International Journal of Web-Based Learning and Teaching Technologies
Volume 17 • Issue 6

Challenges Encountered During Synchronous Online Collaborative Writing via Google Docs

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ABSTRACT

This study investigated (1) the challenges encountered by a heterogeneous group of first year undergraduates during a synchronous online collaborative writing activity conducted through Google Classroom using Google Docs and (2) their perceptions of the pedagogical approach. Five sub-groups of undergraduates participated in the study, and their written transcripts were analysed for patterns of interaction in terms of equality and mutuality based on the Taxonomy of Writing Change Functions and Scaffolding Strategies. Data on learner perceptions were analysed for underlying themes. The findings, which were interpreted from the perspective of the Complex Dynamic Systems Theory, revealed that synchronous online collaboration is complex and challenging due to the dynamic patterns of interaction. This study concludes that Google Docs is a useful pedagogical tool and could be used for second language writing development despite the challenges. However, in transferring the findings to other second language learners or learning contexts, caution needs to be applied.

KEYWORDS

Complex Dynamic Systems Theory, English as a Second Language, Godwin-Jones, Google Classroom, Learner Perception, Li, Patterns of Interaction, Perception, Storch, Verspoor, Zhu

INTRODUCTION

In the higher education sector of Sri Lanka, with the recent introduction of Google Classroom, an increasing number of English as a second language (ESL) teachers of the Faculty of Management Studies and Commerce (FMSC) of a leading university have shown interest in using Google Docs, a web 2.0 application, for synchronous on-line collaborative writing.

Google docs is a very useful technology enhanced pedagogical tool (Abrams, 2019) that is simple and accessible. Through Google Docs, learners can interact, collaborate, share, and edit documents while teachers can track students collaborative learning in real time.

Since Google Docs is a useful tool and the interest in using it for teaching writing is apparent, the aim of this research was to conduct a study to investigate the problems/challenges of synchronous on-line collaborative writing when learners interact linguistically (Storch, 2002) in small groups to complete a writing task.

What does collaborative writing mean? There are many definitions of collaborative writing. The concept of collaborative writing has been broadly defined by Storch (2011) as "the joint production of a text by two or more writers" (p. 275). Allen, Atkinson, Morgan, Moore, and Snow (1987) defined collaborative writing as "collaborators producing a shared document, engaging in

DOI: 10.4018/IJWLTT.287554

substantive interaction about that document, and sharing decision-making power and responsibility for it" (p. 70; Yeh, 2014). Similarly, Dillenbourg (1999) described it as a situation in which "two or more participants learn or attempt to learn something together" (p. 1; El-Hamamsy, Johal, Asselborn, Nasir, & Dillenbourg, 2019) and outlined certain criteria for defining it. The criteria are interactivity, the degree to which interactivity influences the cognitive process of the participants; synchronicity, simultaneous participation in the writing process; and negotiability, which is arguing for one's standpoint, justifying, negotiating, and attempting to convince as opposed to imposing one's view. Fung's (2010) definition of collaboration is also similar to that of Allen et. al's (1987) and Dillenbourg's (1999). She described the main characteristics of collaboration as interaction among group members, arbitration, management of differences in ideas, and sharing of knowledge and skills.

Collaborative writing can be done synchronously or asynchronously. The current study investigated the challenges encountered by the learners while being involved in synchronous (Yim, Wang, Olson, Vu, & Warschauer, 2017) on-line writing. It is hoped that this investigation would be significant to the Faculty in which the research was undertaken, in particular, and the higher education institutes in Sri Lanka, in general, because much of students' writing in their personal and professional lives is on-line (Chun, Kern, & Smith, 2016) and synchronous on-line collaborative writing is fast gaining popularity as a promising new technique for instruction (Yim et al, 2017).

