

Association for Information Systems  
**AIS Electronic Library (AISeL)**

---

ACIS 2017 Proceedings

Australasian (ACIS)

---

2017

**The importance of school leaders for deploying and integrating ICT in schools: From the perspective of Catholic rural school leaders.**

Steven Vella  
*Charles Sturt University, [svella@csu.edu.au](mailto:svella@csu.edu.au)*

Oliver Burmeister  
*Charles Sturt University, [oburmeister@csu.edu.au](mailto:oburmeister@csu.edu.au)*

Andrew Barnden  
*Box Hill Institute, [a.barnden@boxhill.edu.au](mailto:a.barnden@boxhill.edu.au)*

Arnela Ceric  
*Charles Sturt University, [aceric@csu.edu.au](mailto:aceric@csu.edu.au)*

Follow this and additional works at: <https://aisel.aisnet.org/acis2017>

---

**Recommended Citation**

Vella, Steven; Burmeister, Oliver; Barnden, Andrew; and Ceric, Arnela, "The importance of school leaders for deploying and integrating ICT in schools: From the perspective of Catholic rural school leaders." (2017). *ACIS 2017 Proceedings*. 2.  
<https://aisel.aisnet.org/acis2017/2>

This material is brought to you by the Australasian (ACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ACIS 2017 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# The importance of school leaders for deploying and integrating ICT in schools: From the perspective of Catholic rural school leaders.

## **Steven Francis Vella**

School of Computing and Mathematics  
Charles Sturt University  
Wagga Wagga, Australia  
Email: svella@csu.edu.au

## **Oliver Kisalay Burmeister**

School of Computing and Mathematics  
Charles Sturt University  
Bathurst, Australia  
Email: oburmeister@csu.edu.au

## **Andrew Barnden**

Centre for Communications and Information Technology  
Box Hill Institute  
Victoria, Australia  
Email: a.barnden@boxhill.edu.au

## **Arnela Ceric**

School of Marketing and Management  
Charles Sturt University  
Bathurst, Australia  
Email: aceric@csu.edu.au

## **Abstract**

In an era of unprecedented funding in education, a proportion of the billions of dollars being spent will influence the deployment and integration of Information and Communication Technology (ICT) in schools. School leaders will be one of many roles within schools accountable for the effective and efficient use of ICT in these environments. This paper reports the interim findings of a study to help understand more about the role of leaders in primary and secondary rural Catholic schools for the deployment and integration of ICT. The study used an online survey of a sample of principals, assistant/associate principals and leaders/head teachers/coordinators who volunteered to participate and then followed up those who agreed to be interviewed to further investigate findings. Analysis used basic statistics and qualitative interpretation to increase understanding why all participants thought their role ranged from considerably to critically important for the integration of technology, but ranged from not important to critical importance for deployment.

**Keywords** Catholic schools, school leadership, information and communication technology, ICT, perception.

## 1 Introduction

Early in this millennium, Friedman and Deek (2003) discussed why, and how, higher education institutions needed to adapt pedagogy, technology and the business of learning to keep up with trends in the role of these for virtual education. Their article has been referenced in the context of interactive online and computer-based learning (Ojiako, et al. 2011; Pale, et al. 2007; Reisslein, Seeling, and Reisslein 2005; Still, et al. 2012). However, Friedman and Deek (2003) introduced their paper in the context of institution, government and the private sector spending that was expected to funnel billions of dollars into the education industry. Fourteen years later, in an era where funding in education reaches unprecedented levels, discussion around the allocation of funding in schools for Information and Communication Technology (ICT) and its effectiveness is also increasing (Birmingham 2017; Kardaras 2016; Morrison 2017; Song 2017).

In their systematic narrative review, Vella, et al. (2017) contributed that the perceptions around the role of school leaders for the deployment and integration of ICT in Australian Catholic schools varied with the concerns of leadership, leadership's relation to ICT in the schools, research design and professional development (PD). Consequently, since school leaders can be perceived playing some role deploying and integrating ICT, which has associated costs, school leadership might influence how funding in education is spent in schools on these activities. Possibly more so, in the context of regional, rural and remote schools that require different considerations to those in major cities (Halsey 2017).

In view of increasing funding and greater involvement of leadership in a rapidly changing ICT environment in schools this paper studies influence in rural Catholic schools to further increase understanding of how important school leaders consider their role to be for deploying and integrating ICT and why. The term 'rural' is used generically to describe schools outside city locations. To do so, this paper firstly, reviews relevant studies about leadership, organisations and ICT in conjunction with Catholic schooling in an Australian context; secondly, describes the methodology used to further understand the role of school leaders for deploying and integrating ICT in rural Catholic schools; thirdly, present the findings; fourthly, analyses and discusses the findings, and finally, presents the conclusions arising.

