Maximising The Zone of Proximal Development Benefits in Group Online Learning

Ainul Rasyiqah binti Sazali, Fikhriah binti Khamarudin, Siti Nurfiza binti Abdul Alahdad

Maximising The Zone of Proximal Development Benefits in Group Online Learning

Ainul Rasyiqah binti Sazali, Fikhriah binti Khamarudin, Siti Nurfiza binti Abdul Alahdad

Akademi Pengajian Bahasa, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
Email: ainul437@uitm.edu.my, fikhriah@uitm.edu.my, nurfiza6582@uitm.edu.my

Abstract

The pedagogical method in higher education is changing. Thus, the important focus in this time of change is active learning which one of its important elements is collaborative learning or small group work. Group work has been found good for students as well as instructors. Online learning is now a major medium in the world of education, especially after the worldwide pandemic. Online group work also has become popular in instructional strategy. Online groups are usually small, hence they are designed to help online students in developing some important skills, share and challenge others ' ideas, and as preparation for future careers. In online learning, activities designed for interaction can help learners to get through the zone of proximal development. According to Vygostky (1978), the zone of proximal development (zpd) is the distance between "actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). For the learners to get through this zpd, the learners need assistance from people around them. Learners can get through zpd when they are guides to focus on (a) social interactions and the presence of (b) more knowledgeable others. The purpose of this paper is therefore to investigate the experiences of students working in group online learning to explore its benefits through the Zone of Proximal Development, based on the data from 481 students at a public university. A quantitative survey that consists of 3 main sections with 42 items and a 5-point Likert scale was employed. Data revealed that students get more benefits from working in a group in an online environment than working individually. Findings show how online learning affects social interaction, inspires the participation of more knowledgeable others, and also improves interaction with content among learners. Findings reveal that learners found that they engage more in online group work if they are in the same group with their chosen group members, and also have the motivation to finish tasks with the support of their peers from the same group. In addition, it can improve students' language skills indirectly and further understanding of non-verbal cues. Findings indicate the benefits of working in groups as it can increase students' knowledge by learning communication skills. They learn how to justify others' opinions and vice versa, thus enabling them to have meaningful interactions. Students also learn how others solve communication problems. Besides that, there is a need for instructors to work and assist learners with the difficulty of

communication presented by online environments. It would be informative for future research to investigate how students manage online group work over time, and how group work management is affected by various variables at the individual and group levels.

Keywords: Collaborative Learning, Group Work, Online Group Work, Zone of Proximal Development, Group Online Learning.

Introduction

Background of Study

Research suggests that students learn best when they are actively involved in the process of learning (Davis, 1993). According to Wasley, "students who participate in collaborative learning and educational activities outside the classroom and who interact more with faculty members get better grades, are more satisfied with their education, and are more likely to remain in college (Wasley, 2006). A collaborative learning environment, as opposed to a passive learning environment, helps students learn more actively and effectively (Murphy et al., 2005).

While online group work is defined as students working together as a small group, "executing simultaneous, collaborative work processes through electronic media without regard to geographic location" (Chinowsky & Rojas, 2003). Online group work has its new challenges for students. They are required to manage online group work including arranging their online and offline study environments (Deimann & Bastiaens, 2010), coordinating time for group work (Biasutti, 2011), keeping themselves motivated (Smith et al., 2011), and coping with negative emotions in the group work process (Ku et al., 2013).

Online learning environments are designed in many ways using various strategies to meet the needs of learners. For example, learners in online courses or subjects are asked to complete assessments needed individually as well as by group. The group work that takes place in online courses thus ranges from participation on a discussion board to work in small groups as part of the learning process. Students in a small group may also work with other students to complete a group project, such as writing a paper or developing a product through discussion, negotiation, and feedback in an online learning environment (Koh & Hill, 2009).

Statement of Problem

In learning, students are often required to complete tasks individually and collaboratively. Group work is one of the effective methods in learning to help students achieve success and excellence in their studies as well as their future working life, particularly including weaker students who often learn more effectively in such an environment. This is because their future career almost certainly involves working in groups with different skills and abilities. Group work tasks also can develop leadership skills among students through giving and receiving orders, the readiness to be criticized and to adapt to changes from time to time.

The benefits and advantages that students can get from group work call for its implementation in the online learning environment, in line with the changes in teaching pedagogy in this era. Specifically, there are various advantages of online group work that students will benefit from if they collaborate effectively and if the instructors facilitate appropriately. As (Koh & Hill, 2009) described, students may receive more thoughtful and in-depth comments from their classmates than what might occur in a synchronous context, as an asynchronous environment gives them more time to think and reflect before giving a response or feedback to their group members. This can develop critical thinking skills as well

as reflection skills. Another benefit is flexibility. The flexibility of an online learning environment gives convenience to learners in terms of time spent, which enables them to contact group members anywhere and anytime. Online group work also provides opportunities for social and active learning. Students can engage with their classmates, connect, share and collaborate so they do not feel so distant and alone, especially during this Covid19 time. As Roberts & McInnerney (2007) concluded that in an online setting, the use of group work can greatly reduce the feeling of isolation experienced by many students, even the most successful ones. Donelan & Kear (2018) also highlight that the benefit of an online group project, compared to a face-to-face one, is that when students are using online tools to collaborate there is typically a record of the interactions taking place where it is possible to observe the details of discussions.

Although group work is believed to give benefits to both face-to-face and online learners, some of them still try to avoid working in groups, especially in an online learning environment. This is because some of them have bad experiences or negative perceptions and attitudes towards online group work (Smith et al., 2011), resulting from several challenges and difficulties they have faced previously. According to Robert & McInnerney (2007), the seven problems most commonly faced by students are student antipathy towards group work, the selection of the groups, a lack of essential group-work skills, the free rider, possible inequalities of student abilities, the withdrawal of group members, and the assessment of individuals within groups. A study from Koh & Hill (2009) reports that difficulties with communication, lack of sense of community, and time management are among the problems of online group learning. Online learning participants indicated a lack of connection with faculty and other learners, stating that this reduced sense of connection affected their overall class experience. A lack of connection can also affect group work in online environments. Another challenge is the different levels of technology skills among students. Hence, this study is done to investigate learning in groups via online mode. This investigation is done to answer the following questions;

- How is learners' engagement perceived in online classes?
- How does the zone of proximal development benefit online group work?
- How is social interaction displayed in online group work?
- How do more knowledgeable others benefit from online group work?

Literature Review
Introduction

Online learning is now a major medium in the world of education, especially after the worldwide pandemic. The average learns virtually or online to gain knowledge. However, as discussed in the beginning, the investigators would like to discuss together the proximal developmental zone (ZPD) which is the ability of an individual who is allowed to perform a task with assistance or vice versa. still unable to execute it independently. In addition, students' interaction with each other is also important to create a harmonious learning environment.

Online Group Interactions

Patricia (2009) said online group interaction is the use of computer-mediated communication, such as e-mail, chat, or a threaded discussion, by a group to communicate for the purposes of carrying out a task. So, student interaction is very important and is a contributing factor to success in online learning.