Research Questions

In order to investigate the problems/challenges that students encountered during the synchronous on-line collaborative writing process and their perceptions of the pedagogical approach, the following research questions were addressed:

1. What problems/challenges do learners encounter in linguistically interacting with group members during synchronous on-line collaborative writing through the Web 2.0 application, Google Docs?
2. How do students perceive synchronous on-line collaboration using Google Docs?

BACKGROUND

Many studies have been conducted on the use of Google Docs (Kessler, Bikowski, & Boggs, 2012) for second language learning. However, most of these studies have been conducted on asynchronous on-line collaboration in the use of wikis (Ducate, Anderson, Moreno, 2011). However, there are only a few studies that have investigated synchronous interaction in classroom-based L2 writing (Yanguas, 2019) specifically the challenges/problems that learners encounter in interacting with group members during the synchronous on-line collaborative writing process.

Research studies conducted on on-line collaborative writing reveal that it helps learners improve the productivity and quality of writing in terms of fluency and accuracy due to learner engagement and learner exposure to a great deal of linguistics input (Yeh, 2014; Ebadi & Rahimi, 2019), but it has also been found to be quite challenging, not bringing about the expected outcomes for second language learning (Nokes-Malach, Richey, & Gadgil, 2015).

Research informs us that some of the challenges that come with collaborative writing are learner anxiety due to not being able to claim ownership of the contribution made by learners to the task (Bradley, Lindström, & Rystedt, 2010); learner dominance or passivity (Meishar-Tal & Gorsky, 2010), non-conformity of learners to group norms (social loafing/ free-riding); and learner difference in style, pace of work (Strobl's, 2014), and different levels of language proficiency (Li & Zhu, 2017). Li and Zhu (2017), in their examination of the dynamic aspect of interaction in wiki-based collaborative writing, found that the degree of contribution towards the task depended on the language proficiency of the students. Learners (within the group) whose language proficiency was higher than the others tended to dominate the group activity. This shows that effective collaboration depends not merely on

one factor but on a range of factors which include learners' level of second language proficiency, type of tasks that learners have to complete, their attitude and motivation towards second language learning (Abrams, 2019), varying degrees of learner expectations, cultural issues and misunderstandings (Helm, 2015). Zheng and Warschauer warn against the literal interpretation of research findings, for "various mediating factors contribute to the degree and quality of interaction and collaboration, including task type, mode selection, participants' characteristics, learning styles and preferences" (2017, p. 63).

As for learner perception of on-line learning, Ebadi's and Rahimi (2019) investigated the perception of learners towards the effect of on-line synchronous dynamic assessment on academic writing skills and found that learners perceived it positively. This shows that on-line activities are perceived as beneficial by learners despite the challenges encountered .

The Theoretical Base of the Study

Since learners are diverse in terms of "age, aptitude, motivation, willingness to communicate, learner anxiety, emotion, beliefs, learning strategies" (Larsen-Freeman, 2018; Godwin-Jones, 2018a, p.13) and the challenges/issues prevalent in one learning context can be different from the issues in another learning context, the theoretical base of the study is a Complex Dynamic Systems (CDS) theory which stipulates that the behaviour of the learners cannot be predicted in a consistent manner because language systems differ in their initial conditions (Verspoor, 2008). To add to this, according to research, in on-line learning environments, "additional factors come into play, including aptitude or comfort level in using digital communication tools and services, newbie or habitué status in on-line communities, ability to cope with multilingualism, mode of access (mobile, voice commands), context of access (standing in line at the grocery store versus relaxing at home) and associated degree of focus or interest" (Godwin-Jones, 2018a, pp. 13-14). This makes second language learning more of an individualised process (Lowie, Van Dijk, Chan, & Verspoor, 2017) with learners having different learning trajectories (Lowie & Verspoor, 2019).

