Abstract   Pedagogical innovation—whether involving technology or not—is shaped by a complex interaction of the innovation with contextual factors such as school and school district policy, leadership, cultural norms and values, teacher attitudes and skills, and student characteristics. This study examined school and classroom contexts in which pedagogical innovations employing technology were successfully sustained. Data were obtained from 59 cases drawn from the Second Information Technology in Education Study—Module 2, a project that examined 174 cases of innovative pedagogical practice in schools in 28 countries. An explanatory model of sustainability was derived from a qualitative analysis of the cases using grounded theory techniques. Essential conditions for the sustainability of classroom innovation were teacher and student support of the innovation, teacher perceived value of the innovation, teacher professional development, and principal approval. Contributing factors for sustainability were supportive plans and policies, funding, innovation champions, and internal and external recognition and support.

Keywords   Sustainability · Contextual factors · International studies · Technology · Pedagogical innovation

Contextual factors that sustain innovative pedagogical practice using technology: an international study

Ronald Owston

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“School is so beautiful—what a pity for us that it will end soon,” said Frederica, a 5th grade student at Scuola Bella Primary in northeastern Italy. She was talking about no longer being part of a long-standing cross-curricular technology innovation at her school. Dubbed the “Anthill” because of its extensive electronic archives of school activities, this project involves students, parents, and teachers in online discussions,

An interactive website that allows for searching of SITES-M2 case reports on various attributes such as sustainability, transferability, level of school, and evidence of supportive policies and plans is available at http://sitesm2.org.

R. Owston

Institute for Research on Learning Technologies, York University, TEL1029, 4700 Keele St, M3J 1P3 Toronto, Ontario, Canada
e-mail: rowston@edu.yorku.ca
opinion polls on local town issues, and international project linkages. At the end of grade 5 Frederica finishes primary school and moves on to another school.

Scuola Bella is one of 174 schools studied in the recent Second Information Technology in Education Study Module 2 (SITES-M2), a large scale research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA) (see Kozma, 2003 and article note). The project examined innovative pedagogical practices that use technology in schools from 28 countries across North America, South America, Europe, Australia, Asia, and Africa. One of the main goals of the project was to investigate why certain kinds of classroom-based innovations that use technology, like the one in Frederica’s school, succeed and are sustained, while others do not. This paper, in particular, reports on a sub-study aimed at developing an explanatory model for the sustainability of technology innovations.

Framework of the study

The SITES-M2 study viewed innovative pedagogical practices as embedded in a model consisting of a concentric set of three contextual levels that affect and mediate change (Kozma, 2003). First is the micro level, consisting of such factors as classroom organization and personal characteristics of the teachers and students. At the micro level, the classroom research literature (Means & Olson, 1995; Sandholtz, Ringstaff, & Dwyer, 1997; Means, Penuel, & Padilla, 2001; Schofield & Davidson, 2002) documents a strong association between technology-based practices and changes in curriculum and pedagogy. For example in many countries, the use of educational technology is part of an instructional shift toward constructivist approaches to teaching and learning within a context of school improvement or reform (Pergrum & Anderson, 1999). Instead of focusing solely on increasing the acquisition of facts related to specific subject areas, teams of students are engaged in solving complex, authentic problems that cross disciplinary boundaries. Instead of dispensing knowledge, teachers set up projects, arrange for access to appropriate resources, and create the organizational structure and support that can help students succeed. This approach moves conceptions of learning beyond rote memorization of facts and procedures to learning as a process of knowledge creation. It moves school beyond the notion of place where knowledge is imparted, to one of classrooms, organizations, and societies as knowledge building communities (Bereiter, 2002; Scardamalia & Bereiter, 1994; Brown & Campione, 1994).

Subsuming the micro level is the meso level, which includes the school organization and personal characteristics of administrators and community leaders. At the meso-level, it is well known (Fullan, 2001; Van Den Akker, Keursten, & Plomp, 1992) that innovation benefits from leadership and a supportive organizational environment. Hence, innovative practices are likely to be part of an environment in which the school management is in favor of the practice and the practice is supported by the school organization, fits in the curriculum, and is part of the teacher’s routine. In some countries, technology may be introduced as part of school improvement or reform—“a systematic, sustained effort aimed at change in learning conditions and other related internal conditions in one or more schools” (Van Velzen, Miles, Eckholm, Hameyer, & Robin, 1985, p. 48). These efforts often involve coordinated