Online Group Interactions are part of collaborative learning. Gokhale (1995), Collaborative learning is a teaching method in which students work in groups towards common academic goals. But Johnson and Johnson (1996) in collaborative learning each student should play their respective roles to achieve a balance between individual abilities and interdependence between group members and he (2009) also stated that students in the same group strive to achieve the same objectives and the achievement of each group member also determines the achievement of the other group members

Interaction, according to Heift and Caws (2000), is the most important element capable of improving students 'thinking skills. Interaction (Swan, 2001) is the dissemination of ideas, thoughts, emotions, knowledge, or processes involving at least two people, in which a student and a lecturer interact with each other. while (Jonassen et al., 1995) argue that through interaction also students get the opportunity to engage during the process of building knowledge by sharing ideas and building new knowledge through the information received. However, (Moore, 1989), states that there are three types of interactions found in learning namely interactions between students with students, students with lecturers, and students with content.

Computer-assisted collaborative learning is one of the potential mediums to further enhance interaction and collaboration between students and students in group learning (Martindale et al., 2005). This computer-assisted collaborative learning also provides the same learning as learning in the classroom but now there is still room for improvement (Kreijns et al., 2002). This medium has proven to have the strength to be able to deal with conventional classroom learning such as time constraints and space constraints (Huffaker and (Calvert, 2003).

Nevertheless, some studies have found such online projects to be so effective that Katz and colleagues recommend group projects should not be done at all (Katz et al., 2021), Katz and colleagues emphasize that collaborative projects are important. They support short-term group project assignments, manage them carefully and keep them unimportant. Given that students are now faced with things like illness and even death, unreliable broadband, and an inadequate work and learning environment, it is unfair to burden them with interdependence. They suggest that it is extremely difficult online to manage students who distance themselves, leave class for some time or fail to contribute, leaving their peers in charge of the group. However, guiding students in effective collaboration is one of the best ways to guide them in this crisis. While many of these suggestions are helpful, they would like to deny that managing group dynamics do not benefit students. It's very complicated.

Although difficult, now is the right time to help students learn how to collaborate online. Rejecting group projects now, because the world is increasingly dependent on them, does not prepare our students for life outside of college. Instead, they suggested that they need to show students why collaboration is important. In most workplace settings, collaboration is required so that we can succeed in tasks that no one else can manage. Online collaboration is difficult but important.

Therefore, the researchers also agreed with what they suggested that Student interaction is an important element and is a contributing factor to success in online learning and also able to improve students' thinking skills through the dissemination of ideas, thoughts, emotions,

knowledge and get the opportunity to engage during the process of building knowledge by sharing ideas and building new knowledge through information which is accepted.

Zone of Proximal Development in Online Learning

In online learning, activities designed for interaction can help learners to get through the zone of proximal development. According to Vygostky (1978), the zone of proximal development (zpd) is the distance between "actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).

Vygotsky felt that when learners are put in a situation to learn (the learning zone), they are actually in the zpd. In the context of online learning, the learning zone exists online when it comes to the exchange of knowledge among learners in group interactions. Regarding Figure 1, technology and tools are seen as the elements in the learning zone. The presence of technology and tools (especially in an online environment) is to be seen as a catalyst for learning.

For the learners to get through this zpd, the learners need assistance from people around them. Learners can get through zpd when they are guides to focus on (a) social interactions and the presence of (b) more knowledgeable others.

Social Interaction

Learners gain more than just knowledge through social interaction during group work. During social interaction, verbal and non-verbal exchanges are used to get messages across. The exchanges enable an exchange of information among team members. Sometimes (oftentimes) group conflicts occur. Contrary to popular beliefs, conflicts do not impede learning or progress in group interactions. Conflicts encourage problem-solving to take place. Group members faced with conflicts often have to use their thinking skills to get their points across or even to defend their existing points.

More Knowledgeable Other

The term "more knowledgeable other" is somewhat self-explanatory. In a group interaction, there are a variety of people. Some have more knowledge than others. Traditionally, a more knowledgeable other can be the teacher, the older peer, but it can also be a peer. Similarly (more so), in online group work, group interactions allow the transfer of knowledge from one person with more experience to another.
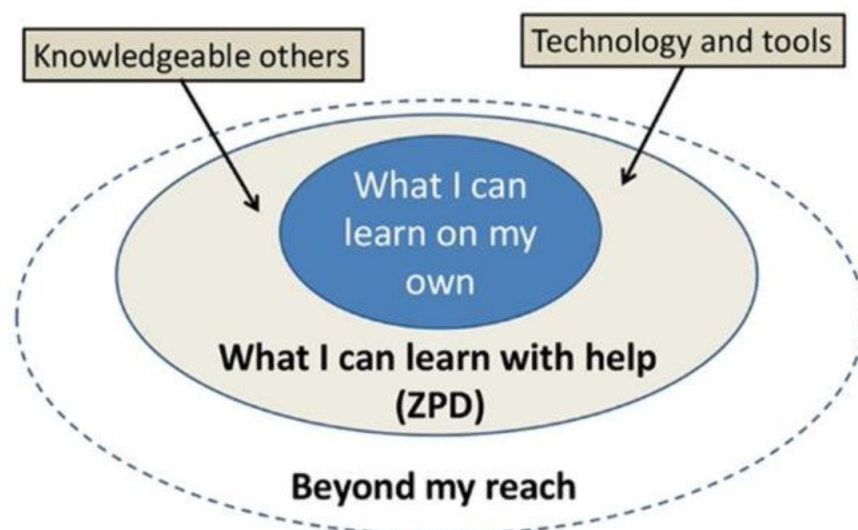
Figure 1- Zone of Proximal Development
(Source: Vygotsky, 1978)

Past Studies
Past Studies on Online Interaction
There have been many past studies on online interaction. The study by Rahmat, Mok, Lau, & Ling (2021) was done to investigate how online interaction influences the learning of Mandarin in language classrooms. Online learning platforms can be used to help reduce the zone of proximal development as online interaction can facilitate interaction among learners. 173 participants responded to a 28 items (5 Likert scales) instrument. Generally, this study has been done to explore the viewpoint of learners on learning Mandarin online. Specifically, they addressed three research questions:

• How does interaction influence online learning among learners of Mandarin?

• What influence does knowledgeable others have on learners of Mandarin online

• How does online learning influence Learner-to-content (technology and tools) engagement?

Findings indicate how online learning affects learners' interaction with their peers and content, and also strengthens the participation of more knowledgeable others. Findings reveal that the learners appreciated the chance to interact in various ways. The interactions encouraged more discussions among them thus enabling more meaningful interactions. According to Martin & Bolliger (2018), they agreed that interactions helped learners in deepening the content. However, they suggested structured rather than unstructured discussions.

While more knowledgeable others refer to both peers and their instructors. Learners are given the chance to communicate in a more informal setting. Interaction with a more knowledgeable other can allow learners to learn more than they already know. Xu et al (2019) felt that more knowledgeable others allow learners to practice their pronunciation skills in a less threatening environment for the learners.

There is also a study by (Koh and Hill, 2009). This study has been carried out to investigate the experiences of students involved in online group work to explore its benefits and challenges. The purpose of this study was to gain a further understanding of some of the

factors that students perceive as beneficial and challenging to group work online. Specifically, they addressed three research questions:

- What factors of online group work do students recognize as beneficial in the learning process?
- What factors of online group work do students recognize as challenging in the learning process?
- How do students' perceptions of online group work differ between individuals reporting they were satisfied with the online group work experience and those reporting they were unsatisfied with the online group work experience?

