to Chiriac (2014), group work is collaborative learning where students collaborate to complete assignments, projects or class activities and as outlined in Tuckman's Model (1965), group work involves four stages known as forming, storming, norming and performing. This model is commonly employed to study group development and also group dynamics (Kim et al., 2022). It emphasizes how a group approaches a task from its formation to its completion. Initially, in the first stage - forming stage, there will be group orientation and learners will try to get acquainted with the group members. The storming stage follows, characterized by the emergence of individual personalities, conflict, and competition, making it the most challenging phase. Next, in the norming stage, conflict is resolved and a sense of unity emerges. Lastly, the performing stage, the group achieves consensus and cooperation, making it more organized in managing the task.

Past Studies on Interaction in Group Work

Group work has become a key strategy in reformed classrooms. In this approach, learners collaborate in groups to answer questions and solve problems during class. The effectiveness of this method in enhancing student learning is highlighted in a study by Linton et al. (2014), which found that students who participated in cooperative group activities significantly outperformed those who work independently. However, the study also indicates that the advantages of peer interaction in group work are most evident in higher-order tasks. The study's findings show that more thorough answers were provided by students in the cooperative groups, suggesting that peer interactions, rather than the activities themselves, are crucial in enhancing student understanding. Consequently, the study concludes that for active learning to be effective, peer interaction and instructor-facilitated explanations are essential components.

In another study conducted by Habali et al. (2024) involving 127 research participants, it is found that group work helps to facilitate studies as it supports effective studying and task completion through peer assistance. Group work unites learners as they are able to communicate and discuss from various perspectives. This is first initiated through group members' selection process until the final stage of the process where they learn to harmonize with each other's views. Therefore, all of these processes are not only valuable for classroom engagement but also encourage interactions, formation of new friendships and group problem solving.

However, not all interactions are harmonious as some may result in conflicts. Group conflicts may always occur and can negatively impact the group's productivity if not immediately addressed (Rahmat, 2020). In Rahmat's study involving 164 participants, the findings indicated that learners acknowledged the need to listen to different opinions in group settings and felt the pressure to persuade others to accept their views. Nevertheless, over time, they learnt to accommodate their group members. This suggests that the participants strive to prevent further disagreements, demonstrating that successful collaboration requires more than just interaction.

Hence, it can be concluded that group work helps individuals gain both knowledge and skills in negotiation and compromise.

Given the growing use of group work in educational settings, along with its associated benefits and challenges, Adesina et al. (2022) propose further research to explore how group work enhances learning experiences. Thus, this study is designed to further understand the challenges and benefits of group work in learning contexts through the framework of Tuckman's Model.

Conceptual Framework

The conceptual framework of the study which is rooted from Tuckman's (1965; 2016) stages in group work is shown in Figure 1. The initial stage begins with forming at which all group members meet, introduce themselves to one another and ask various questions which makes everyone feel excited. The group leader's role is important at this stage because s/he needs to explain about the group's structure, direction and goals and give clear instructions to the group members. Here, the group members also need to determine their roles and responsibilities before moving on to the next stage.

The second stage, storming, involves task organization in order to move towards achieving the goals. At the same time interpersonal conflicts may arise between group members as they might have disagreements about their group's objectives, individual roles and responsibilities, and progression of their group towards their goals. These conflicts will cause feelings of disappointment and anger within the group. If the group members have difficulties in accomplishing the goals, the group leader can play his/her role here by breaking down these into smaller, more achievable goals.

The next stage is norming at which the group members manage to resolve their conflicts and begin to work collaboratively again. They can now accept everyone's ideas despite their differences, express their opinions openly and comfortably, and offer constructive criticisms. The communication is more harmonious compared to the previous stage which will lead to positive and productive progression of the group. At some points, leadership style may also shift from solo to shared leadership.

