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*The Call Triangle: student, teacher and institution*

## Designing for online interaction: Scaffolded and collaborative interventions in a graduate-level blended course

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### Abstract

This article examines types of interaction from the perspective of intervening agents and interaction outcomes. We argue that the strategic combination of these types of interaction with certain core features (such as dosified input, attainable goal-setting, personalization and collaboration) contribute to creating a more effective relationship between instructional design, use and the interactional purposes of learning activities. The paper also offers instructors and course designers various considerations regarding the pedagogical nature of learning activities and the actions that both learners and instructors can carry out to optimize the online educational experience. Consideration for emergent trends in research on related areas are also presented.

*Keywords:* online interaction; instructional design; course design; e-learning; scaffolding

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### 1. Introduction

In the context of online education, constructs such as instructional design, implementation of learning activities, scaffolding, assessment, resource selection and interaction among agents are seen as essential attributes of online courses and/or modules (Cuesta, 2010a). In educational scenarios, the interrelation of all these components has a direct impact on the learning performance of the students (Wagner, 1997), who benefit not only from sequential planning and strategic action but also from generative practices that foster communication, socialization and mutual knowledge exchange.

Interaction, as a leading component of instructional design, can be examined from multiple perspectives. Various existing typologies (Moore, 1989; Wagner, 1997, Sutton, 2001; Hewitt, 2003) refer to certain agents and different types of interaction (for example, from learner to instructor, from learner to learner, from learner to content, or from learner to course interface; Moore, 1989; Roblyer & Ekhaml, 2000). An analysis and implementation of these interactional modes should provide students with opportunities to customize their learning experiences according to their needs, styles, skills, demographics, and previous learning history with online formats and beliefs (Northrup, 2002; Palloff & Pratt, 1999; Wojciechowski & Palmer, 2005) and, consequently, should favour satisfaction, participation, communication, exploration, and self-regulation processes (Wagner, 1997; Cuesta, 2010b; Anderson, Rourke, Garrison & Archer, 2001).

Numerous discussions referring to the expected quality of online interaction have taken place, and different values have been assigned to the intervening factors—namely interaction agents, outcomes and/or instructional delivery. This has much depended on the lens with which such situation has been examined. One trend has favoured a conception of interaction as the dependable success factor of student learning outcomes (Balaji & Chakrabarti, 2010; another (rather less optimistic) trend revealing less

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satisfaction with the simple belief that the use of interactive technology leads to enhanced learning has focused on the analysis of positive and negative impacts of interaction (Beaudoin, 2002; Godwin, Thorpe, & Richardson, 2008).

Following So's proposal (2010), and finding the balance, benefits and implications among the two aforementioned trends, this paper aims to transcend the study and comparison of types or amounts of interaction to instead examine relevant criteria in the design and implementation of online interaction in academic settings. It examines types of interaction from an instructional perspective that targets learning agents and outcomes (Wagner, 1997), that, when strategically combined, enhance successful online interaction practices. It also discusses learning outcomes that "help to specify instructional means to achieve a certain goal of interaction" (Wagner, 1994, p. 258), while making reference to learning activities designed according to specific learner competences, content, task and Web 2.0 technology tools (Table 1).

## 2. Types of interaction

This section presents the interaction attributes observed in an online course in relation to the agents, the outcomes and the way these interactions were fostered by means of e-learning activities and the inclusion of Web 2.0 tools. Concepts taken from online learning theory make it clear that engagement in online interactions contributes to personal and collective learning (Wilson & Stacey, 2003). The fact that learners are required to participate and negotiate in meaningful interactions fosters their interpretation and construction of meaning and enables them to construct their own expectations towards communication within a small group (White, 2007).

In a brief review of recent research related to the instructional and social interactions that take place in online learning environments, So (2010) emphasized two main types of interaction: one related to learning agents as defined by Moore (1989), Anderson and Garrison (1998) and other referred to learning outcomes (Wagner, 1997). In interactions related to learning agents, human and non-human agents interact in various ways: (a) student-student; (b) student-teacher; (c) student-content, (d) teacher-teacher; (e) teacher-content; (f) content-content (Anderson, 2003). In addition to these six types of interaction, Northrup (2002) has described the student- feedback interaction as originating "in the need to close the communication loop on areas of instructional content, but also on general social communications" (p. 127). This categorization, which provides information related to the participants of a communicative transaction, is in essential accord with the tenets of social constructivist theory (Vygotsky, 1978) that state learning takes place by means of social interaction with the environment, including human beings and other entities.

