

Implementing imagination-based pedagogies in a web-based Computer Supported Collaborative Language Learning writing activity: Orchestration issues

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Abstract— Computer-Supported Collaborative Language Learning (CSCL) has been proved to offer many advantages to language learners. However, teachers argue that the use of complicated pedagogies such as imagination-based techniques in combination with innovative technologies lead to a “complex ecosystem” in which many issues of management appear. This paper examines how students’ motivation and engagement are influenced when implementing imagination-based pedagogies in a web-based Computer-Supported Collaborative Language Learning writing activity with shared orchestration load.

Keywords—CSCL, CALL, language learning, imagination-based pedagogies, orchestration

I. INTRODUCTION

The field of Computer Assisted Language Learning (CALL) has shown great development the last decades and foreign language teachers often use technology during their lessons to increase students’ motivation. Moreover, the Communicative Language Teaching (CLT) movement, which is widely used, supports the use of CSCL activities that promote the communication and collaboration among students. More specifically, collaborative learning has been considered to be one of the most effective instructional strategies in language learning since it “has a ‘social constructivist’ philosophical base, which views learning as construction of knowledge within a social context and which therefore encourages acculturation of individuals into a learning community” [1], [2].

Recent studies in the field have shown that collaboration benefits students’ learning performance since students feel more comfortable when interacting with their peers. Collaborative learning improves communication and negotiation skills and allows even the shy and slow students to participate more actively in their terms [3], [4], [5]. Other findings have shown that CSCL plays important role for both high-ability and low-ability second language learners because it promotes communication among students and scaffolds more productive interactions [6]. Furthermore, the use of collaboration makes learning process more realistic and simulates the natural conversations taking place outside the classroom. This allows learners to exchange ideas and opinions without time and space limits and improves the quality of learning experiences [7]. Researchers have also concluded that students are more motivated when they are to

work in groups. Language learners in particular need to use the target language to interact with each other, which in turn improves their language skills through authentic learning materials [8]. Finally, another positive result of collaboration is that learners usually exchange information in social and meaningful context, which allows assimilating new information into the existing schemata of the learners and as a result it improves performance in the target language [9]. All the above benefits demonstrate that collaboration seems to enhance students’ motivation and helps to achieve the desirable learning outcomes [10] and justifies why Wen, Prieto and Dillenbourg [11] have recently encouraged the scientific community of CSCL to investigate and explore the potentials of collaborative language learning.

However, the majority of CSCL activities usually fail to effectively incorporate rewarding collaboration in physical, virtual or blended classrooms mostly because teachers often assume that a technological innovation offered by a collaborative environment is enough to guarantee effective collaboration among students and eventually an improved learning outcome [12], [13]. However, it has been proved that it is ineffective to simply place students in a computer-based environment and expect them to engage in collaborative English communication [14].

On the other hand, imagination-based pedagogies have always played an important role in language learning environments. Techniques such as storytelling, creative play, poems and verses, drawing and painting have been an integrated part in innovative language classrooms. A plethora of studies has shown the many benefits that these pedagogies have on students’ motivation and learning performance [15], [16], [17].

In spite of the many advantages of these innovative techniques, teachers are rather reluctant to use them in real classroom environments. Teachers argue that the use of complicated pedagogies in the classroom in combination with innovative technologies lead to the so called “complex ecosystem” in which many complicated issues of management appear. Consequently, a viable solution in management problems should be found before new technologies can be incorporated in real classrooms. In an effort to understand the causes and the possible solutions to these problems, the term orchestration has been used to

describe how a teacher manages, in real time, multi-layered activities in a multi-constraints context [18].

Finally, in recent studies, the term orchestration load is used to describe the effort that teachers spend in coordinating multiple activities and learning processes. Researchers sometimes use this term in analogy to cognitive load: a useful construct related to individual usability, which has been studied thoroughly in cognitive science, educational psychology and human computer interaction [19], [20].