The fourth stage is performing. At this stage, group members achieve satisfaction with their group's development which makes them become more confident in each other's capabilities to contribute to achieving their goals. They also have greater attachment to their group and group members because their differences are valued. The group members are now more committed to enhance their knowledge and skills, and advance towards greater development of their group. Their group's success and accomplishments are also celebrated.
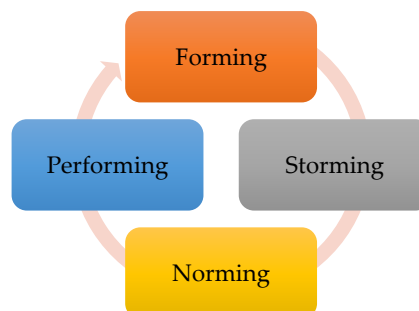
Figure 1: Relationship of the stages in group work.

Method & Material

This quantitative study was conducted to explore interaction among group work members. Convenient sampling was adopted in this study hence, 105 undergraduate students at a Malaysian public university participated. The instrument used was a 5 Likert-scale survey based on Tuckman (1965, 2016) which consisted of four sections: Section A inquired information about respondents' demographic profile. Section B consisted of seven items regarding the forming stage, section C consisted of six items related to the storming stage, the items in section D were about the norming stage and the last section inquired about the performing stage with eight items.

Table 1: Distribution of items in the survey.

Section	Stage	Items
B	Forming	7
C	Storming	6
D	Norming	8
E	Performing	8
	Total Number Of Items	29

Table 2: Reliability of survey.

Reliability Statistics	
Cronbach's Alpha	N of Itmes
. 787	29

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .787, thus, revealing a good reliability of the instrument used in the study. Further analysis using SPSS was done to present findings to answer the research questions for this study.
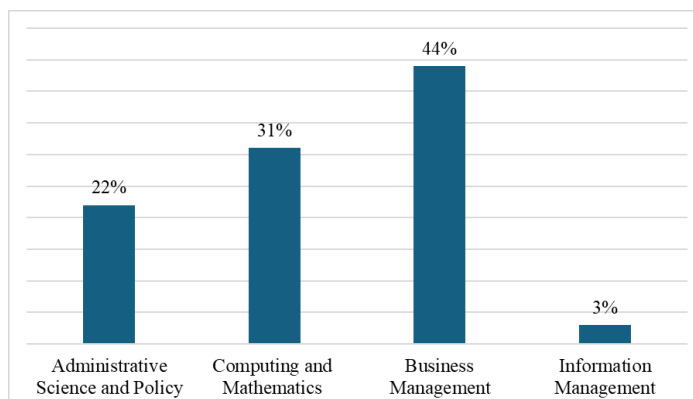
Findings

Findings for Demographic Profile
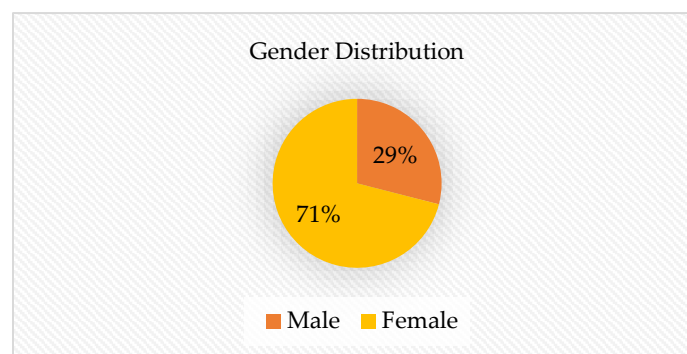
Figure 2: Distribution of gender among respondents.

The figure above indicates that the respondents consisted of more female undergraduate students than male students. More than half of the respondents were females, 71% whereas male respondents were only 29%.

Figure 3: Distribution of respondents' study discipline.