A mixed-methods (quantitative and qualitative; survey and interviews) design was used to answer the research questions. The survey items were used to determine what level of perceived challenges, and also perceived beneficial factors in their group work experiences. The participants in this study were all graduate students at a university in the Southern United States. Most of them were instructional technology majors and had taken several classes online.

Survey data were collected via a Web-based survey. After conducting the survey, the first author interviewed the participants. The interviews have been held to obtain data concerning the students' perceptions of group work in an online class and to get their advice for new learners and online instructors about managing and facilitating student online group work.

The results of this study revealed several trends in the factors perceived by learners as beneficial and challenging regarding group work in an online class. Among the survey results, the analysis of the interview transcripts indicated participants perceived the lack of a sense of community, difficulty with communication, and lack of time as challenges for group work. The biggest challenge reported by the study was some participants who had no commonality such as major, program, age, or job (teacher or non-teacher) felt more about the lack of a sense of community in their group. The results from the study also show that students found that online group work was more difficult than group work in face-to-face settings. Thus, the difficulty with communication and lack of a sense of community were among the top factors in terms of what students indicated as most challenging in this study.

Past Studies on Group Work Online

There have been many past studies on online group work. The study by Bakir et al (2020) is done to investigate students' experiences regarding group work in both face-to-face and online courses. The researchers have conducted two studies. Study 1 identified the types of problems students self-reported in group work and examined whether face-to-face and online students experienced the same problems. The participants were undergraduate students at a regional university in the southern United States. A survey and qualitative analysis were used. 120 participants (52 face-to-face students and 68 online students) have completed the survey. Results showed that students identified lack of communication, participation, collaboration, accountability, and interaction as the most common problems experienced. The main finding of study 1 (without communication tools) noted that students from both face-to-face and online courses considered a lack of communication with their group members to be their largest hindrance.

As for study 2, the researchers try to overcome the communication problem in completing group projects by experimenting with the use of the communication software Slack to communicate and the use of Google Docs to track responsibilities and improve accountability. 129 participants (67 face-to-face students and 62 online students) have completed the survey. The vast majority of online and face-to-face students reported

improvements in communication between group members and group collaboration because of Slack and Google Docs. This study stressed the importance of educators, by overcoming these inter-group communication challenges will give students a valuable skill to take into the workforce. Group projects can be a valuable experience in academics to apply knowledge, solve problems, and develop teamwork skills. These skills are requested by employers.

Another study conducted by Xu et al (2015) tries to investigate empirical models of group work management in an online collaborative learning environment, according to the self-regulation perspective. Our study examined empirical models of variables to predict group work management in online collaborative learning environments. Data indicated that six student-level variables explained the variance in online group work management (i.e., age, previous online courses, peer- and learning-oriented reasons, feedback, and help-seeking). At the group level, online group work management was positively associated with feedback and help-seeking.

The participants in the present study consisted of 298 students (86 groups) from one university in the southeastern United States. These online groups ranged from 2 to 4 students. Of these participants, 167 were females (56.0%) and 131 were males (44.0%). Two-thirds of the participants were 30 years or younger (67.2%), whereas one-third of them were over 30 years old (32.8%). Results revealed that, at the student level, online group work management was positively associated with previous online courses, feedback, peer- and learning-oriented reasons, and help-seeking. In addition, older students more frequently took the initiative to manage online group work. Finally, group work management was positively related to help-seeking and feedback at the group level.

Conceptual Framework

Figure 2 presents the conceptual framework of the study. This study is rooted in online engagement by Martin and Bolllinger (2018) and also the zone of proximal development by Vygotsky (1978). During online group activities, learners are given the opportunity to engage with their peers. Usually, group work is part of the course demands and learners need to complete given tasks as team members in the group. This task puts them in the learning zone. To get through this zone of proximal development, learners are allowed to interact socially and also to learn or model from one or several more knowledgeable others.
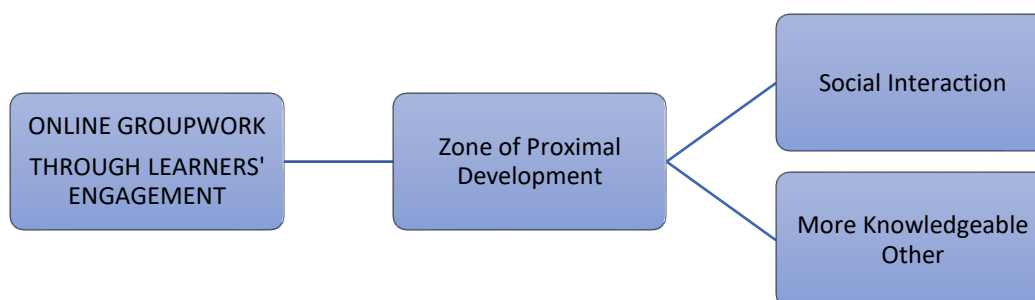

Figure 2- Online Group Work
(Source: Vygotsky, 1978; Martin & Bollinger, 2018).

Methodology

This quantitative research is done to explore learners' interactions in online group work. The instrument used is a survey adapted from (Rahmat et al., 2021; Martin and Bolllinger,

2018). 481 respondents were purposively chosen to answer the survey. The survey has 3 main sections. With reference to Table 1, section A has items on the demographic profile. Section B has 6 items on lear2 'Engagement. Section C has 5 items on the zone of proximal development. Section D has 6 items on social interaction and section E has 5 items on more knowledge other.

Table 1
Distribution of Item in the Survey

SECTION	CONSTRUCT	NO OF ITEMS
B	Learner-to-Learner Engagement	6
C	Zone of Proximal Development	5
D	Social Interaction	6
E	More Knowledgeable Other	5
		22

Table 2
Reliability Statistics for the Instrument

Cronbach's Alpha	N of Items
.974	22

Table 2 presents the reliability statistics for the instrument. SPSS analysis revealed a Cronbach alpha of .974 thus showing high internal reliability of the instrument used. Data is collected online via the goggle form. Data is then analyzed using SPSS version 26. Analyzed data is presented in the form of percentages and mean scores to answer the 4 research questions.