## 2 Background

Vella, et al. (2017) suggested that the perception of school leadership in relation to ICT varied because, among other things, ICT was only one aspect related to leadership, and in schools was one of the many concerns competing for the attention of the school leader. In the context of a school, the role of school leadership could be likened to that of the Top Management Team (TMT) in information systems management literature, where the conclusion often arises that the TMT can positively, or negatively, impact the integration of ICT with both human and business resources (Liang, et al. 2007; Powell and Dent-Micallef 1997). Subsequently, this section explores school leadership, in perspective of the role of TMTs generally, deploying and integrating ICT in organisations, and the worldview of Catholic schools from Rome and other influences on the schooling context of Australia. The section then concludes with the research question.

### 2.1 Organisational leadership and ICT: literature review process

Relevant journal articles were located on Google Scholar in July 2017 by entering the search phrase "ceo integrate adopt strategy information technology role". Where 'ceo' was short for Chief Executive Officer (CEO) to find articles relating to the TMT. The words 'information' and 'technology' returned articles that contained the words information and communication technology and the abbreviation ICT. The abbreviation ICT is used interchangeably with 'technology' within this paper. The words "strategy", "integrate" and "adopt" returned articles reporting on different stages of managing ICT including assimilation. The search excluded patents and was sorted by relevance.

Of the 78,400 book and article titles returned, only articles that fit three criteria were then considered for this review. Firstly, those that had ICT in an organisational context and mentioned CEO or management in its brief description, secondly, had 1,000 or more citations, thirdly, had access to the full text and lastly, were listed in the first 150 titles returned. Although the cite count on Google Scholar would depend on many variables, citations of articles with a relatively high count (over 1,000) were considered relevant, as a few errors in citing would cause a small margin of error relative to the total.

The selection criteria and filtering returned 18 articles published between 1990 and 2011. While analysing the articles, six more were removed because they studied organisational contexts other than ICT and leadership, namely, the environment, Human Resource (HR) practices, forming alliances, and

technologies other than ICT. The remaining 12 articles were used for analysing the relationship between leadership and ICT in general. Although the range of publication dates seemed limited, the selected articles were considered relevant because their potential influence on current thinking, in some way, would be reflected by the high number of times they were referenced by articles after being published.

Alternative reviews could increase the number and date range of articles returned by changing criteria. For example, using search engines other than Google Scholar could return more relevant articles. The search criteria and description check could also be broadened or refined further to include more than the first 150 articles, or articles with a 'Cited by' count less than 1,000, or locating full articles using one or more membership-based journal databases. The limited date range returned and 'Cited by' count may be caused by, firstly, paper based articles, or articles cited needing to be found offline, or secondly, relevant topics have few authors because they are novel. Meaning that the time-frame and six-year gap of articles, between 2012 and 2017, reflect only articles referenced electronically, as well as, the practical time required for publishing an article, then for other authors finding and identifying the article as relevant to a topic, then 1,000 or more articles that cite the original article being published electronically and Google Scholar updating the count. Subsequently, the time lag may be lessened and more articles could be found in the future as electronic scanning, publishing and retrieval of articles improves.

## **2.2 Organisational leadership and ICT: findings**

After summarising and reviewing the selected articles, it was found that there were a wide variety of ways to study organisation leadership and ICT. Broadly, the articles grouped around the characteristics and purpose, research perspective and contexts of organisational leadership.

### **2.2.1 Characteristics and purpose of organisational leadership and ICT**

As expected, from seeking articles on formal leadership in organisations and ICT, each article provided some knowledge about the relationship between organisational leadership and ICT. In particular clarifying relevant characteristics of leadership (Armstrong and Sambamurthy 1999; Davenport and Short 1990; Feeny and Willcocks 1998; Thong 1999) and their purpose (Earl 1996; Feeny and Willcocks 1998; Hew and Brush 2007; Li and Atuahene-Gima 2001; Liang, et al. 2007; Porter 2001; Powell and Dent-Micallef 1997; Weill 1992; Zott, Amit, and Massa 2011).

The characteristics of leaders were found to include their commitment, support and ability to implement change arising from ICT, business systems thinking, level of authority, being innovative, building relationships, informed buying, facilitating and monitoring contracts. The purpose of leadership included planning, leading strategic, informational and transactional change, managing risk, building relationships, and aligning organisations with external requirements. This paper does not intend to add knowledge to these characteristics and purpose of leadership, but instead will consider them to help understand why leadership perceives the importance of their role in relation to ICT the way they do.

