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A systematic narrative review of literature on Catholic schools in Australia to better understand the role of School Leadership deploying and integrating Information and Communication Technology (ICT) in this environment

Steven Francis Vella
Charles Sturt University, svella@csu.edu.au

Oliver Kisalay Burmeister
Charles Sturt University, oburmeister@csu.edu.au

Arnela Ceric
Charles Sturt University, aceric@csu.edu.au

Andrew Barnden
Boxhill Institute, a.barnden@boxhill.edu.au

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Introduction

Research literature within school education presents school leaders with a range of roles when deploying and integrating Information and Communication Technology (ICT). Roles where they were considered critically important for its success (Gurr, 2000; Hauge & Svein Olav, 2015; Moyle, 2006; Organization for Economic Cooperation and Development, 2010; Stuart, Mills, & Remus, 2009; Weng & Tang, 2014), important but not critical (Australian Institute for Teaching and School Leadership, 2011; Digital Education Advisory Group, 2013), or not necessary concentrating on other leadership roles instead (Dempster, Carter, Freakley, & Parry, 2004; Halsey, 2009; Lovett, Dempster, & Flückiger, 2014; Wildy & Dimmock, 1993). Considered together, the literature generally presents school leaders deploying and integrating ICT in schools in at least three ways. Firstly, they were critically important for success; secondly, they were needed but to a lesser extent; or, lastly not needed at all.

Within the Australian schooling system Catholic systemic primary and secondary schools have a unique place. Over 1,700 schools in 2012 were run by the Catholic Church. This sector of schools are distinct from government and independently run schools (Australian Bureau of Statistics, 2013), and from non-systemic religious and independent Catholic schools, that also operate within some dioceses (Connors & McMorrow, 2015). The Catholic school operates in the same political and social context as other schools in Australia; but, distinguish themselves from other sectors by the way they assimilate their Catholic mission to meet the needs of students, parents, Catholic community and Australian society (National Catholic Education Commission, 2015).

Subsequently, to determine if the role of school leadership deploying and integrating ICT in Catholic schools reflects the broader education environment, the research question asked for this study is: does literature on Australian Catholic schools show a similar commentary to the broader literature about school leaders and ICT? Furthermore, if the literature does show such a commentary then the sub-question follows: what does the literature say about leadership and ICT? To answer both questions, a systematic narrative literature review of recent articles on Australian Catholic school leadership was conducted. This article details the method used in the following section, then presents and discusses the findings and concludes with the implications the findings have for researchers and others.

Methodology

The methodology for this study followed that of the narrative literature review beginning with a wide search that yielded 23 articles, and then refining the results further to nine. Although the

number of articles may seem relatively small, it had been suggested that a narrative review of even five studies with a wide range of methods on a topic could draw sound conclusions because narrative literature reviews differ from empirical reviews of a large number of studies (Baumeister & Leary, 1997). Firstly, they can answer broad questions by identifying patterns and making connections across a number of studies on a topic with differing methodological approaches. Secondly, they can develop and validate conclusions and theories after the findings of individual empirical studies have been published. Thirdly, they can accept questions not being answered by the current data and can instead highlight and offer ways to address underlying problems. Fourthly, they can make different conclusions from the data, namely that the hypothesis was correct, could be correct but not proven, may or may not be correct, or is proven wrong. Finally, using a number of studies on a topic with differing methodological approaches could identify flaws, raise doubts in past conclusions and offer alternatives for any particular method.

Furthermore, although this study sits across education, ICT and leadership, the method of narrative literature review was taken from the health sciences where three types of narrative reviews exist, namely, editorial, commentary and overview. Although narrative reviews have been criticised for being vulnerable to author bias, it has also been suggested that such criticism could be addressed by using a systematic approach to establish rigorous and evidence based conclusions for both qualitative and quantitative reviews (Green, Johnson, & Adams, 2006). As such, this study applied an objective and scientific approach for selecting and reviewing the literature and included components generally expected by different guidelines for reporting studies, such as, Consolidated Standards of Reporting Trials (CONSORT), STrengthening the Reporting of OBServational studies in Epidemiology (STROBE), Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), and Standards for Reporting Diagnostic accuracy studies (STARD) ("Preparing for submission," 2016).