The above figure depicts the respondents' discipline of study. Most of the respondents, 44%, were from the business management program. The second highest were those from the computing and mathematics background, 31%. The least of the respondents were those from the information management program whereas the second least were represented by those from the administrative science and policy program. Business management undergraduate students mostly participated in the study because currently at the university, the business management faculty had the largest number of students of all other faculties.
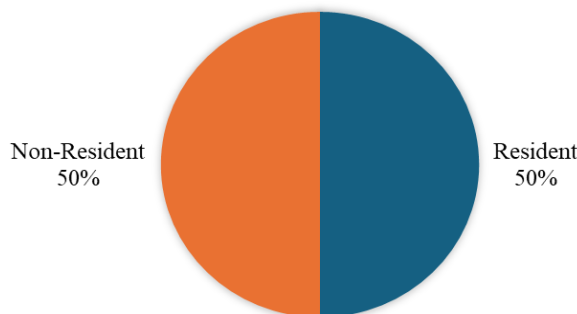
Figure 4: Percentage of residential status.

Figure 4 shows the frequency of students' residency. 50% of the respondents were residents as the students stayed at the campus hostel and 50% of them were non-hostel-residents.

Findings for Forming Stage
This section presents data to answer research question 1:
How do learners perceive the forming stage in group work?

		Mean
FQ1	At the start, we try to have set procedures or protocols to ensure that things are orderly and run	4.3
FQ2	At the start, we assign specific roles to team members	4.4
FQ3	At the start, we are trying to define the goal and what tasks need to be accomplished.	4.3
FQ4	At the start, team members are afraid or do not like to ask others for help.	2.5

FQ5	At the start, team members do not fully trust the other team members and closely monitor others who are working on a specific task.	2.3
FQ6	At the start, it seems as if little is being accomplished with the project's goals.	2.8
FQ7	At the start, although we are not fully sure of the project's goals and issues, we are excited and proud to be on the team.	4
Mean group		**3.5**

Figure 5: Mean for forming stage.

Figure 4 shows the mean scores for the forming stage where learners are at the stage of organizing the group. Majority of the participants (M=4.4) believed that "assigning specific roles to team members" is the most crucial aspect of the forming stage. Next, items 1 and 3, both have a mean score of 4.3, showing that the participants agreed that at the start of group work, they tried to have set procedures or protocols to ensure that things are orderly, and they tried to define the goal and what tasks need to be accomplished. Meanwhile, the lowest mean score is for item number 5 (M=2.3) indicating participants' disagreement that they "do not fully trust the other team members and closely monitor others who are working on a specific task". These mean scores indicate that the participants consider it essential to assign specific roles for every group member before they start managing the group tasks. Additionally, the findings suggest that participants generally do not have trust issues with their group members.

Findings for Storming Stage
This section presents data to answer research question 2:
How do learners perceive the storming stage in group work?

		Mean
SQ1	During discussions, we are quick to get on with the task on hand and do not spend too much time in the planning stage.	2.9
SQ2	During discussions, the team leader tries to keep order and contributes to the task at hand.	4
SQ3	During discussions, the tasks are very different from what we imagined and seem very difficult to accomplish.	3.1
SQ4	During discussions, we argue a lot even though we agree on the real issues.	2.6
SQ5	During discussions, the goals we have established seem unrealistic.	2.7
SQ6	During discussions, there is a lot of resisting of the tasks on hand and quality improvement approaches.	2.2
Mean group		**2.9**

Figure 6: Mean for storming stage.

Figure 5 presents the mean scores for the storming stage which is the most challenging stage in group work. There are 6 questions prepared to identify participants' perspectives regarding conflict faced during the group work. The highest mean score (M=4) is for item number 2, where participants regarded group leaders as individuals who maintain order and contribute significantly to the task at hand. For item number 4, the mean value is rather low (M=2.7), showing that the participants did not argue a lot during the group discussions. The lowest mean score (M=2.2) is for the last item, indicating that participants disagreed with the notion that the group resisted assigned tasks and quality improvement approaches. All in all, the findings for this stage align with the previous stage, emphasizing the importance of clearly defining each member's role from the outset of group formation. This clarity is crucial because if the

participant is designated as the group leader, they are responsible for maintaining order and contributing to the task at hand.