The learning outcomes type of interaction (Wagner, 1997) shifts the focus from learning agents to the specification of instructional means to achieve a certain goal of interaction (So, 2010). According to Wagner, the emphasis on the outcome of an interaction serves to observe the effects that interactions have on learners when they are required to adapt their own learning experiences to meet particular needs or personal characteristics or when they are able to transfer newly acquired knowledge to the requirements of a particular learning situation. In other words, online interactions focused on outcomes of instruction should offer learners the possibility to access, analyse and transfer information—vital abilities needed to face the challenges imposed by today's digital world.

A third type of interaction, collaboration, is identified by Donato (2004) as being "about carrying out meaningful and purposeful joint work that embodies changing social networks and relations" (p. 285). In his view, the result of collaboration is reflected in the construction of new knowledge and growth for the group. In this light, the affiliation of *affinity groups* can be observed when students become members of an online class, a Google Group™ or a community of learning associated with a given semiotic domain (Gee, 2003) that can enable individuals to build trust and pursue common goals, to take part of tacit to explicit knowledge-raising activities, and to seek further connections inside and outside the group.

An additional consideration concerning members of such a group is that each individual is unique but also a derivative of the social group (Petrovsky, 1985) because "socially constructed activity mediates all interpersonal relations and is at the core of the collective" (p. 286). In short, the advent of collaboration can be determined by the emergence of new knowledge, the adoption of proactive and differentiate attitudes and reactions in reference to a learning situation, the social and personal significance that each participant assigns to it and the continuous involvement in collaborative activities that may lead to the growth of a group (Donato, 2004, p. 284).

Facilitating these types of interaction can lead to the construction of a learner-centered environment in which individuals can share their particular knowledge, beliefs, and attitudes and can link learning to their own experiences (Swan, 2005). This learning environment should also foster effective and consistent interaction that promotes genuine learning and prompts participants to consider themselves as members of

a community of learning (So, 2010; Wilson & Stacey, 2003; Garrison, 1998) whose social norms foster the participation of all learners and encourage collaboration, the negotiation of meaning and the collective construction of new knowledge.

### 3. Context

This pedagogical reflection was derived from experiences in teaching a graduate-level course for a Master's in English Teaching at the Universidad de La Sabana, Colombia titled "Setting Up and Optimizing Language Resource Centres", examined throughout four different academic terms with different cohorts of adult students (aged 25-35).

### 4. Fostering interaction through learning activities

In consideration of the conceptual definition of learning activities proposed by the European Commission and EuroStat (2006) as "any activities organized with the intention to improve an individual's knowledge, skills and competence" (p. 9) and the delivery mode and purpose under which learning activities are examined in this study, we recommend teachers-designers to bear in mind a number of core features that could effectively aid the relationship between the design, use and the interactional purposes of learning activities. These are *dosified input*, *attainable goal-setting*, *personalization* and *collaboration*.

#### 4.1 Dosified input

Drawing on the principles of cognitive load theory (Clark, Nguyen, & Sweller, 2005), we took three factors into consideration for the instructional design of the course: (a) the learners' level of expertise, (b) the complexity of the content, and (c) the instructional materials. The course was composed of 4 modules on the design of a virtual language resource centre to provide practice and learning opportunities related to a particular language skill or system to a group of learners.

With this in mind, during the analysis phase (prior to the design and development of materials), we evaluated student profiles to determine whether the target students had any prior knowledge regarding virtual language resource centres. Results indicated that 40% had no prior knowledge, 20% had some intermediate knowledge, and 40% had expertise in the subject matter.

Subsequently, we created a competences matrix that guided us in the design and development of every module. This matrix included, per module: the competence to be developed, the contents, the type of assignment, the core module activity/product, and the Web 2.0 tool(s) to be used. Choices of technological applications were made with a clear pedagogical rationale in mind, so as to trace the individual progress of each student and plan their acquisition of competences acquisition.

The course utilized both synchronous and asynchronous sessions (both online and F2F) and various actions have been taken to assist learners in the management and pacing of the course, aiming to find a balanced cognitive load for the learner. In the design and development of the E-tivities<sup>1</sup>, the designers paid special attention to the selection and sequencing of content, as well as to the complexity of that content. The E-tivities were designed to provide learners with access to various sources of information, particularly webcasts, podcasts, discussion boards, electronic journal publications and videos. Learners were then prompted to share and discuss their arguments concerning the tasks by participating in online forums and extrapolating those findings to their teaching situations. Once more, instructors observed that the inclusion of media technology offers learners not only a variety of interaction opportunities with diverse agents, but also the possibility to manage and control their learning experiences through their personal selection and adaptation of resources to meet their target learning objectives and needs.