Findings

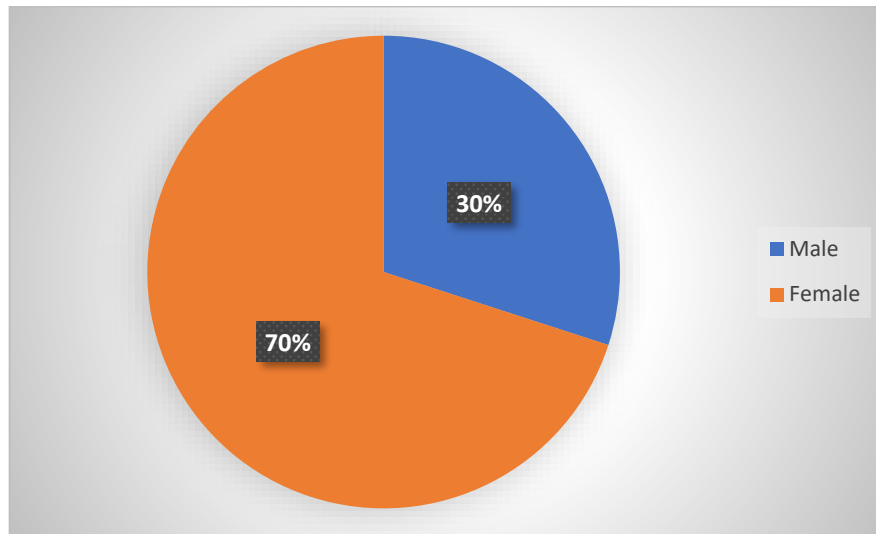*Findings for Demographic Profile*

Figure 2- Percentage of Gender

Figure 2 shows the percentage for gender. It indicates that more females participated in the survey than males.
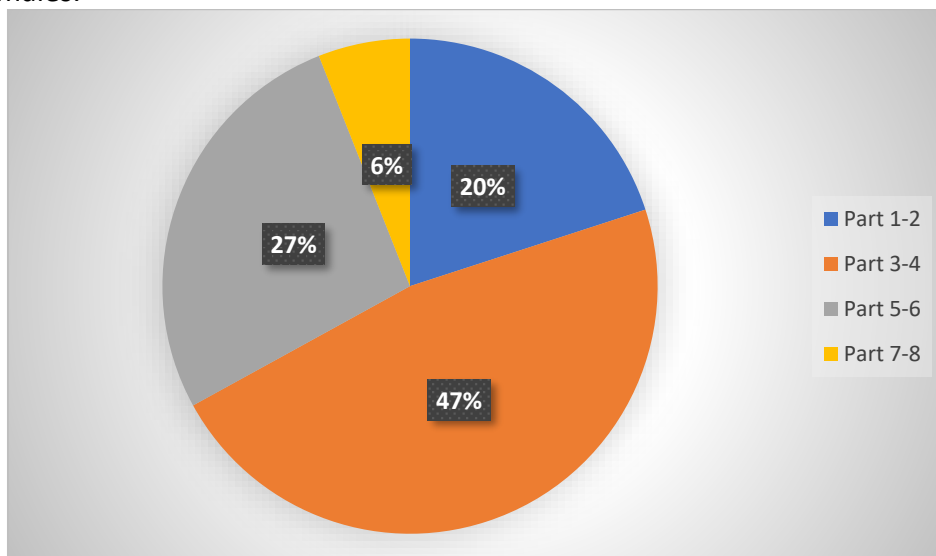

Figure 3- Percentage for Semester

Figure 3 shows the percentage of respondents' semesters they were taking. It shows that most respondents who participated in this survey were from part 3 and 4, followed by part 5 and 6, and also part 1 and 2. The least respondents that participated in this survey were from part 7 and 8.
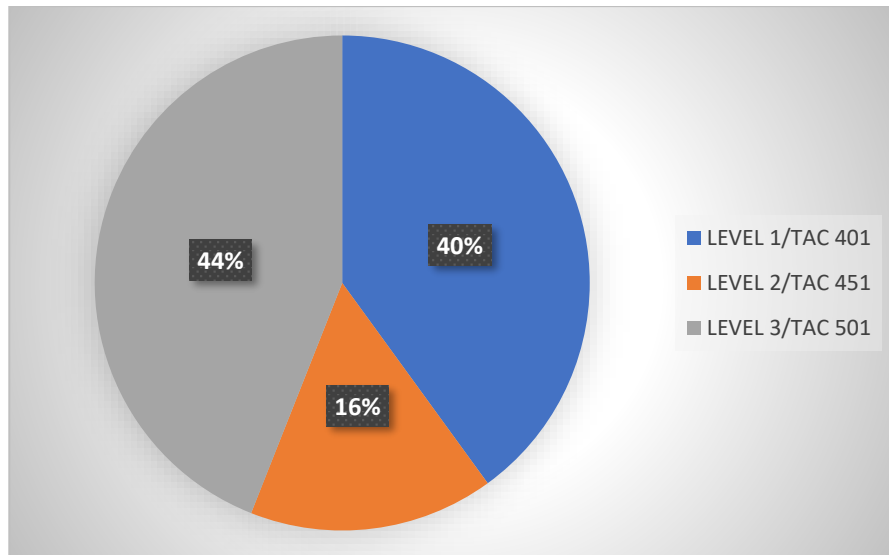
Figure 4- Percentage for Level/ Subject

Figure 4 shows the percentage of level and subject code that respondents were studying when this survey was taken. It indicates that slightly more of the respondents were studying level 3, TAC501 than level 1, TAC401. While the least of the respondents were studying level 2, TAC451.
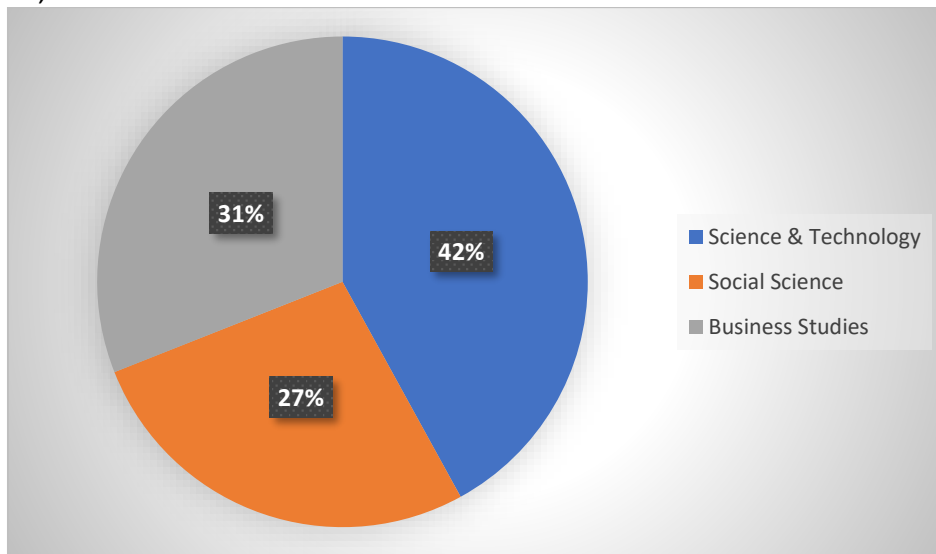