Thus, variation in learners due to the dynamic interactions of the sub-systems of the language leading to fluctuations of any part of the language system from one moment to another, and variability between the learners due to differences in their initial conditions such as "language aptitude, learner motivation, learning styles, baseline proficiency, learner strategies (Dörnyei & Skehan, 2003; cf. Rimrott, 2010, p. 29)" are considered salient features in CDS theory and second language development (Verspoor, Lowie, & Van Dijk, 2008). Based on these phenomena, Verspoor, Schmid, & Xu (2012) state that teachers shouldn't expect learners to learn at the same path or pace, as they learn through trial and error. Hence, in interpreting the result, the fact that language development is not just the complexity of language or of the language development process but also the complexity of the individual learner (Dörnyei, 2017) should be considered.

METHOD

Respondents

One intact group of first year undergraduates of a management faculty of a leading university in Sri Lanka whose average age was twenty years (the average age of a Sri Lankan undergraduate at the time of enrolment to a state university is twenty years) participated in the study. These undergraduates were diverse in terms of English language proficiency. Around 22% of the participants had obtained less than twenty marks for the general English paper at the national university qualifying examination, the G.C.E. (Advanced Level) examination 2018 while 33% between twenty-one and forty marks; 27% between forty-one and sixty marks; 13% between sixty-one and eighty marks; and 1% above eighty one marks. The first language of 91% of the participants is Sinhala (the language spoken by 75% of the population of Sri Lanka) and of 9% is Tamil (Tamil is the second national language of the country and is spoken by the Tamil and Muslim communities which comprise about 20% of the population).

Generally, about one thousand one hundred undergraduates are annually enrolled to the twelve undergraduate degree programs offered by this management faculty. In the first and second semesters of the first year of their degree program, all the undergraduates follow ten course units, which are credit courses. Business communication I and II are two of the course units that the undergraduates follow. For Business Communication I and II, the one thousand one hundred students are divided, according to their registration numbers, into groups of approximately thirty five to forty students each.

Sampling Procedure

The participants were from a single ESL class of the researcher (The researcher was the lecturer that taught Business Communication II to the group). The class consisted of 37 students out of which twenty-three were females and fourteen were males. The 37 students were divided into twelve sub-groups, seven sub-groups of four students each and three sub-groups of three students each. The sub-grouping was done according to the students' registration numbers. Since the students were sub-grouped according to their registration numbers, some sub-groups had both males and females while other groups had either all males or all females.

In this study, factors such as gender and group size were not considered as the effect of the heterogeneity of the groups differs from one task to another due to the complex nature of their (learners') interaction (Dillenbourg, Baker, Blaye & O'Malley, 1995).

The synchronous on-line collaborative writing activity was done by the whole class, but from the entire data set only five sets of data were taken for analysis, as the other groups didn't want their written work closely analysed for research. These students were quite representative in terms of age (an average age of an undergraduate is 20 years) and university entry qualification (only G.C.E. [Advanced Level] qualified candidates can enter the national universities of Sri Lanka) but differed in terms of language proficiency. For analysis and reporting purposes, the five groups are referred to as Groups 1,2,3,4,5, and the members of the groups are known by their Group Number and the order in which they had contributed. For example, the first contributor of Group 1 is referred to as Participant 1 of Group 1. Table 1 gives the number of participants in each of the five groups.

Table 1. Number of participants in each group

	Number of Participants
Group 1	03
Group 2	04
Group 3	03
Group 4	04
Group 5	03

Instruments/Intervention/Measures

The study fell within the normal course curriculum, and the content of the course was not altered. It was conducted during the second semester of the first year.

The researcher monitored the interaction of participants by means of the writing and editing feature made available by Google Docs (Ebadi & Rahimi, 2019; Godwin, 2018b), a feature that could be used to track collaborative writing. The researcher requested the learners to invite her as an on-line collaborator so that she would also be able to view their collaborative trajectory, such as changes in written participation (e.g., amount of writing, revision) across different phases of collaboration while giving feedback on their writing.

In addition, the learners were given an open ended question to find out what they felt about synchronous on-line collaborative writing through Google Docs. The open-ended question that was given to the learners was, *"What do you think of synchronous on-line collaborative writing?"* The learners were each given a sheet of paper and asked to put down their idea/s in writing in either English, Sinhala, or Tamil language.