This paper aims to examine the orchestration challenges that occur when implementing imagination-based pedagogies in a web-based Computer-Supported Collaborative Language Learning writing activity and how this kind of activities may influence students' motivation and engagement, especially when the orchestration load is shared between teacher and students and the learning process continues beyond the 45min lesson, as homework [21].

II. RESEARCH QUESTIONS

More specifically, the present paper will discuss the following research questions:

- Is there a significant correlation between students' involvement in orchestrating design of CSCLL activities and students' motivation and engagement in learning?
- To what extent and in what ways does students' social interaction (SSI), such as teacher-students relationship, student-student relationship and the aroused emotions, affect students' motivation and engagement when it comes to CSCLL activities?
- Can the combination of orchestration strategies and innovative pedagogies (such as inquiry-based and imagination-based learning) have a significant impact on the student learning outcome (i.e., a higher level of language proficiency)?

III. METHODOLOGY

The methodology used in this research is described below:

A. Participants

The participants of this study were fifteen students of English as a foreign language in intermediate and upper-intermediate level (from B1 up to B2 level in CEFR framework) and were teenagers aged from 14 to 16 years. All the participants were divided into two groups: the control group and the experimental one. The control group consisted of nine students, while the experimental one consisted of six students working in three pairs.

B. Design

Both groups were presented with a 45 min lesson where a storytelling technique was used in order to introduce the students to the topic of the writing assignment that followed. Since the control group followed traditional methods, a conventional narration technique was used. On the other hand, the experimental group used the Waldorf storytelling technique implementing a more engaging procedure [21].

Afterwards, students of both groups had to complete some vocabulary and grammar exercises while they collaborated actively in the classroom, mostly by using dialogs and games. The control group used dialogs and games in a conventional way by using exercises from students' textbooks (e.g. role plays and drills). On the contrary, in the experimental group, dialogs and games were implemented through a more imagination-based approach; students used creative play, painting, movement and handcrafts. These creative literacy practices allowed 'learners to assume from the beginning the role of creative subjects' [22].

In both groups students were presented with the exercises they had to complete and then were given some time to complete them in their own pace. The teacher held the role of "conductor" and facilitator while the researcher monitored the process and kept notes.

After the end of that first lesson, the students of the control group were asked to write a story with a given topic based on the story they had already examined in the classroom.

However, the members of the experimental group had a second 45min lesson in which they were presented with the VLE platform and familiarized with its function. Then, students of this group were asked to use the chat and the wiki tools of the platform in order to write collaboratively a story with the same given topic. That time, though, students were totally free to orchestrate the activity by themselves. They had to assign roles on their own and plan the way they were going to work (shared orchestration load). After completing the assignment, students were given a questionnaire to answer and evaluate their experience. The data collected by these questionnaires were analysed quantitatively.

The writing extracts of both groups were assessed regarding language proficiency, in means of fluency, grammar, vocabulary range, cohesion and content. The data collected by this procedure were evaluated quantitatively.

The main objective of this study was to identify if students' motivation and engagement was increased when they actively took part in the orchestration design. Moreover, we examined whether the learning outcome was affected when students worked collaboratively. Table 1 below shows the variables used in the planning process of this experiment.

TABLE I. INDEPENDENT AND DEPENDENT VARIABLES

Independent Variables	Dependent Variables
Individual writing	Students' motivation
Online, collaborative writing	Students' engagement
Shared orchestration load	Learning outcome (fluency, grammar, vocabulary range, cohesion and content)

IV. FINDINGS

The findings of the present study are described below:

A. Correlation between students' involvement in orchestrating design of CSCLL activities and students' motivation and engagement.

In general, students answered that they were positively influenced by the fact that the activity was computer based, collaborative and innovative. The majority of the students

(83%) stated that the activity helped them use their imagination and the fact that the lesson allowed them to be creative made them more willing to participate. Moreover, the fact that students planned the writing activity by their own means had a positive impact on their motivation and engagement. Half of the students answered that they were highly motivated by this fact, while the other half stated that they were somehow positively influenced. Consequently, the correlation between students' involvement in orchestration (shared orchestration load) and their motivation and engagement with the learning process is significant.