Figure 5- Percentage of Faculty

Figure 5 shows the percentage of faculty of respondents. It reveals that respondents who participated in this survey were from three faculties. Most of them were from Science and Technology, followed by Business Studies and Social Science.
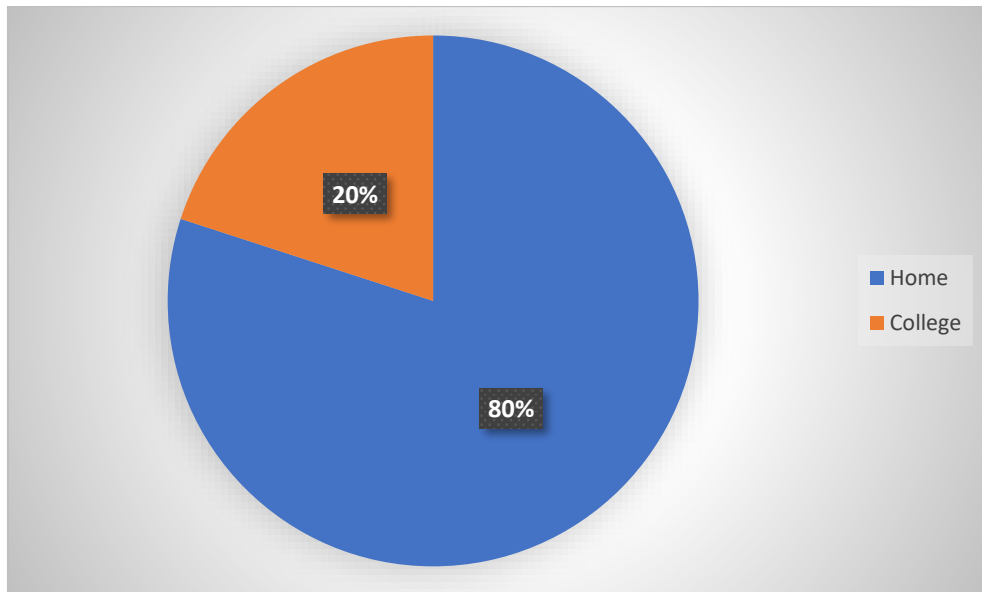
Figure 6- Percentage for learning location

Figure 6 shows the percentage of respondents' learning location. It shows that most of the respondents learned at their home during their semester than those respondents who learned at college.
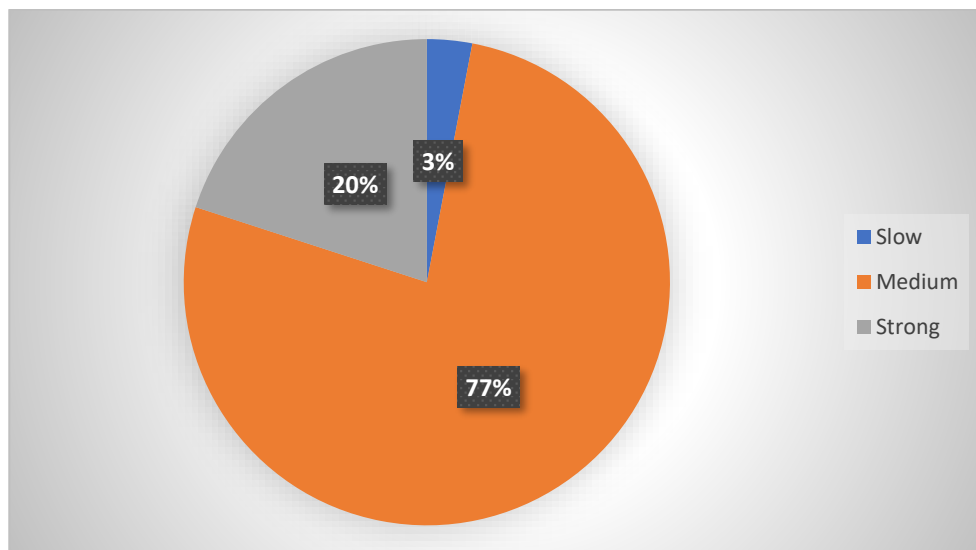

Figure 7- Percentage for Internet Access

Figure 7 demonstrates the strength of internet access for the respondents. The percentages revealed that most of them had medium strength internet connection, while only 3 percent of them has a slow internet connection.
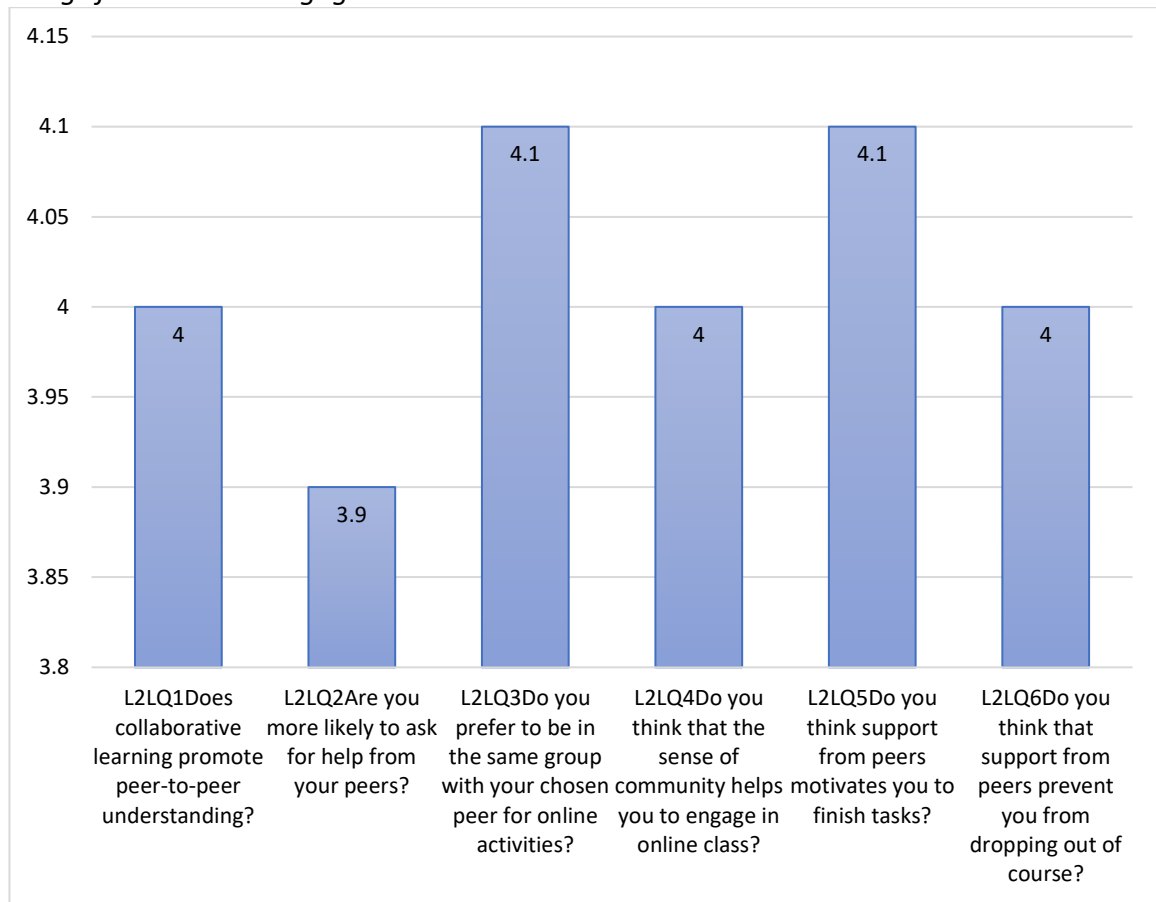
Findings for Learners' Engagement

