

DOCTORAL THESIS

Insights into the social ecology of information and communication technology (ICT) implementation in schools: a quantitative approach

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**Insights into the Social Ecology of Information and Communication
Technology (ICT) Implementation in Schools: A Quantitative Approach**

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ABSTRACT

The purpose of the present study is to develop models to deepen our understanding of how ICT acts as a lever to bring about changes in student learning. Informed mainly by research in three major domains, namely the constructivist views of learning, organisational approach to educational change, and the perspective of looking at ICT use in an organisational context, ICT implementation is framed in an activity system characterised by the interplay between the ICT implementation strategies, pedagogical intervention, and organisational intervention in achieving changes in student learning.

With the questionnaire survey data collected from over 1000 teachers in 130 schools located in various districts of Hong Kong, the present study used structural equation modelling (SEM) techniques to construct a theoretical model depicting the social ecology of ICT implementation by mapping the relationships among ICT implementation strategies, the pedagogical and organisational factors, and changes in student learning. The study was successful in demonstrating that the collegial capacity of ICT implementation strategies mediated the effect of organisational interventions on changes in classroom practices. Specifically, the collegial capacity of school's ICT implementation strategies affected directly the perceived changes in learning from a teacher-centred approach to a student-centred approach, and indirectly through pedagogical intervention. To deepen our understanding on the SEM model developed, hierarchical linear modelling (HLM) was used to construct a 2-level model to examine the multilevel effects on changes in learning (the outcome variable). Results of the multilevel analysis showed that the regression results obtained from each individual school (in the level-1 model) were consistent with those in the SEM analysis. In addition, the multilevel analysis showed that 14% of the total variation found in changes in student learning was at the school level, which was largely attributable to school-level variables of socio-cultural in nature rather than to the structural characteristics of schools.

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