To locate literature specifically about Catholic schools in Australia, an advanced search criteria was entered on the Primo Search engine (Back, 2016). The search criteria, "Subject contains catholic" AND "Subject contains school" AND "Any field contains Australia" returned 23 articles. Words or phrases like 'school leadership' and 'ICT' were purposely not used in the search criteria so that a broad range of articles about Catholic schools would be returned whether their scope included leadership and ICT, or not. To only return relatively recent journal articles, the criteria, 'Publication Date' within the 'Last 5 years' with a 'Material Type' of 'Journal articles' was added. This returned articles published between 2011 and 2015. The 'Language' and 'Source' restrictions were left with the default settings, 'Written in any language' and 'Search All' respectively. Then nine

articles were discarded using the 'Peer-reviewed journals' limiter. The number of articles was then reduced to the final nine by removing those where Australia or an Australian location (such as Tasmania, Perth and Brisbane) were not located visually in the abstract.

To further answer the research question in regards to school leadership and ICT the selected journal articles were organised, managed and analysed with the NVivo software (NVivo). For the analysis, NVivo assisted coding, interrogating, and visualising the qualitative data electronically ("Using NVivo for Education," 2016). The peer-reviewed articles were initially coded using a combination of reading the abstract, the full article and searching for relevant terms such as method, results and conclusion. Table 1 presents the summary of the diverse range of studies in terms of subjects, methodologies and conclusions. For example, the subjects included a study of over 25000 year 12 physics students (Geelan, Loudon, & Wildy, 2013) along with one about eight English teachers (Jetnikoff, 2015). Also, methods included case studies, surveys, longitudinal research, focus groups, interviews, statistical analysis, day of discernment, social networking, grounded theory and document analysis. The resultant data was then used to answer broadly whether it reflected the wider literature by identifying patterns and making connections about the role of school leaders deploying and integrating ICT in Catholic schools. Additional coding was carried out after the initial analysis to understand the meanings of leadership and technology in the context of each study.

The schools studied in the reviewed literature were across multiple States. Namely, Western Australia (4), Victoria (2), Tasmania (1), Queensland (1) and one not specified. In addition, two of the four studies from Western Australia studied one Catholic school from the same long term study, one article reported only on the Catholic school whereas the other studied the Catholic school and two different faith-based schools. Statistically the studies covered 50% of the eight States and Territories of Australia. Although New South Wales, South Australia, the Australian Capital Territory and the Northern Territory have independent contexts and agendas to the States covered, these other States and Territories were out of scope because no articles from them were returned by the systematic criteria used for this review. Similar future reviews might wish to include studies from all States and Territories in their selection criteria. Subsequently, the study could represent the broader population of Australian Catholic schools but it is not clear to what degree.

Table 1: Summary of literature returned from the systematic search criteria in alphabetic order of author grouped by descending year