Figure 8- Mean for Learner-to-Learner Engagement

Figure 8 shows the frequency of learner-to-learner engagement in terms of mean scores. Learners found that they engage more in online group work if they are in the same group with their chosen group members (4.1) and also have the motivation to finish tasks with the support from their peers from the same group (4.1). They also engage by understanding each other (4), and by having a sense of community (4), and also by getting support from their peers to remain in the course (4). The engagement sometimes happens in terms of seeking help from their group members (3.9).
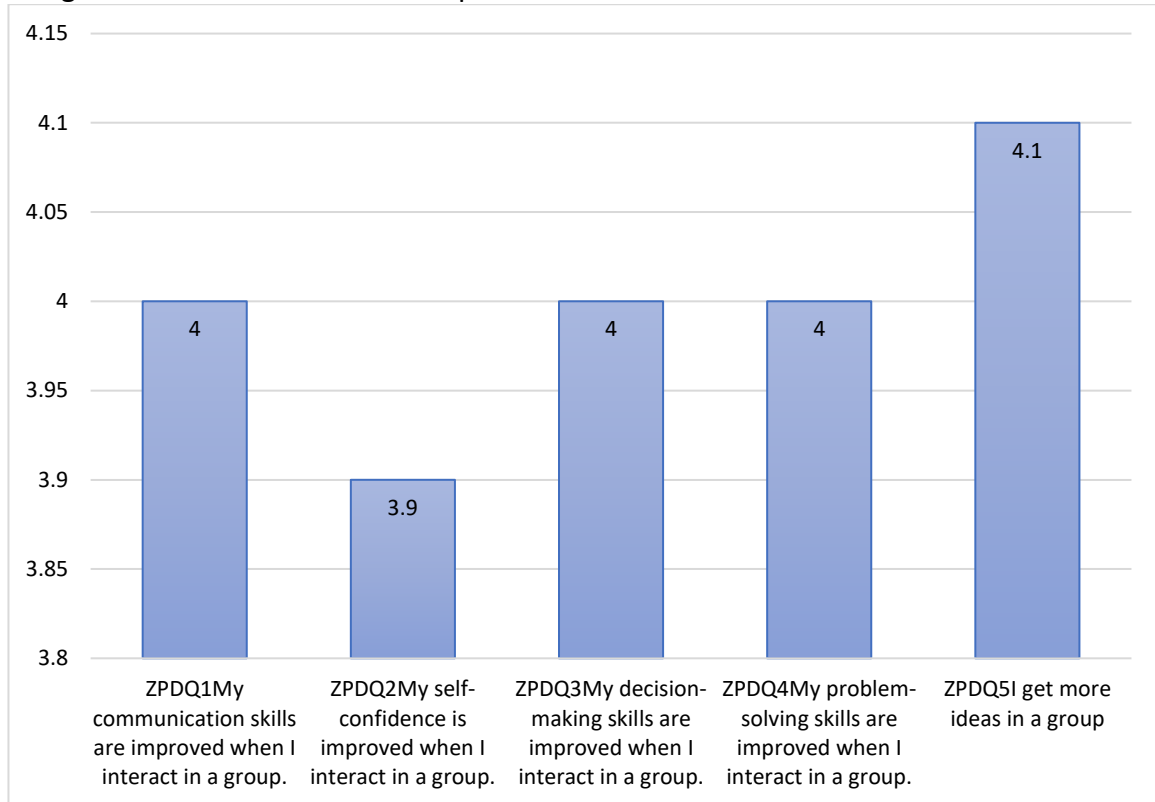
Findings for Zone of Proximal Development

Figure 9-Mean for Zone of Proximal Development

Figure 9 shows the frequency of the benefits of ZPD for online groups in terms of mean scores. Learners benefit from online groups in getting more ideas (4.1). The interaction within the group also can improve learners' soft skills/long-life skills which are important to help them when they enter the workforce (4). Some learners also improve their self-confidence when they interact in a group (3.9).
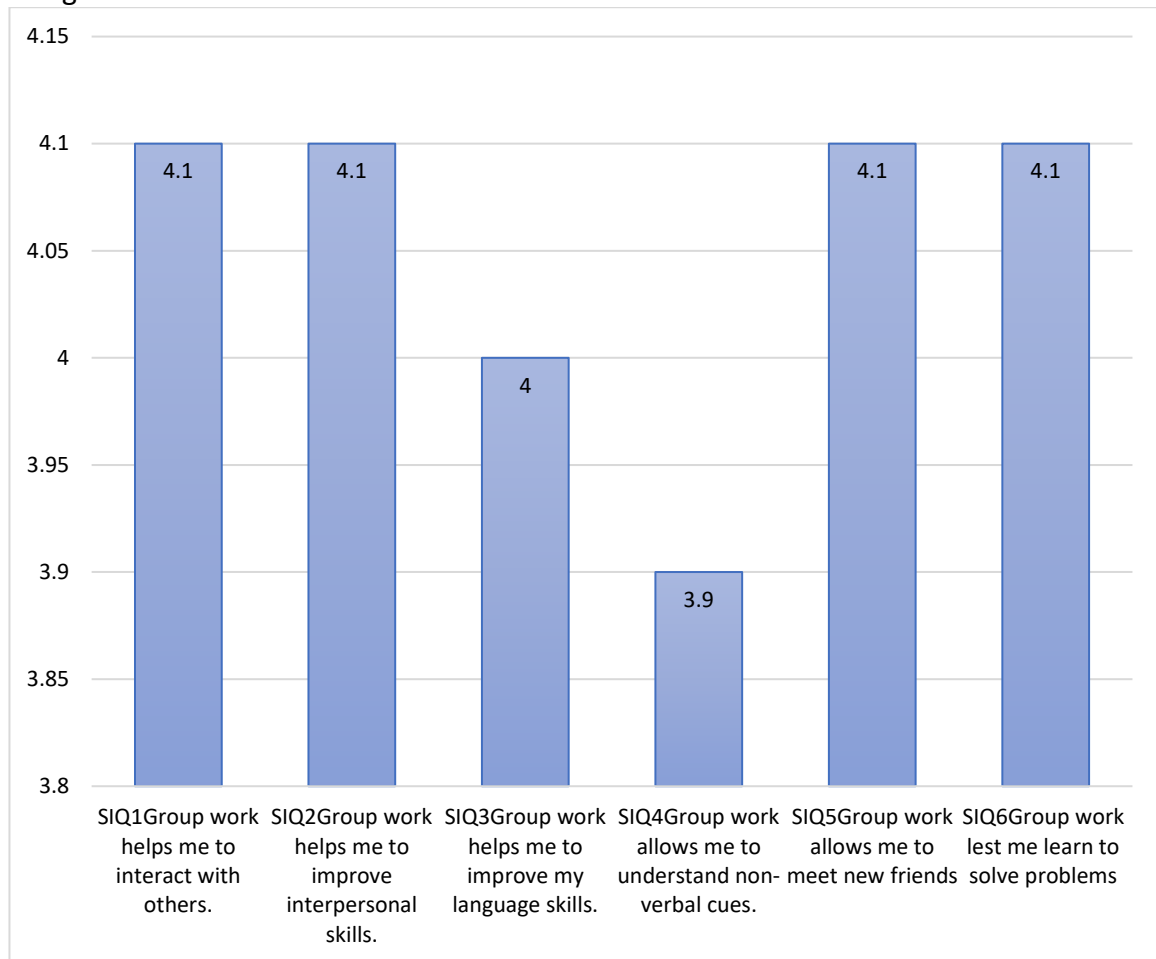
Findings for Social Interaction