The materials used in this course (currently in its fourth edition) have been revised and edited prior to implementation each semester. Throughout its development, activities and/or strategies that have not proved effective have been adapted or sometimes discarded. Such revisions have been generally conducted during team teaching meetings and instructor (s) allotted planning time.

In designing and developing a course, instructors should focus primarily on appropriate adaptation of the aforementioned factors in the design and development of a course. For example, in this pedagogical experience, the selection of the course competences was developed and adapted based on the complexity of the content and experience of the learners. The design team designed each learning activity with various sections that indicated how the activity should be developed, the required tasks to be performed

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<sup>1</sup>E-tivities refer to course online activities. The original term was coined in Salmon (2002).

before the development of the core module activity, and the suggested learning resources, specifically targeting students who needed to explore further learning connections by using the allotted resources (Table 1).

Table 1. Course Matrix.

Setting and Optimizing Language Resource Center Course Matrix				
Course General Competence		Design a virtual language resource centre to provide practice and learning opportunities related to a particular language skill or system to a group of learners by means of collaboration- based activity to foster learning autonomy		
Modules	Specific Competences	Content	Type of Assignment	Web 2.0 tool
Virtual Language resources centres (VLRCs)	Analyse the developments of various VLRC related to the promotion and improvement of the foreign language according to a given educational context.	Conceptualizes and characterizes VLRCs within a context	Exploration and analysis of VLRCs samples	Prezi™ Calameo™ Google docs™ Forum
			Forum discussion	
		Self-access and self-directed learning	Video Observation: Comments and critiques to the points presented	
			Collaborative rationale writing	
Setting up a VLRC	Design a VLRC that provides varied learning resources, scaffolding and collaboration and community building tools.	The architecture of a LRC	Online discussion	Xtimeline™ Screentoaster™ Voki™ Wallwisher™ Sbox™ Mindmeister™ Zoho™ Primary Pad™
		Learning opportunities at a VLRC core principles for designing virtual learning environments	Article reading + forum discussion	
		Learning objects that suit the mission and objectives of the LR	Learning object design	
Research Opportunities in the VLRC	Present an analytical view of the VLRC social outreach. Explore different mechanisms to evaluate the effectiveness of a VLRC	E-learning for all	Pre-session student work	Skype™ Moodle™ Glogster™
		Evaluates the use of Web 2.0 tools as part of a VLRC	Online discussion	
		Creates evaluation instruments for the VLRC	Checklists/surveys	
LRC Experiences	Give account of the experiences acquired throughout this course	Disseminates the learning products of the VLRC	Conversation with an expert	Skype™
			Publication of the online newsletter	Calameo™
			Creating an e-bulletin board	Calameo™

Note: Students hosted their VLRCs by using free access content management systems like Wix™, Wordpress™, Wix™, Webs™, Moodle™. To view VLRC examples, please access <http://rochi-vc.blogspot.com/p/how-to-compost.html>, <http://alejaroa80.wordpress.com/>

#### 4.2 Scaffolding

Consultation sessions delivered via Skype™ via Adobe Connect™ and/or face-to-face were also important components in the gradual scaffolding of students. *Scaffolding* was understood metaphorically as a structure relying on the principle that teachers can temporarily assist students by smoothing the progress of their development. While learners perform the tasks according to their ability, the teacher makes a gradual intervention; as the learners' mastery increases, the instructor reduces the scaffolding provided and strives to achieve the goal of making learners capable of handling their autonomy, independence and process pathway (Wood, Bruner & Ross, 1976).

Following Graesser et al. (2000) and Reiser (2002), scaffolding is also seen as a primary strategy to support interaction and learning processes that includes the tools, strategies, and guides used by human and computer tutors, teachers, and animated pedagogical agents during learning. Scaffolding, in this study, was also conceived as "a form of assistance provided to a learner by a more capable teacher or peer that helps the learners perform a task that would normally not be possible to accomplish by working independently" (McLoughlin & Marshall, 2000, para.4). In this sense, systematic and scaffolded interaction leads tutors and students to: (a) participate in higher-order thinking academic discussions, which can occur in asynchronous (for example, wikis and forums) or synchronous modes (for example, online chat and Web conferencing); (b) design learning materials to foster collaborative and self-regulated learning so that trainers and trainees can take advantage of their new adaptation or adjustment to these modes to construct knowledge; and (c) reflect continuously on their roles as participants in a particular teaching-learning community (Alvarez & Cuesta, 2011).

