Collaborative learning and mobile devices: An educational experience in Primary Education

Ana Iglesias Rodríguez a,*, Blanca García Riaza a, María Cruz Sánchez Gómez b

a School of Education and Tourism, University of Salamanca, Spain, Madrigal de las Altas Torres, 3, 05003 Ávila, Spain
b Faculty of Education, University of Salamanca, Spain, Paseo de Canalejas, 169, 37008 Salamanca, Spain

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A B S T R A C T
In this paper we review the relevance of the models of Collaborative Learning (CL) in Primary Education, also exploring the integration of Information and Communication Technology (ICT) in these processes. Through the case study method, the main objective of this article is to describe the design, implementation and evaluation of a collaborative experience with ICT involving students in the 5th year of Primary Education in a Spanish school. Information has been collected from all those involved: teachers, tutors, teacher ICT support and students from two classes participating in the investigation. The results confirm the fact that ICT provide tools and channels that have multiplied the possibilities to carry out collaborative projects, providing quality assurance to share and communicate. The experience presented provides evidence to confirm this, and at the same time, confronts the dominant methodology based more on individual learning where the teacher continues to exercise the role of sole transmitter of knowledge.

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1. Theoretical framework
1.1. Introduction

Education plays a mediating role between the student and culturally arranged knowledge. Educating is a complex task that is subject to both internal influences to the educational process (social, cultural, family contexts ...) and external ones (make up our professional heritage). For internal influences to be correctly carried out, they should take into account three relevant issues. Firstly, the objectives and curricular contents that we want to work with; secondly, the organizational context in which this educational process will be carried out; and, thirdly, the teaching strategies to be used to operationalize objectives and contents (Iglesias Rodríguez, 2010).

However, it must be remembered that education is a very complex and far-reaching process which has to be understood from a double perspective since values, customs and ways of acting are transmitted through education, and they will largely influence on the people around us. This is so because education does not occur only through words, but is present in each of the actions people perform and feelings and attitudes that everyone is capable of transmitting. The set of all these actions is what develops the individual capacities of the human being which, together with the influence of the environment on the person, give rise to learning (Rubia & Guitert, 2014).

In this regard, research and studies conducted by authors such as Vygotsky, Piaget, Freinet, Rousseau, Neill or Makarenko make clear the complexity of the learning processes that are associated with the ability of the brain to evolve, mature and develop its full potential, resulting in pedagogical models that favor these aspects in education through processes of cooperation and peer learning.

While it is true that learning is a process that the brain performs, it is also true that human beings learn in community by establishing both individual and group social relationships, communicating through the proper use of language and respecting the opinions of others. In short, we learn through dialogue, experience and research in the medium taking into account the peculiarities and contextual circumstances in which the educational action will be developed.

Therefore, a good learning entails (Iglesias Rodríguez, 2010, p. 128): (i) promote self-affirmation and positive self-concept as a
precondition to appreciate and value others; (ii) develop confidence in oneself and in others as a way of facilitating the ability to share and communicate; (iii) strengthen the group and community feeling; (iv) develop the capacity of group decision making and conflict resolution; (v) promoting learning inquirer and/or re-discovery; (vi) strengthening the capacity of analysis, synthesis and inductive; (vii) develop pro-social behaviors; (viii) increase instructional time spent working in small groups and self-directed learning; (ix) take time to direct contact with students to guide instruction; and (x) review regularly not only the content but also the methodological strategies and evaluation procedures.

Without any doubt, the techniques that accompany this general orientation encourage participation, teamwork, cooperation and interaction. From a psychosocial point of view, and based on the proposals of the School of Geneva, it could be argued that the process of teaching and learning occurs through social interaction where the exchange of information of various kinds between two or more people leads to a confrontation of different views. This fact produces complex forms of thinking that cause conflicts and promote socio-cognitive mobilization and reorganization of existing intellectual structures, generating adequate intellectual progress in the subject (Black, Torrego & Zoriquiey, 2012; Ovejero, 2013). UNESCO, in 1983, clearly defines this way of working based on a socio-affective approach:

- joint development of intuition and intellect aims to develop in students a fuller understanding of both themselves and others, by combining real experiences (as opposed to “classic” study) and analysis (p. 105).