Procedure

Lectures, during the semester, were held on Mondays and Wednesdays from 8 a.m. to 10 a.m. The learners were taken to the language laboratory on eight consecutive Wednesdays for the treatment. Each student was assigned a PC and a 17" LCD monitor. The learners stayed in the same group throughout the research period but were not necessarily sitting next to each other. They only interacted on-line through Google Docs.

The patterns of interaction of the participants were analysed through a writing task. The task given to them was an essay on the topic "University Life". The reason why this topic was given was because the participants were familiar with it and wouldn't be stuck for points/ideas.

The participants were asked to write the essay in three stages. In stage one, they wrote the introduction of the essay. In stage two, they wrote the three body paragraphs of the essay, and in stage three, they wrote the conclusion.

One of the units that is taught in the second semester of the first year is essay writing. In the unit on essay writing, students learn how to write a five paragraphed essay which includes the introductory paragraph, three body paragraphs, and a concluding paragraph. About four weeks of the semester, which means eight two hour sessions, are usually allocated in the time-table for this unit.

In general, by the time the students come to the second semester of the first year, they have already been taught how to write a good paragraph with a topic sentence and supporting ideas. Thus, in the second semester, the teacher mainly focuses on the introduction and the conclusion and only revises the topic /main idea sentence and the supporting ideas in the body paragraphs. Once the teacher has shown the students how to write an essay with a proper introduction, three body paragraphs, and a conclusion using a simple and familiar topic, the teacher gets the students to write in groups and then individually on a familiar topic. Even though the main aim of the lesson is to teach students to write a well organised essay that is free of grammatical errors, experience dictates that essay writing is quite challenging for ESL students. Hence, students are encouraged to write in three stages. At the end of each stage (the introduction, the body paragraphs, and the conclusion) the teacher gives feedback on the text produced.

Prior to the research proper, the participants were given a training on the use of Google Docs. After the training session, the participants were given an opportunity to practice the use of Google Docs for synchronous on-line writing. During the practice session, the participants attempted, both individually and in pairs, a guided activity on letter writing, a lesson from the second semester course unit. During the practice session, the teacher/researcher also emphasised on the importance of taking advantage of each member's strength, of interacting, of working together, and of negotiating the writing process (Bikowski & Vithanage, 2016; Posner & Baecker, 1992)

Since synchronous collaborative writing through Google Docs is a new concept for both the teachers and the L2 learners in Sri Lanka, the practice sessions were very useful. Many research studies have emphasised on the significance of training learners for successful engagement in collocated writing (Storch, 2005). Storch (2005), for example, states that a "re-conceptualization of classroom teaching" might be essential for L2 learners to be prepared for collaborative writing (p. 169). Also, Bikowski and Vithanage (2016) state that for collaboration to be successful learners should be trained because collaborative learning could be challenging for some of them.

Thus, the research proper was conducted after the participants had performed several on-line tasks, both individually and collaboratively.

As for this study, out of the sixteen hours that were set aside, approximately four hours were spent on explanations and discussions of the lesson by the researcher; another four hours were spent by the participants on practising the use of Google Docs for on-line collaborative writing; and eight hours for synchronous on-line collaborative writing (by the participants).

At the end of the collaborative writing activity, the participants expressed their perceptions towards the use Google Docs. The time taken to complete this task ranged from five to 10 minutes.