Author	Method Participants/ Data collection/ Analysis	Findings/Conclusion(s)
Beavis et al. (2015)	<p>5 secondary schools in Victoria. That is, 2 urban state colleges, 1 metropolitan Catholic boys' college, 1 regional Catholic boys' college and 1 co-educational Independent Melbourne School</p> <p>6 Case studies over a 3-year period using classroom observations literature in Games Studies and English curriculum</p> <p>Explored incorporating digital games into the curriculum by developing school-based units, and reflecting on the kinds of literacies and understandings fostered as students made, played or studied games compared to more traditional forms and expectations in English, Drama, Literacy and Media and ICT.</p>	<p>Various tasks promoting games (paratext) fit the English curriculum, can be used to show teachers how it fits in the curriculum, and is familiar to students.</p> <p>Understanding games through text, action and the Heuristic of Understanding Games (HUG), lessons learned with paratext were extended to games, so that gaming literacy was linked to printed and multimodal literacy to the benefit of students prone to literacy failure.</p> <p>Teachers designed flexible student-centred curriculum around games and changed their practices accordingly.</p>
Jetnikoff (2015)	<p>8 English teachers in a co-educational Secondary Catholic school.</p> <p>Case study over a 12-month period.</p> <ul style="list-style-type: none"> - Needs analysis survey for 1. digital advertisement and 2. digital 'story', - two Professional Development Workshops and - two follow-up focus groups. 	<p>School infrastructure can support effective and equitable use of ICT.</p> <p>Infrastructure not deployed and integrated well can cause difficulties and waste time.</p> <p>Teachers confident with ICT pass on their excitement to students.</p>

Author	Method Participants/ Data collection/ Analysis	Findings/Conclusion(s)
Striepe & Donoghue (2014)	<p>Members of the management team of a Catholic K-12 College in Western Australia. Namely, Principal, Dean of Curriculum, three Leaders of the Sub-schools, Bursar and Director of Mission.</p> <p>Case study using semi-structured interviews</p> <p>Grounded theory approach and illustrations.</p>	<p>Knowledge about school leadership in general has been growing over the last 20 years, but neglected faith-based schools. Large scale surveys and large number of case studies could address this. As an example, this case study portrayed how servant leadership theory was used by the school leaders in the Catholic school to combine Gospel values and distributed leadership. Such case studies and knowledge could add to existing knowledge of leadership in context including faith-based schooling.</p>
Striepe, Clarke, & Donoghue (2014)	<p>Investigate how leadership was understood and practised within faith-based schools to inform future research and leaders.</p> <p>All team members in three schools with distinct aims and environments influenced by the school's affiliation with a faith (1 Catholic, 1 Islamic school and 1 Greek Orthodox). Namely, Principal, deputy principal, assistant principal, heads of respective sub-schools, bursar, director of mission, dean of students and dean of curriculum</p> <p>Multiple case study using document analysis, non-participant observations, concept mapping and semi-structured interviews.</p> <p>Grounded theory approach from an Interpretive perspective.</p>	<p>Formal conclusions not provided, but reflections given:</p> <ul style="list-style-type: none"> - It was found that values and moral purpose had an impact on leadership that differed between participants and faith-based schools. - Understanding the influence of the school leader and collective faith, and incorporating spiritual and moral aspects, in this context have implications beyond traditional leadership frameworks. - Future case studies were suggested to better understand leadership in faith-based schools and demonstrate if and how faith-related values form the foundations of the perspectives of the faith-based school leader.

Author	Method Participants/ Data collection/ Analysis	Findings/Conclusion(s)
Geelan, Loudon, & Wildy (2013)	<p>25,682 Year 12 physics students from 99 metropolitan Perth secondary schools between 1987 to 1997 (inclusive). 54 government schools. 45 non-government (23 Catholic, 13 High Fee Non-Catholic and nine Low fee non-Catholic)</p> <p>Part of a long-term study of the construction and perpetuation of advantage in society.</p> <p>Large scale statistical analysis</p>	<p>It was concluded none of the three factors, Cohort Size, Sex and Socio-Economic Status (SES) affect Physic student results. Yet, it was reported that</p> <ul style="list-style-type: none"> - there was a correlation between SES and success in Physics. - sex was not a significant predictor of success in Physics and - class sizes around thirty did not seem a significant impediment to success in Physics. <p>Suggested further research on whether education in science helps overcome student disadvantage or not.</p>
Lavery & Hine (2013)	<p>Principals from eight Secondary Catholic schools in Perth, Western Australia, with established student leadership programs i.e. 3 coeducational, 2 boys' schools and 3 girls' schools.</p> <p>Semi-structured interviews.</p>	<p>Principals considered student leadership to be valuable for student personal growth and, and positive school culture. Principals declared servant leadership as the most appropriate model of student leadership within Catholic schools. Principals believed their role was directly and indirectly central for student leadership.</p>
Barbagallo & Boon (2012)	<p>Past Sexual and Relationships Education (SRE) students from Queensland State (48%), Catholic (40%) and Independent schools (12%). 110 post school individual volunteers aged between 18 and 21 at James Cook University and Brothers Leagues Club Townsville.</p> <p>Survey</p> <ul style="list-style-type: none"> - multiple choice and - short answer questions <p>Survey analyses executed using the Predictive Analytics SoftWare (PASW)</p>	<p>Formal conclusions not provided, but implications and future direction given:</p> <ul style="list-style-type: none"> - Use a question box during lessons. - Provide teacher training and Professional Development. - Run broad SRE subjects weekly or regularly. - Have a body that moderates SRE programs across the state and aligns programs between State, Catholic and Independent sectors.