Figure 10- Mean for Social Interaction

The figure shows the score through group work done by the students can help them interact with people (4.1), can improve interpersonal skills (4.1), and can help solve problems well (4.1). In addition, it can indirectly improve students' language skills (4) and further understanding of non-verbal cues.
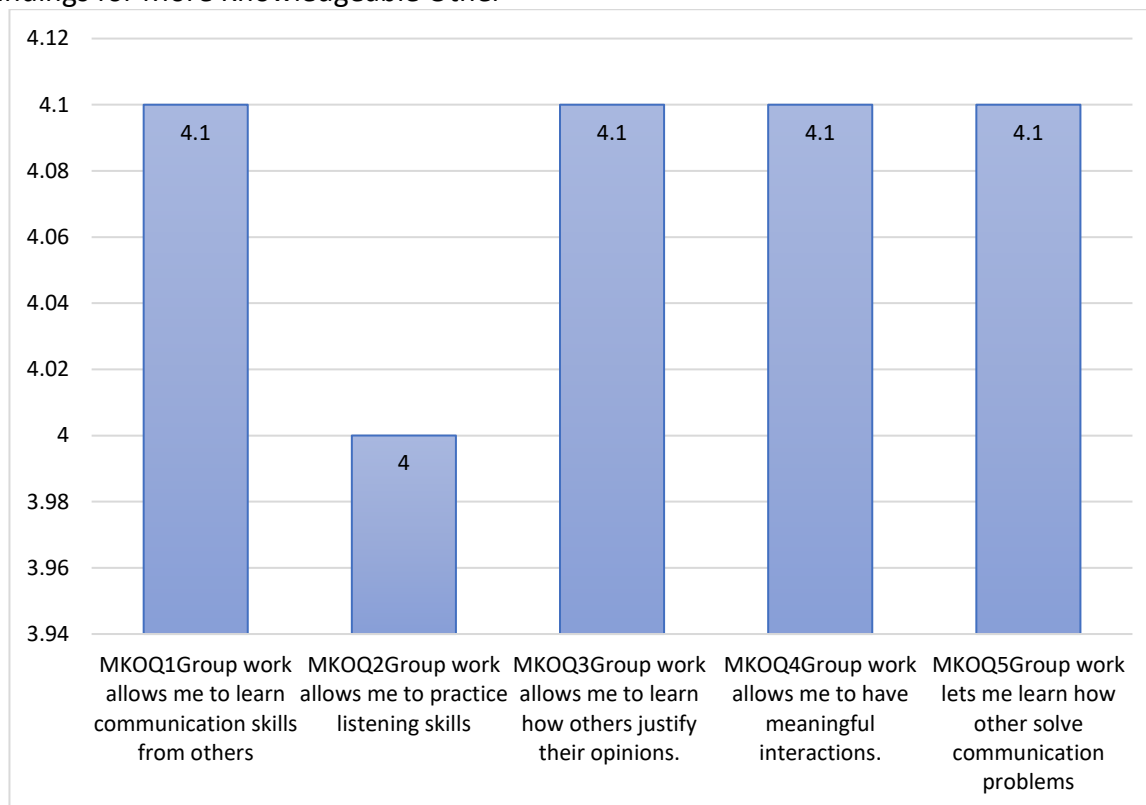
Findings for More Knowledgeable Other

Figure 11: mean for More Knowledgeable Other

Figure 11 shows the benefits of working in groups that can increase students' knowledge by learning the skills to communicate with others (4.1), learn how others justify their opinions (4.1), have very meaningful interactions (4.1), and learn how others solve communication problems. This is because when there is a problem in communication then it will cause conflict among group members and the last through this group work can also train students listening skills that are to understand the true meaning of group members.

Conclusion
Summary of Findings and Discussion
It seems clear that the whole is greater than the sum of its parts. Group work helps students develop teamwork skills as well as social interaction skills. Findings reveal that learners found that they engage more in online group work if they are in the same group with their chosen group members, and also have the motivation to finish tasks with the support of their peers from the same group. They also engage by understanding each other, as well as by having a sense of community and getting support from their peers to remain in the course. The engagement sometimes happens in terms of seeking help from their group members. This finding is in accordance with the study by Jianzhong, Jianxia, and Xitao from the (University of Macau, 2014).

Learners benefit from an online group in getting more ideas. The interaction within a group also can improve learners' soft skills/long-life skills which are important to help them when they set foot in the workforce. Some learners also improve their self-confidence when they interact in a group. Findings indicate the benefits of working in groups as it can increase students' knowledge by learning communication skills. They learn how to justify others' opinions and vice versa, thus enabling them to have meaningful interactions. Students also

learn how others solve communication problems. This is because when there is a problem in communication then it will cause conflict among group members and the last through this group work can also train students listening skills that are to understand the true meaning of group members. This finding is following the study by Rahmat, Mok, Lau, & Ling (2021).

Findings also revealed that through working in groups, students can improve their social interaction skills, interpersonal skills as well as problem-solving skills. In addition, it can indirectly improve students' language skills and further understanding of non-verbal cues.

Pedagogical Implications

There is a need for instructors to work and assist learners with the difficulty of communication presented by online environments. Online group work requires significant interaction among group members (Koh & Hill, 2009). There are several ways for instructors in helping students to form a successful group. First, the instructor needs to be certain that every student understands the assignment. Students should know the purpose of the project, the learning objective, and the skills that need to be developed through group work. Successful group work is easier if the students know how the assignment relates to the course content and what the final product is supposed to be (Davis, 1993).

Second, the instructor should reinforce listening skills as well as communication skills and the proper methods to give and receive constructive criticism. Gaining communication skills to communicate with a diverse group of fellow students in an online class may be a key to success (Watkins & Corry, 2007). These skills can be discussed in class and modeled during class activities. Some faculty use various exercises that are geared toward helping students gain skills to work in groups (Fiechtner & Davis, 1992). Small in-class group activities can help to reinforce group unity.

Third, the instructor needs to help the students in managing conflict and disagreements. There is a need to work with learners to assist them with building familiarity and establishing a community in online contexts. The instructor should avoid breaking up the groups. When a group is not working well together, the students need to learn how to communicate effectively and establish goals for a successful group (Davis, 1993). Another method to help groups succeed and get more benefits by asking each group to devise a plan of action (Davis, 1993), which includes assigning roles and responsibilities to each member of the group. Assisting learners to build strategies for overcoming the difficulty of online communication may prove to be useful.

Suggestions for Future Research

It would be informative for future research to investigate how students manage online group work over time, and how group work management is affected by various variables at the individual and group levels. Although several studies on online group work revealed that group work management in online environments had a positive influence on group work performance (Koh & Hill, 2009), there is also a need to link group work management to the quality of group work itself. It would be important also for future research to manipulate some of the variables; social interactions and more knowledgeable other, and to examine the influences of these manipulations on the next online group work management.

There would be also informative to conduct studies such as this with younger learners such as secondary school, as it may be moderated by students' age. Furthermore, it would be important to examine how students manage online group work in a shared document

platform or application, as the use of such a platform or application may affect how students approach online group work. Finally, it would be valuable and very informative to open a new line of research to better understand and address the challenges regarding online group management in cross-cultural environments, because one's attitudes toward online group work may be influenced by cultural differences regarding the value of individual autonomy and choice (Eccles, 2005) and the value structure of individualism and collectivism (Hofstede, 2001).

References

Bakir, N., Humpherys, S., Dana, K., (2020). Students' Perceptions of Challenges and Solutions to Face-to-Face and Online Group Work. *Information Systems Education Journal*18(5) pp 75-88. http://ISEDJ.org/2020-5/.