Data Analysis

In order to identify the challenges encountered during the synchronous on-line collaborative writing activity, the co-constructed essays obtained from the editing functionality available in Google Docs were analysed for patterns of interaction (to examine how group members within each group participated in the synchronous on-line collaborative activity) in terms of mutuality and equality as used initially by Damon and Phelps (1989), then by Storch (2002, 2013) and Li and Zhu (2017). Storch (2002, 2013) conceptualised equality and mutuality for collaborative writing tasks by analysing peer talk transcripts in relation to "word count, turn count, and language functions" (Li & Zhu, 2017, p. 99). The concept of equality was referred to by her as the equal division of turns, equal participation in the task, and equal extent of control over the direction of the task; and mutuality as peer engagement with the contribution made by each other which appears in such language functions as agreement, correction, and clarification. Li and Zhu (2017) interpreted equality in terms of each member's "language function instances" and "writing change function instances", and mutuality in terms of "initiating versus responding language functions", "self-writing change functions versus other writing change functions" and "scaffolding strategies" (p. 102). They used the terms low and high to determine the levels of mutuality and equality. In this study, the written transcripts of the members of the groups were analysed for equality and mutuality using as a guideline the analytical procedures adopted by Li and Zhu (2017). Since the groups only collaborated on-line through Google classroom, the analysis of the patterns of interactions among the members of the five groups solely depended on the writing change functions and scaffolding strategies that the participants adopted. The written transcripts of the members of the groups were analysed for Writing Change Functions and Scaffolding Strategies based on the Taxonomy of Writing Change Functions and Scaffolding Strategies provided by Li and Zhu (2017, pp. 119-120).

The transcripts produced by the participants were analysed by two independent analysts, the researcher and a colleague, who is also a second language teacher attached to the same Faculty as the researcher. Since there were only five transcripts, all five transcripts were read several times and detailed notes made by the two analysts independently. Then, the two analysts reviewed the notes made, eliminated any redundancies, discussed the differences, and resolved them. Next, the "dominant patterns of interaction" (Storch 2002, p. 126) as predetermined by Li and Zhu (2017) were identified. Li and Zhu (2017) identified three patterns of interaction. Table 2 below displays the three patterns of interaction as identified by them .

Table 2. Patterns of interaction

	Patterns of Interaction		
	Collectively Contributing/Mutually Supportive	**Authoritative/Responsive**	**Dominant/Withdrawn**
Equality	High	Low	Low
Mutuality	High	High	Low

(Source: Li and Zhu, 2017, p. 99)

As for learner perception of synchronous on-line collaborative writing, the responses given by the participants to the open-ended questions were first type written and then analysed for underlying themes by the same analysts who analysed the written transcripts of the participants to determine the patterns of interaction of the five groups. Before analysing the data, the two analysts met and discussed as to how they would carry out the analysis. It was decided to code/label the underlying themes. After the analysis, the two analysts met again to review the codes and eliminate redundant and less useful codes. Then, a list of relevant data was constructed and grouped under topics: Positive, Negative, and Neither Positive nor Negative.

FINDINGS/RESULTS

This study examined the challenges/issues faced by the groups during the synchronous on-line collaboration and learners' perception of synchronous on-line collaborative writing through Google Classroom using Google Docs. The findings are summarized in accordance with the two research questions addressed in the paper.

Research Question 1: What problems/challenges do learners encounter in linguistically interacting with group members during synchronous on-line collaborative writing through the Web 2.0 application, Google Docs?

Group One

This group comprised three members, but the writing trajectory of the participants indicate that participants 1 and 3 have actively engaged in the group activity taking over from where one had stopped, mutually reacting and scaffolding while participant 2 has made minimal contribution but appears to have been engaged in the task by making a slight correction to the text on one instance which could be referred to as 'other writing change function'. Even though the contribution made by the three members of the group are not equal as evident in the writing change functions, they have engaged in one another's ideas. The pattern of interaction displayed by the members of this group could be referred to as Authoritative/Responsive. Table 3 shows the levels of equality, mutuality, and the pattern of interaction of the participants of group one.

