Post Publication Review

Review

In their analysis McLachlan, Craig and Coldwell-Nielsen (2016) gave some insight into the complex issues around implementing Information and Communication Technology (ICT) in schools and the potential flow-on impact on our future workforce for suitably trained and skilled personnel. They begin with a fascinating review of the literature to show reasons for declining interests in ICT careers, and focus on data from Victoria to demonstrate their reasoning. The use of secondary data analysis is interesting. The paper presents a thorough and informative investigation.

In their paper the authors re-presented publicly available secondary data and discussed on the one hand the decrease in enrolments in computing subject and courses (sections 4 and 8), and the negative influence on students to not enrol in ICT subjects (section 5), as well as, on the other hand, State and National government influence on Victorian schools (section 6), students being computer literate (section 7), the increasing use and availability of technology (section 9) and the generally positive attitude students had towards computers (section 10).

The authors revealed that "the widespread use of computers has not resulted in an increase in students studying computing, nor even an increase in their proficiency with computers; rather it has had the reverse effect" (p 1). This is curious because similarly studies have shown that since the Australian Computer Society made ethics teaching for ICT courses compulsory for accreditation, graduates have actually decreased in their ability to engage in professional ethics reasoning, when compared with ICT workers who have not had university training (Al-Saggaf, Burmeister, & Weckert, 2015; Lucas & Mason, 2008; Simpson, Nevile, & Burmeister, 2003).

The authors suggested, further research was needed to correct the misconceptions keeping students from studying technology and becoming trained and skilled labour in the future. In particular:

> "...stereotypical perceptions about computing, or that frequent use has provided students with an unrealistic perception of their computer abilities." and

> "... the pervasiveness and ubiquity of computing technologies may be encouraging a view that there is nothing new or engaging behind the screens that is worthy of their attention."

Although McLachlan et al. (2016) also concluded that study options and computer literacy do not necessarily improve with increasing access to computers or using computers more, the finding is not new. For example, the technology-productivity paradox was termed from data collected in 2006 (OECD, 2010) and recently not integrating technology well was thought to cause more harm than good ("GESF Agenda: Rethinking collective responsibility for public education," 2016). Subsequently, the article could have had a broader scope by considering a wider range of perception and factors critical for ICT integration. Perceptions such as those of school leaders (Vella, 2015) and among other factors, Professional Development and Training; Executive and Administrative Level Support; Stakeholder Involvement; Skill Level and Commitment of Faculty and Students; and the Availability of Resources and Financial support. (Dennison, 2013; Vella, 2014).

In other words, whilst the paper shows the student perspective, it doesn't appear to delve sufficiently into other causes, such as the role of thought leaders in schools. That is, stereotypical views of students are shown, but not the ways in which those stereotypes might be influenced or altered. Aside from thought leaders in schools, other areas to investigate is the professionalism of ICT teachers and measures they might take to improve their understanding

of the industry (Burmeister, 2015). That is, whether ICT teachers also view themselves as bound by ICT professional codes (Bowern, Burmeister, Gotterbarn, & Weckert, 2006; Burmeister, 2013), not just as teachers? If so, then they have a responsibility, as part of such professionalism, to promote their profession and have it be seen in a positive light, worthy of pursuit.

Overall the paper achieves what it sets out to do. As seen above, it leaves significant room for further research, to investigate further ways in which schools can do their part to increase student perceptions of ICT careers as being worthy pursuits for them.

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Author Response

We thank the author of the post publication review for his interesting and positive feedback and for the number of options he has suggested for future research.

The aim of the paper was to demonstrate support for the reverse effect on interest by use. The studies suggested by Vella indicate a lower capability by *tertiary* students to undertake *ethical analysis*. The authors are not clear as to the relevance of this comment in the context of *computer use* by *secondary school children*. Further, the authors are aware of a similar decrease in student interest in ICT/IT courses at the tertiary level.

We thank the reviewer for highlighting the OECD finding regarding the technology-productivity paradox and this will be taken into account in future work as will the findings in the more recent publications that he has identified and were published after the acceptance of this paper.

The authors are well aware of the wider range of perceptions and factors critical for ICT integration and we are currently supervising a PhD project which explores exactly this issue.

We agree that teachers have a responsibility to promote their profession (education or their discipline or both?) in a positive light. However, since the Australian new curriculum recommends integration of ICT teaching into all subject areas, the issue of professionalism needs to go beyond that of ICT teachers and include all teachers.

As Vella suggests, there is significant room for further research; probably two or three PhDs (if not more) can comfortably be accommodated in this topic area!

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