Author	Method Participants/ Data collection/ Analysis	Findings/Conclusion(s)
Lemon (2011)	<p>Ten visual arts teachers and 959+ students (Student total at one school not reported) from ten Schools in Victoria (7 Government Primary, 1 Catholic Primary, 1 P-12 College and 1 Community school).</p> <p>In-depth focus and promotion of discussion about public art. Professional Development, one-to-one sessions and contact via NING, email and phone conversations.</p> <p>Collaboration and reflection. Reflective narrative on the professional learning in the Kaldor Primary Public Art Project.</p>	<p>Reflecting on the perceptions showed Professional Development and conversations using classroom-based technology helped explore contemporary public art and rethinking learning and teaching activities.</p>
White (2011)	<p>Pastors, principals, representatives of various Governing Bodies and senior personnel from the Catholic Education Office in the Archdiocese of Hobart.</p> <p>A Day of Discernment.</p> <p>Articulate, challenges with the evangelising mission of the Church locally through analogy of the need to continuously restore Venice.</p> <p>Reflect on Catholic schools moving into a phase of 'new evangelisation' nationally.</p> <p>Explore emerging policy initiatives and strategies associated with the identity and mission of Catholic schools.</p>	<p>Using the analogy of Venice: to sustain the richness and beauty of Catholic Education, Hobart Catholic schools require greater awareness of the contemporary world and need to commit to work (from the Day of Discernment), and innovative scaffolding (a new evangelisation) to lift 'buildings' (evangelising and catechesis) and strengthen 'foundations' (the Catholic ethos).</p>

Discussion

This section discusses findings from selected literature about Australian Catholic schools in line with the research questions. The discussion begins with the context of the studies followed by the context of leadership in schools. Next the discussion considers their role in deploying and integrating ICT and Professional Development (PD). Theoretical reasons to explain the findings are proposed and questions regarding implications for future research are raised.

The context of the sampled literature

An interesting aspect about the reviewed literature was the relatively diverse range of topics covered. On the one hand, there were those that specifically addressed curriculum, namely for English (Beavis et al., 2015; Jetnikoff, 2015), Art (Lemon, 2011), Physics (Geelan et al., 2013), and Sexuality and Relationships Education (Barbagallo & Boon, 2012), while, on the other hand, others covered school leadership, such as, Student Leadership (Lavery & Hine, 2013), the New Evangelisation (White, 2011), Servant and other Leadership (Striepe et al., 2014; Striepe & Donoghue, 2014). Considered together, the sample covered curriculum and school leadership but not specifically school leaders and ICT.