Table 3. Levels of equality, mutuality, and pattern of interaction of participants of group one

Participants	Equality		Mutuality					Pattern of Interaction
	Language Function Instances	Writing Function Instances	Initiating Language Functions	Responding Language Functions	Self-Writing Change Function	Other Writing Change Function	Scaffolding	
Participant 01	-	2	-	-	2	-	1	Authoritative/Responsive
Participant 02	-	1	-	-	-	1	-	
Participant 03	-	1	-	-	1	-	1	

Group Two

This group comprised four members. The analysis of the written text of the participants manifest that all four members have actively engaged in the construction of the text, mutually reacting and scaffolding

taking over from where one had stopped. Even though the participants have not contributed equally as evident in the writing change functions, the pattern of contribution displayed by the members of this group is more collaborative and mutually supportive. Table 4 shows the levels of equality, mutuality, and the pattern of interaction of the participants of group two..

Table 4. Levels of equality, mutuality, and the pattern of interaction of the participants of group two

Participants	Equality		Mutuality					Pattern of Interaction
	Language Function Instances	Writing Function Instances	Initiating Language Functions	Responding Language Functions	Self-Writing Change Function	Other Writing Change Function	Scaffolding	
Participant 01	-	3	-	-	3	-	2	Collective/Mutually Supportive
Participant 02	-	7	-	-	7	-	7	
Participant 03	-	6	-	-	6	-	6	
Participant 04	-	7	-	-	7	-	7	

Group Three

Group three comprised three members, but the writing task has been done by just one member of the group (participant 1) . There is no evidence of any contribution or engagement in the task by the other two members of the group. In terms of equality and mutuality, there has been hardly any among the participants of this group. The pattern of interaction could be referred to as Dominant/Withdrawn with two members of the groups not contributing in any way. Table 5 shows the levels of equality, mutuality, and the pattern of interaction of the participants of group three.

Table 5. Levels of equality, mutuality, and the pattern of interaction of the participants of group three

Participants	Equality		Mutuality					Pattern of Interaction
	Language Function Instances	Writing Function Instances	Initiating Language Functions	Responding Language Functions	Self-Writing Change Function	Other Writing Change Function	Scaffolding	
Participant 01	-	1	-	-	1	-	-	Dominant/ Withdrawn
Participant 02	-	-	-	-	-	-	-	
Participant 03	-	-	-	-	-	-	-	

Group 4

Group four comprised four members, but the writing trajectory of the participants indicate that all participants have actively engaged in and contributed to the group activity taking over from where one had stopped, mutually reacting and scaffolding with participant 2 also making an "other writing change function". However, participant 3 has taken on an authoritative role contributing more than the other members of the group. Despite this, learner engagement through self-writing change functions, other writing change functions, and mutual scaffolding indicate high mutuality among the participants of this group. Hence, the pattern of contribution in this groups can be labelled as Authoritative/Responsive. Table 6 shows the levels of equality, mutuality, and the pattern of interaction of the participants of group four.

Table 6. Levels of equality, mutuality, and the pattern of interaction of the participants of group four

Participants	Equality		Mutuality					Pattern of Interaction
	Language Function Instances	Writing Function Instances	Initiating Language Functions	Responding Language Functions	Self-Writing Change Function	Other Writing Change Function	Scaffolding	
Participant 01	-	5	-	-	5	-	4	Authoritative/Responsive
Participant 02	-	8	-	-	7	1	7	
Participant 03	-	12	-	-	12	-	12	
Participant 04	-	6	-	-	6	-	6	

Group 5

Group number 5 consisted of three members. In this group, participant 2 has contributed more than the other two members in terms of 'self writing change function', 'other writing change function', and mutual 'scaffolding'. However, participants 1 and 3 have also contributed to the writing task actively engaging and being in control of the task. In terms of equality, mutuality, and scaffolding, equality can be referred to as moderate while mutuality is high with all three participants making 'self writing change functions' and two making 'other writing change functions'. There is also evidence of mutual scaffolding in the text. The pattern of interaction this group is more of a collective/mutually supportive nature. Table 7 shows the levels of equality, mutuality, and the pattern of interaction of the participants of group five.