Findings for Norming Stage
This section presents data to answer research question 3 :
How do learners perceive the norming stage in group work?

		Mean
NQ1	In the group, we have thorough procedures for agreeing on our objectives and planning the way we will perform our tasks.	4
NQ2	In the group, we take our team's goals and objectives literally, and assume a shared understanding.	4.2
NQ3	In the group, the team leader ensures that we follow the procedures, do not argue, do not interrupt, and keep to the point.	4
NQ4	In the group, we have accepted each other as members of the team.	4.4
NQ5	In the group, we try to achieve harmony by avoiding conflict.	4.3
NQ6	In the group, the team is often tempted to go above the original scope of the project.	3.5
NQ7	In the group, we express criticism of others constructively	3.7
NQ8	In the group, we often share personal problems with each other.	3
Mean group		**3.9**

Figure 7: Mean for norming stage.

For the norming stage, to understand participants' perceptions about achieving harmony in group work, eight questions were prepared for them. The highest mean value (M=4.4) is for item 4, indicating the participants felt they accepted each other as group members. Next, for questions 1 and 4, they share the same mean value (M=4). We can draw the connection between these two questions in which question number 1 is about the thorough procedures for agreeing on the group objectives and thorough planning in performing the tasks with the group members. Meanwhile, for question 3, the team leader will shoulder the responsibility of ensuring all the procedures were followed without argument, interruption and deviation. Therefore, understanding each other's role is essential from the start to the end of group tasks. Lastly, the lowest mean value (M=3) is for the final question, depicting that the participants only shared their personal problems with each other in the group sometimes.

Findings for Performing Stage
This section presents data to answer research question 4 :
How do learners perceive the performing stage in group work?

		Mean
PQ1	In the end, our team feels that we are all in it together and shares responsibilities for the team's success or failure	4
PQ2	In the end, we do not have fixed procedures, we make them up as the task or project progresses.	2.7
PQ3	In the end, we enjoy working together; we have a fun and productive time.	4.3

PQ4	In the end, the team leader is democratic and collaborative.	4.1
PQ5	In the end, we fully accept each other's strengths and weakness.	4.3
PQ6	In the end, we are able to work through group problems.	4.3
PQ7	In the end, there is a close attachment to the team.	4.1
PQ8	In the end, we get a lot of work done.	4.5
Mean group		4.0

Figure 8. Mean for performing stage.

In the final stage of group work, known as the performing stage, the group members begin to adapt to the varying needs of their group members. Figure 8 depicts that the majority of the participants performed positively for every item except for item number 2. The highest mean value for this stage is for the last item (M=4.5). This indicates, the majority felt they accomplished a lot of work together by the end of group work. Additionally, three items share the same mean value (M=4.3), reflecting the participants' enjoyment of working together, acceptance of each other's strengths and weakness, and ability to solve group problems. There are also two items with the same mean value (M=4.1). For question 4, the participants perceived their team leaders as being democratic and collaborative and for question 7, in the end of the group work, the participants found that they kindled a close attachment to the group. Lastly, the lowest mean value (M=2.7) is for item number 2, where the participants disagreed with the idea that they lacked fixed procedures and made them up as the task or project progressed. From these findings, it is evident that the participants selected 'very often' that they managed to get things done when working in a group.

Findings for Relationship between Learner-to-instructor Interaction with Learner-to-learner and Learner-to-content Interaction

This section presents data to determine whether there is a relationship between all stages in group work. To examine whether there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social and affective strategies data is anlaysed using SPSS for correlations.

Results are presented separately in the tables below.

Table 3: Correlation between forming and storming.

