Collaborative Teaching & learning strategies: Developing, Implementing and Analyzing Wikis and Forums in e-Learning Environments

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Abstract: *This study looks into the collaborative pedagogical strategies employed in an e-learning course, "Learning and Teaching Portuguese as a Non Native Language", promoted by a partnership between the Coimbra University Distance Learning Project and the Camões Institute. Data analysis focuses on the students' interactions during a group activity, while using wiki and forum tools. Since we aim to understand how to design and stimulate discussion and collaborative work in order to induce engagement and knowledge creation, a qualitative methodological approach was chosen for data analysis.*

Key words: *Collaborative strategies; wikis; forums; e-learning*

INTRODUCTION

Educational contexts are increasingly challenging due to the diversity of solutions offered by technology. Besides knowing how to operate with technology, learners also need to be prepared for higher-order skills to be able to work in online collaborative teams where information is shared and knowledge is attained collaboratively [3].

While both "cooperative" learning and "collaborative" learning are driven by the existence of a common goal, the degree of learners' autonomy and of instructor/teacher control tends to differ in each case. When learners display high autonomy and cognitive maturity, the group's common goal is preferably attained through collaboration, rather than cooperation. Cooperation is based on the distribution of different responsibilities to each member of the group, but collaboration involves coordination through interaction and negotiated consensus aiming at a common goal. Although interdependence is a defining property of both concepts, in cooperation attainment of the common goal depends essentially on completion of individual tasks by each member of the group, while collaboration implies relational involvement [3]. There are several tools to support group work in virtual learning environments, such as forums or wikis.

Discussion forums are one of the major tools for promoting peer interaction and collaborative learning in online learning environments [5]. Moreover, some studies [2] suggest that voluntarily engaging in online discussion forums contributes to students' positive examination results. Wikis are yet another web communication tool that can enable students to engage in learning with others [6]. Wikis can support the dissemination of information, promote the exchange of ideas, and facilitate group interaction. Furthermore, wikis can be used to create a set of documents that reflect the shared knowledge of the learning accomplished by the group [1].

LEARNING AND TEACHING PORTUGUESE AS A NON NATIVE LANGUAGE (LTPNNL): PRESENTING THE COURSE

Data analyzed in the present study was generated during one of the collaborative activities of the 8th edition (running from March 15 to May 6, 2016) of the LTPNNL course promoted by the Coimbra University Distance Learning project and the Camões Institute. This 50 hours course was designed as a response to the basic needs of a diverse group of professionals working in the field of PNNL. Delivered in the LMS Moodle, this course is divided into four sequential topics with gradual access. It articulates active and expository methods. The course activity plan was designed as to combine various types of activities, both stimulating the students' autonomous work through individual activities - e.g., multiple choice/true or false questionnaires and file submissions – and promoting collaborative work - e.g., forums and wikis.

Characterizing the activity

The collaborative activity under scrutiny falls under the third topic of the course: "Interlanguage and fossilization". The activity, "Identification of Nominal Gender and Number Errors in a PNNL Learners' Corpus", is based on group work. It runs for 10 days and the result weighs 20% in each student's final evaluation. In terms of instructional design, this activity was implemented in Moodle LMS platform using two activity typologies: Wiki and Forum. Each 5-member group is defined by the teaching staff based on information provided by trainees in the recruitment stage and during previous course activities. Heterogeneity is the desired profile for each of the resulting 5 groups. Students sharing geographical origins or residential area, with similar academic and professional backgrounds, or who speak the same languages are placed, whenever possible, in different groups, as to foster the exchange of complementary viewpoints within each group, and to enhance the need for discussion and interaction.

The activity consists in the analysis of a corpus of 46 texts written by adult learners of Portuguese, attending formal A1 to C1 level language courses at Coimbra University, and who are speakers of four different native languages. Each group member is assigned a subcorpus of 8 to 10 texts and is requested to identify all cases of non-target (i) noun gender assignment and agreement, and (ii) noun number agreement. All errors detected by each student are then to be placed in their proper cell on the group grid, and finally counted. The grid is gradually filled in with the contribution of each group member, and therefore all members individually cooperate in attaining the common goal, which is the correct identification of at least 60 non-target occurrences. Besides the wiki grid, each group is also provided with a closed forum, where all communication related to this activity should take place. Students are asked to collaborate through the group forum, by sharing difficulties and requesting assistance from peers. Interactions are monitored by course instructors who, whenever necessary, also provide feedback, especially when certain questions are left unanswered by peers or when discussions are skewed by misconceptions. Active group forums, often leading to the reconsideration of original responses and the collective correction of the group's grid, can add a collaborative tier to the activity.