Table 7. Levels of equality, mutuality, and the pattern of interaction of the participants of group five

Participants	Word Count	Turn Count	Equality		Mutuality					Pattern of Interaction
			Language Function Instances	Writing Function Instances	Initiating Language Functions	Responding Language Functions	Self-Writing Change Function	Other Writing Change Function	Scaffolding	Collective/ Mutually Supportive
Participant 01	165	9	-	9	-	-	9	-	8	
Participant 02	103	12	-	12	-	-	11	1	11	
Participant 03	25	9	-	9	-	-	8	1	8	

The overall response to research question number two was positive. The majority of the students stated that their motivation increased because of the collaborative nature of the activity. They also mentioned that it was a new experience and should be continued. Some of the responses given by the students are summarised by the researcher below. Since students were allowed to respond in English, Sinhala, or Tamil, about 50% of the students had used Sinhala. The rest of the students had used English. The Sinhala responses were translated by the researcher and then given to a colleague to double check if anything important had been left out.

The responses given by the students, in general, are given below in italics:

- **Positive Comments:**
  - ◇ *Google classroom is a good method to learn.*
  - ◇ *It's different, and we like it.*
  - ◇ *We are motivated to learn.*
  - ◇ *We find it easy to learn because the work could be shared.*
  - ◇ *We could also help each other. It's interesting as well. Collaborative writing is a good and useful way to improve our English.*
  - ◇ *Writing on-line as a group is better than doing group work in class. We can learn from one another.*
  - ◇ *Since the teacher was monitoring our work on-line, we tried to do well.*
- **Negative Comments:**
  - ◇ *Due to lack of computer literacy of some students, the time we had to learn English was relatively less. We miss talking to our friends.*
  - ◇ *My suggestions were not considered by my group.*
  - ◇ *I did all the writing but the whole group took credit for task completion.*

DISCUSSION

This study attempted to find answers to two questions with a view to making the synchronous on-line collaborative writing activity a productive one for the undergraduates of the Faculty in which the study was conducted, in particular, and the higher education institutes in Sri Lanka, in general.

The first question was to investigate the problems/challenges that might be encountered when interacting linguistically with group members during synchronous on-line collaborative writing through the Web 2.0 application, Google Docs. The analysis of the written texts of the participants reveal that not all learners have fully participated in the synchronous on-line collaborative process. There had been different degrees of interaction both in terms of equality and mutuality. As mentioned in the literature review, this aligns with the findings of Lowie & Verspoor (2018) who revealed that the learning trajectories of one leaner is different from the other because of the complexity and challenges of on-line collaboration and of Godwin's (2018), who said that on-line learning experience is complex and unpredictable. The findings of the current study are also consistent with the tenets of the Complex Dynamic Systems Theory according to which language learning is not a static but a dynamic process in which the dynamic interactions of the sub-systems of language lead to a fluctuation of the individual learner's language subsystem thereby making the language learning experience variable (Verspoor, 2008). However, with a small sample size, caution must be applied since the findings might not be transferable to other second language learners or second language learning contexts.

Another possible explanation for the different levels of interaction might be attributed to the inter student variation during the learning process due to the dynamic interaction of the sub-systems of language (Verspoor, 2008). In a heterogeneous group, some learners are more motivated than others; some are more proficient than others resulting in some learners' pace of participation being slower than that of others due to the dynamic nature of the language learning process (Verspoor, 2008). Thus, these findings are also in line with the Complex Dynamic Systems Theory. Besides, on-line language

learning is complex and unpredictable (Godwin, 2018) and challenging due to the different learning trajectories of the learners (Lowie & Verspoor, 2018). In addition, as Zen & Warchauer warned, the involvement of factors such as type of task, characteristics of participants, their learning styles and preferences contribute to the "degree and quality of interaction and collaboration" (2017, p.63).