Likewise, through firstly reading the article titles, their abstract and content and secondly via a cluster analysis it was also found that the studies explored school leadership (Lavery & Hine, 2013; Striepe et al., 2014; Striepe & Donoghue, 2014; White, 2011), students (Barbagallo & Boon, 2012; Geelan et al., 2013) and teachers (Beavis et al., 2015; Jetnikoff, 2015; Lemon, 2011). Figure 1 illustrates articles with similar words clustered together, generally from the school leadership, student and teacher perspectives. Looking at the same sample in this way confirms that the studies within these schools do not specifically investigate school leadership deploying and integrating ICT.

Sources clustered by word similarity



Fig 1 NVivo Cluster diagram: Source articles clustered by similar words

Thus, the articles systematically selected for this study covered curriculum and school leadership from the perspective of school leaders, students and teachers. Subsequently, it would help those seeking knowledge about school leadership in relation to ICT amongst articles like these, to keep in mind that such information competes with, or may be within, other school-based concerns.

School leadership in context

Four, out of the nine, articles analysed covered leadership and leadership models relevant to faith-based schools. Of these, none included the perspective of school leadership deploying and integrating ICT. Instead models included servant leadership (Lavery & Hine, 2013; Striepe & Donoghue, 2014), application of the Catholic ethos in contemporary environment (White, 2011) and the spiritual and moral influence of the collective faith on school leadership (Striepe et al., 2014). Subsequently, extrapolating this finding to literature where understanding school leadership is considered contextual (Striepe & Donoghue, 2014) this sample confirms that school leadership is studied in more than one context and furthermore, that ICT could be one that is missing in this sample.

The role of leadership deploying and integrating ICT

To investigate whether ICT was an area for leadership, or not, all the source documents were searched again for words related to leaders and ICT. The search criteria used was “(leaders OR leadership OR principal OR head OR manage OR management) AND (technology OR ICT)”. Leadership and ICT were mentioned in six of the eight source articles. Although that proportion of articles seemed to indicate more would be revealed about ICT and leadership, it was found that only two articles indicated they were related. The first referred to meeting with school leaders in regards to ICT Professional Development and a needs analysis, for the research project.

...meetings were held with the middle-management staff, the Dean of Curriculum, and the English Head of Department for the technology PD element of the project. An initial needs analysis survey determined the school’s technology infrastructure, access to hardware and software, and the desired teaching and learning outcomes of the English teachers and their students. (Jetnikoff, 2015, p. 43)

The second reference quoted a study participant, describing the influence of the principal and leadership team on the deployment and integration of Interactive Whiteboards (IWB),

Every classroom at my school including the art, library and music rooms have IWBs installed. Our Principal and leadership team encourage our staff to embrace new technology and support us through PD and equipment. The art room was one of the first rooms to acquire an IWB due to my Principal's strong understanding of how beneficial it would be to the art program and how well it lends itself to the arts. (Lemon, 2011, p. 50)

In both cases, the quotations support the perspective that school leaders were critically important for success. The first study included important leadership roles, namely middle-management, Dean and Head of Department as part of the study design, and the second study attributed the support and understanding of the benefits to the principal and leadership teams in deploying the IWBs.

However, similar findings were not found in the remaining articles. Two reasons why seemed applicable. Firstly, that researchers who considered school leadership played some part in deploying and integrating ICT did not consider it in their study design or it was considered but not reported; or secondly, researchers considered ICT as independent of school leadership and did not refer to school leadership accordingly. Not finding examples in the other articles suggests that school leaders were perceived as needed but to a lesser extent, or not needed at all.

PD for deploying and integrating ICT

Within the articles about curriculum and school leadership from the perspectives of school leaders, students and teachers, the deployment and integration of ICT were most prominent in those from the teacher's perspective. In particular, utilising digital advertising and stories to identify PD (Jetnikoff, 2015) and digital gaming to support learning (Beavis et al., 2015). Extrapolating the connection, between ICT and PD for teachers, to broader literature about deploying and integrating ICT in the classroom, this sample confirms there is ongoing PD to support teachers, but it is not clear how much, if any, is carried out for school leaders.