METHODOLOGY

For the analysis of the forum discussion data, a typology of qualitative analysis categories was created. All posts published in each of the 5 group forums were analyzed using this typology. Given the fact that several posts could easily fit into more than one category, a qualitative analysis software (MAXQDA 12) was also used to help map the frequency and distribution of entries into each category[7]. The number of posts each student and each group published was also taken into account in order to establish if the frequency of posts weighs in the learning process. An indirect observation of each group's wiki was also carried out, comparing each of the final filled in grids with the target responses. As such, students' final evaluations for this activity were also considered, as they provide insight as to whether participating in the forums weighs on students' performances and on the results obtained.

Thus said, this study combines qualitative and quantitative data analyses, through direct and indirect observation.

PRESENTATION AND DISCUSSION OF RESULTS

The results intersect data obtained through forum content analysis and the performance of each group on the wiki grids. First, the activity of each group will be described, followed by a general analysis of the collaborative work in the learning community. Since all groups completed the wiki, group analysis will focus on the forum

[7] In order to guarantee the learners' anonymity, each was assigned an alphanumeric code.

activity. To this effect, 5 categories were considered: argumentation, agreement, technical issues (questions and answers); pedagogical issues (questions and answers); mutual help (questions and answers).

Group 1 - Of the 21 forum entries by group 1, all fall under the pedagogical scope, as students did not present any technical difficulties. 4 of the posts were published by the teacher in order to address students' questions that was left unanswered by their peers, or to clarify relevant issues.14 mutual help questions were published, although only 3 were answered directly by peers. It is noteworthy to highlight that 3 students posted to express agreement with peer statements, while 14 forum entries acknowledge the help granted.16 entries provide arguments supporting or questioning choices made in corpus analysis, 4 of which published by the teacher, and the remaining 12 are arguments pertaining to possible answers to pedagogical questions raised by the students themselves.

Group 2 - Of the 5 students of the group, only 2 participated on the forum. A total of 6 entries were accounted for. The teacher participated three times in this forum, once in response to a pedagogical question (resorting to an argument) and, twice as response to a technical issue. 3 mutual help requests among learners occurred, but none of them were answered by peers. Considering that there were no answers to the mutual help requests and given the inexistence of acknowledgement messages, it is safe to infer that this group did not act collaboratively in completing the assignment.

Group 3 - Only 2 learners participated in the forum. In a total of 7, 3 entries were posted by the teacher. While clarifying 2 doubts presented by students, the instructor, in two separate posts, agreed with their hypotheses. Of the 4 questions posed by the 2 participating students, 3 were pedagogical, 1 was technically oriented. 1 entry corresponds to a mutual help request left unanswered by peers and finally addressed by the teacher. Bearing these data in mind, it is again safe to conclude that, within this group, no collaborative work among peers was established.

Group 4 - In group 4, only 2 learners participated on the forum. The students' 8 posts were merely informative and/or argumentative regarding the choices made while filling in the wiki's grid. Only one interaction occurred between one student and the teacher, and none among the students.

Group 5 - In this group, only one learner did not participate of the forum. In a total of 18 forum entries, 12 participations were of a pedagogical nature, 1 regarded a technical issue, and the remaining can be divided into arguments and acknowledgments. The professor published 3 posts. Although with a noticeable numerical difference between mutual help questions (10) and answers (4), collaboration among students took place. Most posts are argumentative, presenting justifications of choices. Only 1 technical issue was raised, which was answered by the instructor. 1 learner reported technical difficulties, but clarified that these had been solved by the UC_D support team, via private message.

General Groups analysis

A global analysis of the work carried out by the 5 groups highlights that most interactions consist in arguments justifying choices the learners made while filling in the wiki grid, or justifying suggested corrections.