Correlations

		FORMING	STORMING
FORMING	Pearson Correlation	1	.422**
	Sig. (2–tailed)		.000
	N	105	105
STORMING	Pearson Correlation	.422**	1
	Sig. (2–tailed)	.000	
	N	105	105

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

Table 3 shows there is an association between forming and storming stages. Correlation analysis shows that there is a moderate significant association between forming and storming stages(r=.422**) 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 moderate positive relationship between forming and storming stages.

Table 4: Correlation between storming and norming.

Correlations

		STORMING	NORMING
STORMING	Pearson Correlation	1	–.142
	Sig. (2–tailed)		.148
	N	105	105
NORMING	Pearson Correlation	–.142	1
	Sig. (2–tailed)	.148	
	N	105	105

Table 4 shows there is a negative association between storming and norming stages. However, correlation analysis shows that there is no significant association between storming and norming stages (r = .-142) 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.

Table 5: Correlation between norming and performing.

Correlations

		NORMING	PERFORMING
NORMING	Pearson Correlation	1	.619**
	Sig. (2–tailed)		.000
	N	105	105
PERFORMING	Pearson Correlation	.619**	1
	Sig. (2–tailed)	.000	
	N	105	105

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

Table 5 shows there is an association between norming and performing stages. Correlation analysis shows that there is a strong significant association between norming and performing stages(r=.619**) 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 6: Correlation between performing and storming.

Correlations

		PERFORMING	FORMING
PERFORMING	Pearson Correlation	1	.202*
	Sig. (2–tailed)		.039
	N	105	105
FORMING	Pearson Correlation	.202*	1
	Sig. (2–tailed)	.039	
	N	105	105

*. Correlation is significant at the 0.05 level (2–tailed).

Table 6 shows there is an association between performing and norming stages. Correlation analysis shows that there is a weak significant association between performing and norming stages($r=.202**$) 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 weak positive relationship between performing and norming stages.

Discussion

The study findings have indicated undergraduate students' perceptions regarding their participation in group work. At the forming stage, students believed that it is important to assign specific roles to every group member. Sankaran et al. (2019) asserted that assigning and mobilizing the right group members are essential for a group's success. Their study found that at the initial stage of a project, group work began with assigning group members which was done by those with higher authority than contribute to a group's positive progress. It is similar to what we found in the present study. Moving on to the storming stage, the students perceived the crucial role played by their group leader who should be responsible for managing their group's direction as this would contribute to the fulfilment of the assigned tasks. From a social cognitive perspective, followers construct their own perceptions that an individual – one of their group members has the specific qualities that qualify him/her to lead their group (Thomas et al., 2013). As they entered the norming stage, after overcoming the issues and difficulties at the previous stage, students began accepting their group members' differences and regarded everyone as a team member. Conflicts could arise, for example, in a situation where the group members consist of mixed proficiency or academic performance levels (Mittelmeier et al., 2018). Conflicts could also arise due to highly resistant attitudes influenced by individual's social identity and psychological processes that can have negative outcomes on others who are different from us (Murrar & Brauer, 2019). In this study, the result shows that as the group work progresses, the group members manage to overcome the internal conflicts between them. Again, as indicated in the result, as the students moved on from one stage to another, they believed that they had successfully accomplished the assigned tasks once they were at the final stage of group work.

Conclusion

This study has proven the usefulness of Tuckman's model, hence, it can be integrated into the teaching and learning processes which incorporate group projects such as discussion, presentation, mini research, role play and many others. Working as a group has also been recommended as an effective strategy for soft skills development. If group work is implemented as one of teaching and learning methods, students must be guided to experience, internalize,

understand and appreciate the dynamics of Tuckman's model (Betts & Healy, 2015) so that they will experience the processes hands-on. There were many limitations in our study, but, future research can be conducted to address these by recruiting more research respondents to examine differences between genders, study programs, language proficiency and cultures. Adding a pre-test and post-test will be useful to examine the effectiveness of an intervention on group work.

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