Biasutti, M., & El-Deghaidy, H. (2012). Using Wiki in teacher education: Impact on knowledge management processes and student satisfaction. *Computers and Education*, 59, 861-872. https://doi.org/10.1016/j.compedu.2012.04.009.

Chinowsky, P.S., & Rojas, E.M. (2003). Virtual Teams: Guide to Successful Implementation. *Journal of Management in Engineering*, Vol 19(3), 98-106. Retrieved from https://doi.org/10.1061/(ASCE)0742-597X(2003)19:3(98).

Davis, B. G. (1993). *Tools for Teaching*. Jossey-Bass Inc., San Francisco: California.

Deimann, M., & Bastiaens, T. (2010). The role of volition in distance education: An exploration of its capacities. International Review of Research in Open and Distance Learning, Vol 11(1), 1-16. https://doi.org/10.19173/irrodl.v11i1.778.

Donelan, H., & Kear, K. (2018). Creating and Collaborating: Students' and Tutors' Perceptions of an Online Group Project. International Review of Research in Open and Distributed Learning, 19(2). https://doi.org/10.19173/irrodl.v19i2.3124.

Gokhale, A. (1995). Collaborative Learning Enhances Critical Thinking. *Journal of Technology Education*. 7(1), 22-30. https://doi.org/10.21061/jte.v7i1.a.2.

Heift, T., Dan Caws, C. (2000). Peer Feedback in Synchronous Writing Environments: A Case Study in French Educational Technology & Society Educational Technology & Society Vol. 3, No. 3, *On-line Collaborative Learning Environments*, 208-214. Retrieved from https://www.researchgate.net/publication/2404483_Peer_Feedback_in_Synchronous _Writing_Environments_A_Case_Study_in_French.

Huffaker, D. A., Dan Calvert, S. L. (2003). The New Science of Learning: Active Learning, Metacognition, and Transfer of Knowledge in e-Learning Applications. *Journal of Educational Computing Research,* 29(3), 325-334.
https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.92.7860&rep=rep1&type =pdf.

Xu, J., Du, J., & Fan, X. (2015). Students' Groupwork Management in Online Collaborative Learning Environments. *Journal of Educational Technology & Society*, 18(2), 195–205. http://www.jstor.org/stable/jeductechsoci.18.2.195.

Johnson, D. W., dan Johnson, F. P. (2009). *Joining Together: Group Theory and Group Skills*. Boston: Allyn & Bacon.

Johnson, D. W., dan Johnson, R. T. (1996). Cooperation and the Use of Technology. Handbook of Research for Educational Communications and Technology: A Project of the Association for Educational Communications and Technology, 1017-1044. http://members.aect.org/edtech/ed1/pdf/35.pdf.

Jonassen, D., Davidson, M., Collins, M., Campbell, J., dan Haag, B. B. (1995). Constructivism and Computer-mediated Communication in Distance Education. *American Journal of Distance Education*, 9(2), 7-26. Retrieved from https://www.academia.edu/34970721/American_Journal_of_Distance_Education_Constructivism_and_computer_mediated_communication_in_distance_education.

Katz, V. S., Jordan, A. B., Ognyanova, K. (2021). Digital inequality, faculty communication, and remote learning experiences during the COVID-19 pandemic: A survey of U.S. undergraduates. PLOS ONE 16(2). e0246641. https://doi.org/10.1371/journal.pone.0246641.

Koh, M. H., & Hill, J. R. (2009). Student Perceptions of Groupwork in an Online Course: Benefits and Challenges. International Journal of E-Learning & Distance Education / Revue Internationale Du E-Learning Et La Formation à Distance, 23(2), 69-92. Retrieved from http://www.ijede.ca/index.php/jde/article/view/477.

Kreijns, K., Kirschner, P. A., dan Jochems, W. (2003). Identifying the Pitfalls for Social Interaction in Computer-supported Collaborative Learning Environments: A Review of the Research. *Computers in Human Behavior*, 19(3), page 335-353. Retrieved from https://www.researchgate.net/publication/222825930.

Ku, H., Tseng, H. W., & Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior*, Vol 29, 922-1229. https://doi.org/10.1016/j.chb.2012.12.019.

Lambri, A., & Mahamood, Z. (2016). Pendekatan Berpusatkan Pelajar Dalam Pengajaran Dan Pembelajaran Bahasa Melayu Bagi Membentuk Kemahiran Insaniahpelajar Di Universiti Awam. PENDETA, 7, 25 - 34. Retrieved from http://ojs.upsi.edu.my/index.php/PENDETA/article/view/1189.

Martin, F., & Bolliger, D. U. (2018). Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment. *Online Learning, 22*(1), 205–222. http://doi.dx/ 10.24059/olj.v22i1.1092.

Martindale, T., Pearson, C., Curda, L. K., Dan Pilcher, J. (2005). Effects of an Online Instructional Application on Reading and Mathematics Standardized Tests Scores. *Journal of Research on Technology in Education*, 37, 349-360. https://files.eric.ed.gov/fulltext/EJ690977.pdf.

Murphy, K. L., Mahoney, S. E., Chen, C. Y., Mendoza-Diaz, N. V., & Yang, X. (2005). A constructivist model of mentoring, coaching, and facilitating online discussion. *Distance Education*, Vol 26(3), 341–366. Retrieved from https://www.learntechlib.org/p/98483/.

Palloff, R. M., & Pratt, K. (2005). *Collaborating online: Learning together in community*. San Francisco: Jossey-Bass Inc.

Rahmat, N. H., Mok, S. S., Lau, S. K., & Ling, T. S. (2021) An Investigation of How Online Learning Reduces ZPD in Mandarin Language Classrooms. *International Journal of Education*, Vol 13(1), pp 1-15. Retrieved from https://doi.org/10.5296/ije.v13i1.18399.

Reeves, T. C., Herrington, J., dan Oliver, R. (2004). A Development Research Agenda for Online Collaborative Learning. *Educational Technology Research and Development*, 52(4), 53-65. https://doi.org/10.1007/BF02504718.

Roberts, T. S., & McInnerney, J. M. (2007). Seven Problems of Online Group Learning (and Their Solutions). *Journal of Educational Technology & Society, 10*(4), 257-268. Retrieved from https://www.learntechlib.org/p/74872/.

Swan, K. (2001). Virtual Interaction: Design Factors Affecting Student Satisfaction and Perceived Learning in Asynchronous Online Courses. *Distance Education,* 22(2), 306-331. Retrieved from https://www.researchgate.net/publication/240443908.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wasley, P. (2006). Underrepresented students benefit most from 'engagement.' *The Chronicle of Higher Education*, 53 (13), 39. Retrieved from https://www.chronicle.com/article/underrepresented-students-benefit-most-from-engagement/#:~:text=Students%20who%20participate%20in%20collaborative,likely%20to%20remain%20in%20college.

Watkins, R., & Corry, M. (2007). *E-Learning companion: A student's guide to online success*. NY: Houghton Mifflin.

Xu, H., Li, Y., & Li, Y (2019). Using online applications to improve tone perception among l2 learners of Chinese. *Journal of Technology and Chinese Language Teaching, 10*(1), 26-56. Retrieved from http://www.tclt.us/journal/2019v10n1/xulili.pdf