Absent from the nine articles listed in Table 1, was PD related to ICT support operating within schools or sourced externally. To support the role of the school leader and the classroom teacher, a dedicated internal ICT function, ICT staff, teachers who, as part of their responsibilities, have an ICT coordinator role or external suppliers might also be available. ICT related PD and wider ICT training need to be considered, because such roles need to exhibit integrity, behave ethically and be held accountable to codes of practice (Australian Institute for Teaching and School Leadership, 2011; Burmeister, 2000, 2013; Fawkes, 2014; Professional Standards Councils, 2015; Vella, 2013). They also

need ICT-based PD to keep competent within the rapidly changing field of ICT (Al-Saggaf, Burmeister, & Weckert, 2016; IFIP & IP3, 2016; Volkman, 2013).

School leadership and leadership practices deploying and integrating ICT

Four reasons emerge from the discussion above, as to how literature on Catholic schools describe the relationship between school leaders and ICT. These range from being critical, being partially important, to not needed at all. Firstly, the relationship is one of many contexts relevant to schools. Secondly, it is one of many contexts of leadership. Thirdly, the relationship may or may not be considered relevant to researchers and subsequently considered, inferred or ignored in research design. Finally, ongoing PD to support teachers who already deploy and integrate ICT in the classroom, but may be lacking for school leaders. These four reasons for the range of relationships between school leaders and ICT raise several questions about leadership and current practice deploying and integrating ICT in Australian Catholic schools. Such questions indicate areas of further research that broaden issues seen in the nine studies of Table 1.

Implications for future research

There is growth in the broader body of knowledge about ICT and leadership both within and outside the context of schools (Al-Saggaf, Burmeister, & Weckert, 2015; Burmeister, 2015; Professional Standards Councils, 2015; Vella, 2016). Such perspectives can influence the research agenda for educational technology (Schrum, Bull, Knezek, Roblyer, & Thompson, 2005). The following questions may reflect the importance of filling this gap.

Do other forms of leadership currently within Catholic schools such as servant leadership (Lavery & Hine, 2013; Striepe & Donoghue, 2014) and contemplative leadership (Schuttlöffel, 2013) have application for deploying and integrating ICT? How do leadership practices deploying and integrating ICT connect with personal, clergy and administrative and community views of the role of principals (Coughlan, 2009)?

What about other external changes such as the new evangelisation (Schuttlöffel, 2013; White, 2011)? Are school leaders influenced by Catholic beliefs (Congregation for Catholic Education, 2014) and institutions responsible for managing ICT services (Iden & Eikebrokk, 2013)?

Do lessons about leadership learned from outside the Catholic school sector, such as Principal Instructional Technology Leadership (Townsend, 2013) and System Leadership (Boylan, 2013) apply?

Does school leader learning need to be promoted to address political, bureaucratic, PD, and commercial influences on ICT in schools (Davis, 2008; Vella, 2015)?

Conclusions

Using a systematic narrative literature review to better understand the role of School Leadership deploying and integrating ICT in the Australian Catholic school environment, nine studies were selected and reviewed. The study then analysed the articles further to draw out what was said about school leadership and the deployment and integration of ICT. Four reasons emerged concerning perceptions of the school leaders' role in relation to ICT, ranging from being critical, being partially important or not needed at all. Firstly, the relationship is one of many contexts relevant to schools. Secondly, it is one of many contexts of leadership. Thirdly, the relationship may or may not be considered relevant to researchers and subsequently considered, inferred or ignored in research design. Finally, ongoing PD to support teachers who already deploy and integrate ICT in the classroom, but it is not clear how much, if any, is carried out for school leaders. The study then analysed the articles further to draw out what was said about school leadership and the deployment and integration of ICT.

Further questions arising from the study may reflect a greater need to include these findings with future research agendas for educational technology and the importance of filling this gap. Further studies to better understand the role of school leadership and external influences on deploying and integrating ICT in Australian Catholic schools are recommended.

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