#### 4.3 Attainable goal-setting

Performance-based objectives were included for each lesson with the principal objective of motivating students towards attainable goals and academic actions. These performance-based objectives were also accompanied by the explicit reference of an estimate of task completion time for each activity. Following the principles of self-efficacy, the provision of specific goals for each lesson and activity was considered to act as a motivator for task performance (Wood & Bandura, 1989). In addition, tutors took into account their prior experience in teaching other online courses, which proved effective and used several strategies that could aid an attainable goal-setting mindset (Cuesta, 2010b). Among the strategies that instructors implemented, were: (a) establishment of activity deadlines (generally posted at night to avoid conflict with work and daily personal activities), (b) selection of a constant amount of reading and study materials, (c) use of different formats to present information, and (d) open-mindedness to changing the syllabus and responding to students' needs upon specific requests.

#### 4.4 Personalization

The personalization factors designed for and implemented in the course were rooted in Keller's ARCS Motivational Model (1987a) with its four dimensions: attention, relevance, confidence, and satisfaction (Keller, 1987b). Field studies have proven the validity and reliability of this model in terms of learner motivation, computer mediated communication and e-learning design (Keller & Suzuki, 2004). This a problem-solving approach used to design varied motivation strategies—applicable in any learning environment—to arouse and sustain students' motivation to learn when using and learning from instructional materials (Keller, 1987, 1999).

Additionally, it was considered that all the learning activities students would develop in the course could be of further application in their own teaching/learning contexts. During interaction in the LMS, tutors prompted participants to reflect on the materials from both a student's and a teacher's perspective. To build student confidence, tutors maintained a friendly but assertive tone, focused on building rapport in the community of participants. This approach underscored communication rules that targeted individual and group feedback interventions, in which students could evaluate their and their peers' performances and critically and constructively. A survey conducted at the end of the semester indicated that learners shared a sense of contentment and reported having been instilled with feelings of achievement and triumph, which helped them to accomplish their goals and surpass the academic difficulties they encountered in the course.

#### 4.5 Collaboration

During the course, trainers carefully considered the attitudes of each student towards the different learning activities, as well as the social and personal significance that each participant assigns to the activities (Donato, 2004). Generally, this was done through careful observation of student actions and comments made principally in the forums and group chats. Tutors prompted discourse-making and negotiation of meaning in the course activities while learners self- and peer-assessed their learning

outcomes. Moreover, it was of utmost importance to identify and learn about the students' profiles and examine the expansion of collaborative activities beyond the classroom. Tutors found that academic activities were not conducted exclusively in the online classroom but were also extended to students' workplaces.

Another strategy used to prompt a *collaborative interaction* relates to the dissemination of information among faculty and diverse educational communities. As students realized their products were consulted and read by other peers and different instructors, they increased their pride, their product quality and sense of contentment. Considering advances in facilities for Web-based publishing, it is now relatively easy for instructors to make student products accessible through numerous channels, including online newsletters, institutional Webpages, blogs and e-bulletin boards. These materials can be used with faculty teaching/modelling course materials purposes and could also be a pathway to further connections new research projects and student publications in academic journals. Graduates should be encouraged to take part in academic communities at national and international levels so that they feel they are part of a developing community that collaborates and makes classroom practices transcend into lifelong learning opportunities.

## 5. Conclusion

In this paper, the authors have carefully examined significant factors in the design and implementation of online interaction in academic settings and have also provided various strategies to successfully enhance online interaction and bridge the gap between the design and use of online learning activities, which is sometimes ignored by online instructors.

Further research and intervention should keep inquiring about the ways to foster interaction practices in academic communities and examine how learners could become involved in individual and collective online activities without a direct intervention of the instructor. In addition, the potential benefits afforded by the use of Web 2.0 tools in online learning environments, in which collaboration and knowledge sharing play a predominant role, will need further review of the social aspects of the learning. Educators cannot assume, for instance, that everyone is happy or even comfortable working with the blog or interactive forum set for a particular module or learning unit. It may be necessary to give further attention to the skills and the attitudes that are needed to effectively handle these tools and also consider that learner training in this regard is a must to make the best use of these technologies.

By the same token, future revision will need to be devoted to the rationale behind the use of Web 2.0 tools whose mesmerizing appearance may lead course designers (and hence learners) to deviate from the pedagogical objectives of their use. Gradual exposure to such tools accompanied by a sound reflection on their uses, advantages and withdrawals should be understood as key constituents of online or face-to-face instruction delivery.

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