Information Technology as a Way To Support Collaborative Learning: 
What In-Service Teachers Think, Know and Do

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ABSTRACT
It is often assumed that Information and Communication Technologies (ICT) encourage collaborative work by providing a set of widely accessed tools and a mutual framework for shared activities. The present study aims at determining what in-service teachers think (teachers’ opinion), know (technical knowledge) and do (tactical use) about ICT to promote collaborative learning. The authors used a questionnaire and a semi-structured interview to collect data. A mixed method approach was conducted and reliability scores calculated. Main results indicate that teachers think that ICT generally facilitate collaborative work but their ICT knowledge is moderate and their actual use limited. This leads the authors to think that this progression should be remarked in the teacher training programs to accurately depict the drawbacks of teachers’ collaborative learning mediated by ICT.

KEYWORDS
Collaborative Learning, ICT, Teacher Development, Teacher Education, Technological Resources

INTRODUCTION
In the last two decades research in learning and teaching has shown that collaboration plays a crucial role, leading to a deeper understanding of knowledge among teachers (Grossman, Wineburg & Woolworth, 2001; McLaughin & Talbert, 2006; Putman & Borko, 2000). The term collaborative learning refers to a particular method in which teachers at several levels of performance work together in small groups toward the fulfilment of a common set of objectives. Collaborative learning allows the active exchange of ideas within small groups, which leads to increased interest among the participants and promotes critical thinking. McInerney & Robert (2004) defines it as a learning method that involves ‘working in a group of two or more to achieve a common goal, while respecting each individual’s contribution to the whole’ (p.32). Most professional learning is undertaken through activities in collaboration with colleagues ‘in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms’ (Dillenbourg, 1999, p. 5). The typical collaborative learning activities include debates, case study discussions, group projects, simulations, role-playing exercises and the collaborative composition of essays and stories (Hiltz &Turoff, 2002).

Collaborative learning among teachers has its foundation in communities of practice (Lave &Wenger, 1991; Wenger, 1998) by which teachers engage in a shared enterprise over time. The key mechanism for individual and group learning comprises access to observing and then participating in the practices at the core of the community (Levine &Marcus, 2010). Scharff &Brown (2004) also report the efficacy of creating Learning Communities based on socio-cultural learning principles.
(Vygotsky, 1978), since they provide a mutually supportive framework for teachers. Collaborative learning allows teachers to progress beyond what they are able to learn alone by observing or learning from teacher education programs. Therefore Collaborative Learning is also understood from a wider perspective as a philosophy of teaching and learning more than a set of procedures within a particular method (Panitz, 1999).

Traditionally, four types of collaboration have been distinguished to take place in schools (Little, 1990): (1) storytelling and scanning, (2) aid and assistance, (3) sharing and (4) joint work. The first two are based on a collaboration relation among the participants (Monereo & Durán, 2003) and characterized by a low level of interdependency and collective autonomy (—traditional perspective) whereas the latter two are based on constructed knowledge (Scardamalia & Bereiter, 1994) and represent the highest level of collaborative work (Hernández, González & Muñoz, 2014).

Therefore, collaborative skills to be acquired need time to be interiorized (Rigelman & Ruben, 2012) as well as engaging in reflection (Wells, 2001), systematic inquiry (Ball & Forzani, 2010) and practical knowledge (Paulus, Woodside & Ziegler, 2010). But most importantly is that collaboration depends heavily on other factor: the context where it is taking place (Wenger, McDermott & Snyder, 2002). The conditions for collaborative teacher learning may differ considerably between schools that, ultimately, may lead to different types and amounts of learning activities (Bakkenes, Vermunt, & Wubbels, 2010).

**FRAMEWORK**

**Collaborative Learning Mediated by ICT**

Recently, educational research has emphasized the study of collaborative work mediated by the use of ICT. Traditionally, this line of research has been approached under the name of Computer Supported Collaborative Learning –CSCL–(Garrison, 2006; Kirschner, 2002; Oakley et al., 2004; Palloff & Pratt, 1999; Rubia, 2010)

In the last five to eight years the vast majority of collaborative processes mediated through ICT have begun to rely on the use of the so-called web 2.0. not only in the sharing of knowledge but also in its online co-construction (Little, 1990). The ultimate promise is that web 2.0. and web 3.0 tools will increase ways of collaboration in the classroom (Pérez & Delgado, 2012) because they promote students’ collaborative learning (Domínguez, Coscollola & Marquès, 2011; Pérez Mateo, Romero & Romey, 2014) and create the expectation of a change in teaching practices (Crook, 2012).

Authors (2014) define collaborative learning mediated by ICT as

*a new paradigm that relates learning theories and technological tools, based on a socio-cultural view of cognition, which propounds the essentially social nature of learning processes and is interested in technology as regards the potential it offers to create, favour or enrich interpersonal learning contexts (Authors, 2014, p. 66).*

In essence it implies a combination of technology (the relationship between the design of technology and the use of technology); affordances (affordances constrain the ways in which technologies can possibly be written or read); institutions (implementation of collaborative learning in the schools), and infrastructure (the provision of ICT as related to organizational and institutional factors) (Jones, Dirkinck-Holmfeld & Lindstrom, 2006).

**Evidence of the Benefits of Teachers’ Collaborative Learning through ICT**

Although it has been argued that there is a scarcity of baseline information about collaboration mediated through ICT and a lack of tools and measures to examine the processes involved in CSCL (Gress, Fior, Hadwin & Winne, 2010), many researchers have reported that using technology in collaborative
Using Realist Social Theory to Explain Project Outcomes
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