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AN ANALYSIS OF ICT POLICIES IN CANADA AND AUSTRALIA SECONDARY EDUCATION

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Abstract

This paper discusses various similarities and differences in ICT curricula and policies between Canadian and Australian secondary education. While people see these two countries as having very similar cultural, social and educational backgrounds, the analysis of ICT curriculum shows major differences. After analysing the content and policies, it is believed that the Canadian ICT curriculum shows more programmatic approach to move computer science towards the next level: (a) tertiary education instruction and (b) mastering programming. Differently, Australian curriculum perceive ICT mostly from a learner sing technology, as a way of acquiring knowledge through the use of technology and less as a way of promoting programming and designing software. However, new trends show the Australian curriculum as being updated and important voices calling for more hours of programming in schools.

Introduction

In the beginning of the 21st Century, the impact of introducing information and communication technology (ICT) in society has been perceived by national and provincial governments as important paths of accelerating knowledge and economic growth (Australian Council for Computers in Education [AACE], 2011; Technology Education Network, 2010; U.S. Department of Education, 2010). As such, ICT education became an important focus, as a way of speeding up the process of fostering ICT related knowledge and assure that future specialists are capable of continuing and improving the knowledge required in the advancement of technology (Anderson, 2008; Kozma, 2011). All world countries started important campaign of implementing ICT education in their national educational systems.

In particular, Canada and Australia have a great success in introducing ICT in all areas of society (UIS, 2009; Luu, & Freeman, 2011). Both countries are considered developed countries, have a common history as being part of Commonwealth, and have similar educational systems. These countries have large areas containing very diverse populations, from aboriginal or immigration roots. They have advanced technological level and a very sustainable internet infrastructure (Schrum et al., 2015). The education is decentralized in both countries, as in Canada the provinces have the main responsibility of organizing the educational settings at all levels, while in Australia the states have similar reaching rights of organizing education similar to Canadian provinces. As well, both countries have experience in using standardized testing. For more than a decade, in both countries the ICT and Internet

connectivity is almost universal. This paper will consider mostly ICT aspects from the New South Wales state from Australia and from Ontario province from Canada. This research has two main goals. First goal is to analyse the content of the ICT curricula in both countries and to show curricular similarities and differences between these two educational systems. Second goal, is to understand policies and the way ICT curricula is structured for the teachers and students.

Literature Review and Methods

ICT affects the way knowledge and power influence all aspects of society and, in their turns, each societal aspect are influences ICT education in multifaceted ways (Stoilescu, 2005, 2009; Technology Education Network, 2010). Being a global phenomenon yet developed by various countries with different cultural and social views, the ICT education has being implemented in diverse ways and perspectives (Kozma, 2011). More than a decade ago, in Canada and Australia, access to ICT devices and Internet connectivity became ubiquitous at schools (OECD, 2005). However, even the basic notions and key terms in ICT curricula are different in every country. This situation is true even though there are so many similarities between these two countries.

For instance, it was noticed that the terms used in computer related curricula are different in Canada and Australia. For instance, in Australia, ICT curriculum is introduced from year 7 to year 10 as Information and Software Technology (IST) and in the least two years in introduces Software Design and Development (SDD) and Information Processing and Technology (IPT) for years 11 and 12. As well, a more hands-on unit is introduced for Graphics Technology. As well, there are some areas of computer instruction in Technological and Applied Studies (TAS) curricula.

In Canada, in the Ontario province, there are called four ICT related courses that emphasize programming: Introduction to Computer Studies in grade 10, Introduction to Computer Programming for Grade 11, and Computer Science or Computer Programming for the Grade 12. As well, there are several areas of ICT related curriculum in Educational Technology from Grade 9 to Grade 12 that emphasize different aspects of computer technology distinct from programming. Some course are: Communications Technology Broadcast and Print Production; Communications Technology, Communications Technology: Digital Imagery and Web Design; Computer Engineering Technology; Computer Technology; Computer Engineering Technology; Engineering Technology.

We attempt to present a framework capable to provide an efficient way to analyse ICT curricula in comparative education. For instance, comparative education was developed many decades ago as it "demands appreciation of the intangible, impalpable, spiritual and cultural forces which underline an educational system; the forces and factors outside the school matter even more than what goes on inside it" (Kandel, 1933, p. xix). As this research is an intersection of ICT education and comparative education, we use various reciprocal influences between social and curricular trends, in order to emphasize the way agency is

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nurtured through the ICT curricula in both countries. Qualitative research is used to produce a detailed document analysis (Bowen, 2009) of ICT policies and curricula in Australia and Canada secondary education.

Findings

In the introductory part of the ICT units, it was noticed that in the ICT curricula from both countries concepts of teaching ICT for a diverse population are introduced. For instance, Canadian curriculum explicitly gives recommendations for the case of teaching to diverse population or for people from diverse ethical and linguistically background and, as such, provides some advice for students. The Australian curriculum introduces many theoretical aspects of ICT like copyright issues, ethical issues, social issues, and industrial issues.

As well, these curricula have different emphasis between general ICT literacy and the use of programming. First of all, the Year 7-10 Australian IST curriculum has seven core topics and 8 optional topics. It can be studies as a 100 – hour unit or as a 200 hour unit. These topics are: (a) design, produce and evaluate; (b) data handling; (c) hardware; (d) issues; (e) past, current and emerging technologies; (f) people; and (g) software. Looking at these topics, it was noticed that these core topics were very theoretical and the learner often had quite a passive role.

The optional part of the IST curriculum are: (a) artificial intelligence, simulation, and modelling; (b) authoring and multimedia; (c) database design; (d) internet and website development; (e) digital media; (f) networking system; (g) robotics and automated systems; (h) software developing and programming. Except maybe the first option, these parts are usually very hands-on. However, the programming might be missed for the first seven options. Only the last option contains, as the title suggests, the possibility do coding. Some content such as internet and website development, database design or digital media might be done either as offering programming activities either as a hands-on activity without any programming. For the rest of the unit options, all programming activities can be skipped or are not offered at all. The Australian curriculum spend considerable time on the process

While the computing curriculum inevitable start with some theoretical considerations, hands-on activities are strongly emphasized very soon. The hardware and the programming are both very conducive to hands-on experiences. There is a consistent part for software development and the language is this and it is soon conducive for practical activities.

The Canadian curriculum explicitly emphasize to programming activities. As such, they call the courses as "computer studies", computer science and computer programming and computer programming. Different from the Canadian Curriculum, the Australian curriculum do not emphasize programming. As such, they leave to the teachers the opportunity of taking more or less programming. In this case, if the teachers are not programming savvy, they might chose not to do teach programming for students and as such, students can learn these classes without programming.

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As well, the Canadian ICT curriculum explicitly emphasizes the use of debugging and testing for the purpose of improving and speeding up the process of designing software. The activities of debugging and test are integrated in programming and software design. Different from that, the ICT Australian curriculum does not emphasize about the use of testing and debussing and t integrate it with programming practices.

Discussions

As initially it was expected a greater degree of similarities between the two countries, in fact it was found that the countries structured the ICT curricula quite different as parted on divergent paths. The Canadian curriculum explicitly mentioned from the beginning whether the unit preparation is intended for further preparation for college or for university and as such, it offers a substantial time for programming. It is believed that Canadian Curriculum provides a stronger emphasis on programming and advancing computer science knowledge at the next level. As expected somehow in previous studies (Tran & Stoilescu, 2016), it is believed that due to lack of qualified ICT teachers, Australian ICT curriculum promotes less acquiring programming skills and more using technology for learning purposes.

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