Cloud Computing and K-12 School IT Infrastructure in Western Canada: From Challenges to Opportunities

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***Abstract*— This paper is based on the findings of an exhaustive study of all 75 large K-12 districts in Canada's three western-most provinces: British Columbia, Alberta, and Saskatchewan. This study encompassed over 1.1 million students and a geographical area of 2,258,483 square kilometers. Facilitating teaching and learning activities for so many students across such a large territory, with diverse provincial regulations, is an impressive feat achieved by the information technology leaders of the K-12 school districts. Multiple case study analysis, followed by correlation analysis, were used to explore the nature of IT infrastructure and cloud computing use in Western Canada. A data transformation model mixed methods triangulation design methodology was used. This paper discusses the strategies used in Western Canada to deliver educational technology resources through to students, teachers, parents, and district staff. The findings of this study are that cloud computing is the primary IT infrastructure in Western Canadian K-12 education. All school districts in the three provinces studied use cloud computing for some aspects of their infrastructure. In instances where cloud computing infrastructure is not used, school-level LAN and server infrastructure is used. In addition to being an alternative to cloud computing, the rare instances of school-level server use are either to supplement or complement a district's centralized cloud computing infrastructure, with cloud computing infrastructure existing in parallel.**

***Index Terms*— IT, cloud computing, K-12, infrastructure, network, educational technology**

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