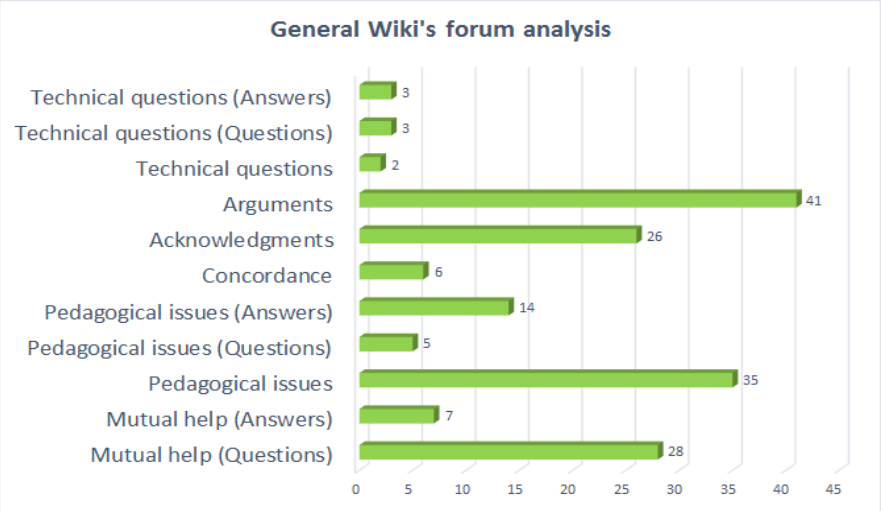

Figure 1: General wiki's forum analysis

The vast majority of the forum entries are pedagogically related, suggesting that the forum was an adequate choice for this activity. Students used this communication tool to ask questions and to discuss the application of concepts to the empirical task at hand, having also asked for help on technical issues (8). Of the 35 pedagogical interactions, 5 are direct questions/requests regarding the content of the activity. 28 out of the 35 pedagogical interactions ended with a request for mutual help. However, even taking into account that in only one answer entry up to 3 different questions were answered, this number it still not what could be expected, from a collaborative point of view. Furthermore, considering the mutual help requests (28), only 25% were answered. The questions regarding pedagogical issues (5) obtain the triple amount of answers (14), but these include answers by the professor and peers to the same questions.

Now considering the intersection of the forum analysis with the final evaluations of the students in this activity, the following aspects are worth highlighting:

- Group 1 displayed the highest number of entries per student. All members participated on the forum. Engagement and mutual help was positively reflected in individual evaluations, since all students obtained the maximum score (20/20).
- One of the groups with the fewest posts was Group 2 - with a total of 6 entries - most of which presenting arguments regarding options while filling in the wiki grid. Though confirmation requests were produced, there were no answers from peers, suggesting some engagement, but low interactivity and collaboration. This group obtained the poorest results in the activity ($\bar{x}$19,12).
- Group 3 also presented very few forum publications (7), most of which were posted by the teacher. As such, most interactions occurred between the students and the instructor. The lack of peer interaction and collaboration can be related to the fact that group 3 obtained some of the weakest results in the activity ($\bar{x}$19,36).
- Group 4 was the third group with the lowest number of participants in the forum. No mutual help requests or pedagogical questions were presented. The 6 entries produced were only to inform colleagues of the choices made when filling in the wiki. There was no peer interaction. The evaluations of this group are $\bar{x}$19.52.
- Group 5 was the second best group regarding forum publications (18), displaying a good level of interactivity. Only one learner choose not participate in the forum. Mutual help requests, and also several argumentative and acknowledgement posts were observed. Regarding the final results for this activity, group 5 was the second best of the class ($\bar{x}$19, 68).

CONCLUSIONS AND FUTURE WORK

The analysis carried out in this study highlights a link between the degree of group interactions and the level of individual results in the activity. Although, transversally, the results in the activity were positive, a greater level of interaction between group members corresponds to a better performance, both by the group and by individuals. This aspect is corroborated by studies in this field [2], that found that students who voluntarily engage in online discussion forums achieve better examination results than those who do not. Although the examination results were only marginally superior, the results suggest benefits if students do in fact engage.

In the present study, it is also possible to consider the effects of cooperative and collaborative work. As was reported above, certain groups acted collaboratively, exploring the available tools to communicate, sharing and discussing the construction of the final product. However, other groups engaged very little, having addressed the resolution of the activity as a simple sum of individual efforts, in a more cooperative, rather than collaborative attitude. Our data reveal that, in this case, the cooperative approach was not a poor strategy, since all groups filled the wiki's grid successfully. This result is similar to the findings by Hathorn [4], suggesting that small online graduate groups prefer cooperation over collaboration. Putting students in groups does not automatically result in collaborative interactions, hence, providing guidelines for groups can increase the likelihood of collaboration.

As future work in this field, a sequence of analyses of the many collaborative activities designed for the LTPNNL course is being carried out, for different editions the course, with the purpose of verifying if and how collaboration can increase engagement, high order thinking and subsequent knowledge creation and sharing throughout the course's lifecycle.

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The paper has been reviewed.