The second question in this research was to find out the perceptions of learners of synchronous on-line collaborative writing. The majority of the learners perceived the approach positively; however, in their response to the open-ended question, they also expressed their concern about not being able to claim ownership for their work and their suggestions being ignored by the members of the group. These findings confirm with the previous findings of Bradley, Lindstrom, & Rystedt (2010) and Meishar-Tal & Gorsky's (2010) respectively. The aforementioned researchers referred to these as challenges of collaborative writing. Even though these are considered challenges, as for the tenets of the Complex Dynamics Systems Theory and the findings of Li & Zhu (2017), they are characteristics of the dynamic nature of student interaction. Students also mentioned that they had wasted a lot of class time due the lack of typing skills and computer illiteracy of some students in the group. This issue is mainly due to the unequal distribution of educational facilities in Sri Lanka and could easily be addressed by providing the students time for sufficient practice in the use of technology before the implementation of on-line collaborative writing in the university. Moreover, some of the issues/problems/challenges such a varying degree of participation and internet loafing could to some extent be controlled by the teacher through the writing and editing functionality of Google Docs. In fact, learners had also made it a point to mention that it was because they were being monitored that they attempted to collaborate and not loaf on the internet.

As for their concern about not being able to talk to friends (missing the personal touch), learners can indeed interact, synchronise, and negotiate on-line with their group members. Probably, as they become more experienced with on-line collaborative writing, they would realise these possibilities.

In addition, some practical issues that emerged during the research were that learners tended to waste a lot of class time setting up the machine for on-line collaborative writing, in not being able to keep up with the other collaborators due to computer illiteracy[1]and lack of typing skills, and lack of experience in on-line collaborative writing.

RECOMMENDATIONS

The recommendations coming out of the research are that, despite the challenges/problems of synchronous on-line collaboration through Google Classroom using Google Docs, it should be introduced to the students of the Faculty for ESL writing development and learners should be encouraged to depend on one another positively and be accountable as individuals because it is a user friendly and useful pedagogical tool that has tremendous potential for collaborative second language learning. Since language learning is a dynamic process, the varying degree of interaction by the learners in carrying out the task assigned to them should be considered as a regular phenomenon and should not be considered a challenge or a problem. Further, the findings cannot and should not be generalised across research contexts, task types, or proficiency levels because of the difference in the initial conditions of both participants and the research context.

CONCLUSION

This study set out to determine the issues/problems/challenges of synchronous on-line collaborative writing through Google Classroom using the social software Google Docs and learner perceptions of the instructional approach in order to effectively integrate on-line collaborative writing as part of ESL instructions.

The study has shown that Google Docs could be a very useful pedagogical tool for synchronous on-line collaborative writing since the learners, in general, are very positive towards it. The issue/

problems that were encountered are common to any language teaching situation and is attributed to the dynamic nature of the second language learners who come with different initial conditions.

The limitations of this study are that it was conducted only with one intact group of students by the lecturer in charge of the group. It would have been better if the study had been conducted with more groups with multiple observers to address bias. In addition, this study focused on only one task (essay writing). Clearly, more research needs to be conducted with a larger sample size, under different learning contexts on a variety of tasks, over a longer period of time. Other questions that need to be addressed are if there is a relationship between the nature of the task and pattern of interaction; if language proficiency of the learners affected the pattern of interaction; and if group interaction had an effect on the individual performance of the learners and their learning outcomes.

On the basis of the promising findings presented in this paper, the pedagogical implication of the study is that Google Docs could be considered a useful tool for the development of on-line collaborative writing despite the technical issues/problems. However, caution must be applied in transferring the findings to other second language learners or second language learning contexts, for language development is not just the complexity of language or of the language development process but also the complexity of the individual learner (Dörnyei, 2017).

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ENDNOTE

[1] According to the Department of Census and Statistics, Sri Lanka, the overall digital literacy, which is defined as the ability to use computer, lap top, tablet or smartphone on his/her own, of 20 to 24 year old was 77.6% while computer literacy, which is the ability to use a computer on his or her own, was only 58.7%, in 2018.

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