B. Students' social interaction, students' motivation and engagement in CSCLL activities.

Regarding students' interaction, the sense of belonging in a group was highly ranked by the students who answered the questionnaire. Five out of the six participants answered that they were highly motivated to complete the activity by the fact that they were feeling active members of a group. Besides, the majority of the students (83,3%) stated that they felt comfortable among their peers and that the activity helped them become more sociable; both facts influenced positively students' motivation according to their responses. Only one student claimed that he/she felt anxiety due to the necessary collaboration and that he/she would prefer to be involved in an individual task. However, none of the participants mentioned that they felt stressed due to the lack of prior planning and clear instructions on how to complete their tasks.

C. Student learning outcome

In order to evaluate the learning outcome of the activity in both groups, the texts of the students were assessed by their teachers and analysed quantitatively with reference to their fluency, grammar, vocabulary range, cohesion and content. The descriptive statistics suggest that the collaborative texts achieve higher levels of fluency, grammar, vocabulary range and content but not of cohesion, as shown in Table II below. Possible statistical significance was explored by a t-test on comparison of the means of the two groups which showed that the difference in fluency, vocabulary range, cohesion and content is statistically significant but not in grammar. Hence, we conclude that the learning outcome is overall improved in terms of fluency, vocabulary range and content when the activity is performed collaboratively using imagination-based techniques.

TABLE II. QUANTITATIVE RESULTS OF THE LEARNING OUTCOME FOR INDIVIDUAL AND COLLABORATIVE GROUPS

	Online CSCLL				Individual			
	Min	Max	Mean	Std.D.	Min	Max	Mean	Std.D.
Fluency	4	5	4,57	,535	3	5	3,78	,667
Grammar	4	5	4,14	,378	4	4	4,00	,000
Voc. R.	3	4	3,71	,488	3	4	3,44	,527
Cohesion	2	4	3,14	,690	3	5	4,00	,500
Content	3	5	4,14	,690	3	5	4,00	,866
L. Out.	3,4	4,4	3,943	,3952	3,2	4,4	3,844	,3844

D. Orchestration challenges

Finally, with the use of the revised "5+3" conceptual framework for orchestration in learning technology research [23] the orchestration challenges that occurred during the collaborative process were identified by means of observation and were qualitatively analysed. Following the

"5+3" framework the orchestration issues were divided in three main categories: the entailed activities, the performing actors and the background. Regarding the activities there were no management problems mentioned. With a reference to the actors, some students had difficulty in expressing themselves accurately in the foreign language and particularly one pair had many problems in their communication. Regarding technology, the chat tool did not support an alert system and as a result an amount of time was wasted while students were waiting their peers' answers. Finally, some orchestration background constraints appeared: students spent extra time to familiarize with the VLE and to organize the activity and share responsibilities. Moreover, there was space limitation due to the capacity of the computer lab and proper planning was necessary in advance.

V. CONCLUSION AND FUTURE WORK

This study examined the orchestration challenges that occurred when implementing imagination-based pedagogies in a web-based Computer-Supported Collaborative Language Learning writing activity and how students' motivation and engagement were influenced in such activities when orchestration load is shared. The results of the study provide some evidence that even though there are many management problems occurring, students valued positively the collaborative activity and claimed that it increased their motivation and participation while it made the lesson more interesting. Moreover, students stated that imagination-based pedagogies had also a positive impact on their motivation and engagement. Finally, the learning outcome of the CSCLL activity relatively to the conventional one was improved in many aspects and only the cohesion of the texts was influenced negatively.

The results of the current research are quite promising for the benefits that collaborative language learning activities combined with imagination-based techniques along with shared orchestration load may have in the general learning outcome. Consequently a bigger scale experiment with larger sample and a further division to the experimental group (teacher and student orchestration load) in a longer time frame has already been planned and is due to be carried out soon. Further research will help us understand the orchestration constraints that should be taken into account and how both researchers and teachers can overcome them.

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