The socio-affective method (Jares, 2002, pp. 243–269) calls into question the traditional way of learning based solely on the accumulation of information, without any personal experience whatsoever. The ideas do not penetrate the human being when they are only taught as theoretical ideas but when these are perceived by the person as an experiential learning from the accumulation of knowledge that is acquired throughout life, allowing the individual to analyze own and others’ behaviors and feelings, as well as the implicit relationships that occurs in the communication itself. Moreover, the development of empathy (feeling of concordance and correspondence with another) and analytical contrast between experience and the surrounding world play an important role in this process. Therefore, one could say that the next steps for this type of learning to happen are fundamentally three: (i) experience of a real or simulated experience, which the individual shares as part of a group; (ii) a description and analysis thereof; and (iii) generalize and extend the experience to real life situations.

Since starting positions are experiences in which everyone can participate, and all do it in a same equality status, this method is motivating for all students, thus favoring the principle of inclusion.

In the light of these premises, the general objectives set for this research can be summarized as follows: (1) Determine the impact of collaborative work in the educational development and in the learning process, detecting advantages and disadvantages and generating ideas for the future to boost an educational system in accordance with the society nowadays; (2) Promote a methodological change in the classroom in line with 2.0 education and considering collaborative work as a facilitating tool. More specifically, these objectives can be itemized as: (a) Explore possibilities of collaborative work in the educational environment; (b) Ease the integration of educational tools and resources and investigate the possible pedagogical relationships established among them; and (d) Detect advantages and disadvantages to value the scope of these new teaching strategies from an empirical perspective.

1.2. Collaborative learning

When referring to the educational model that has guided this study, the terms cooperative learning and collaborative learning have to be borne in mind. However, in the literature there is no clear consensus on the specific use of cooperative or collaborative terminology in certain contexts. Although some authors (Crook, 1998; Dalsgaard & Paulsen, 2009; Guitert & Perez-Mateo, 2013; Holliman & Scanlon, 2006; Kreijns, Kirschner, & Jochems, 2003) establish clear differences between both, the reality is that in most of the works are used interchangeably. Accordingly, the definitions of both share a common core although there are different shades:

The essential difference between these two learning processes is that the [collaborative] first students are the ones who design their structure interactions and maintain control over the various decisions that affect their learning, while in the second [cooperative], is the teacher who almost completely designs and maintains control over the structure of interactions and the results to be obtained. (Paniz, 1997; quoted in Scagnoli, 2005, p. 7, p. 7)

From this viewpoint, cooperative learning is much more influenced and structured by the teacher. According Dillenbourg et al. (1996) cooperative learning requires a division of tasks between the group members and is usually the teacher who proposes the project work, distributes tasks and roles among group members. However, in collaborative learning there is a greater level of responsibility and autonomy of students. Gros (2000) notes that in collaborative learning the group decides how to perform the task, the procedures they will carry out, the division of labor, and the negotiation between the group members, which becomes fundamental. These conditions have resulted in the project being presented.

Collaborative Learning (henceforward CL) will be thus conceived in this work as the educational approach to teaching and learning that involves groups of learners working together to solve a problem, complete a task, or create a product. As Calzadilla qualifies, (2002, p. 4) the presence of group work does not imply that it is a truly collaborative practice, it is necessary for the group to become a team, there is an added value fruit of this cooperation. Consequently, in the CL environment, the learners are challenged both socially and emotionally as they listen to different perspectives, articulating and defending their ideas. In so doing, the learners begin to create their own conceptual frameworks so they do not rely on an expert’s or a text’s framework. In a CL setting, learners have the opportunity to talk to peers, present and defend ideas, exchange and question diverse beliefs, and are actively engaged (Marjan Laal & Mozghan Laal, 2011; Srinivas, 2011).

Johnson et al. (1998) and Glinz (2005, p. 3) pointed out 5 basic components in Collaborative Learning, taking as departure point the idea that it is not simply a synonym for students working in groups. A learning activity only qualifies for a Collaborative Learning environment if the following elements are present:

- **Positive interdependence:** Members in the teams have to rely on one another to achieve the final objective. As a consequence, they are linked with others in a way that ensures that they all succeed together. If a member of the team fails to carry out his/her part, everyone suffers the derived consequences.

- **Relevant interaction:** Members help and encourage each other to learn by explaining what they understand and benefitting from shared knowledge. All tasks have to be developed interactively providing one another with feedback, challenging one another’s conclusions and reasoning.
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