### **2.2.2 The research perspective of organisational leadership and ICT**

In each article, the perspective of their author was present, however, instead of finding one or two perspectives across all articles, nine were identified. These were industrial and process design (Davenport and Short 1990), ICT investment (Weill 1992), risk (Earl 1996), competitive advantage (Porter 2001; Powell and Dent-Micallef 1997), outsourcing (Earl 1996; Feeny and Willcocks 1998), adopting, integrating and assimilating ICT (Armstrong and Sambamurthy 1999; Hew and Brush 2007; Porter 2001; Thong 1999), innovation strategy (Li and Atuahene-Gima 2001), institutional theory (Liang, et al. 2007) and business modelling (Zott, Amit, and Massa 2011).

Subsequently, the variety of perspectives did not facilitate finding a single perspective across the studies, but instead, identified that organisations, leadership and ICT could be studied from many perspectives. However, summarising the sample, four articles considered ICT adoption, integration and assimilation, two covered the relationship between ICT competitive advantage and the other seven were from still other viewpoints. Considering the differing perspectives identified, this paper will build on the literature about adopting, integrating and assimilating ICT in line with most of the literature found.

### **2.2.3 The context of organisational leadership and ICT**

Reading the articles also revealed the variety of contexts for the papers. For example, relative organisation size included large (Armstrong and Sambamurthy 1999), small (Thong 1999) and others in between (Weill 1992; Zott, Amit, and Massa 2011). Alternatively, industry included manufacturing (Weill 1992), retail (Powell and Dent-Micallef 1997), education (Hew and Brush 2007) and a variety of others (Armstrong and Sambamurthy 1999). In addition, to a lesser extent, country. Most articles were from the US and two were from China (Li and Atuahene-Gima 2001; Liang, et al. 2007).

Subsequently, the current paper considers addressing a gap in the literature, specifically on leadership and ICT in the context of Australian Catholic schools. In addition, due to the relative size of these schools, the article will build on the knowledge about small organisations and, because of the industry and sector they operate within, Catholic education.

### **2.3 A Catholic worldview of schools**

Among other beliefs, Catholics believe the Church is One, Holy, Catholic and Apostolic (Catholic, St. Charles Borromeo, and *Congregatio pro Doctrina* 1999). Subsequently, a unified Catholic view of schools could theoretically be found in Church documents and studies of these schools. Three sources are considered. Firstly, a global view from Rome, secondly, a view in context of Australian Catholic schooling, and lastly, a general view of relatively current trends.

Viewed from Rome, Australian Catholic schools reflect similar characteristics and challenges as those in other developed countries. Miller (2006) neatly merged teachings of the Holy See with changes occurring in America where Catholic school leaders were coming more from laity, independent of any religious orders or religious communities. To preserve and promote a Catholic ethos in schools it was suggested that the ecclesial (teaching) community deliver religious formation for school leaders, in addition to the cultural and professional formation they received generally. Furthermore, the responsibility of Catholic schools educating children to adulthood needed to consider the right of parents to freely decide how to educate their child, and the right of Catholic schools to receive government funding to provide affordable education in line with other schooling options.

Within this context, Miller (2006) summarised that, Catholic schools would have a school spirit recognising that the human person lived in the world and was destined for heaven; the school and everything it did was founded on Jesus Christ; the community of families, teachers, administrators, bishops, students and the physical and sacramental environment were in communion with each other and the Church; the curriculum was authentically Catholic, educating the whole person, in line with the gospel, seeking wisdom and truth, and integrating faith, culture, and life; and that teachers and administrators practiced their faith reflecting the Christian message in word and action. However, the questions of how these qualities could be measured and by whom were left unanswered.

Soon after, other authors expanded the worldview of Catholic schools to include the country they operated in and 21<sup>st</sup> Century challenges and characteristics (Grace and O'Keefe 2007). Locally, in Australia, Pascoe (2007) suggested the characteristics and challenges included redefining the Catholic identity of the school and school leader, the increasing enrolment of Catholic and non-Catholic students, improving access to schools, affordability and meeting future needs building on current achievements; Croke (2007) recognised changing relationships between Catholic families and schools in a changing religious and political landscape; and Pell (2007) suggested schools worked with the Holy Spirit integrating Catholicism within the Australian culture to, at one level, share religious knowledge, practice clear thinking, constructively enquire and seek answers and, at another level, impart respect for reason and tradition and the call to faith, hope, and love.

Since then, the multi-faceted Catholic worldview to facilitate interaction between schools and society continued to be refined. Schuttloffel (2012) described the quandary Catholic school leaders faced from external influences, such as, "... the encroachment of accountability, government protocols, and the general rationalization of education. Clearly global trends in education, as in other areas of life, are quickly communicated through today's technologies and are often embraced without deep consideration of potential consequences. Catholic school leaders struggle to seek a balance between the positive and negative external influences on their schools" (p. 152).

### **2.4 Research question**

With this worldview of Catholic schools and the relatively established body of knowledge built around leadership and ICT in organisations there is an opportunity to seek more understanding about the role of leadership in context of rural Catholic schools and its influence on deploying and integrating technology. To build on current knowledge, and understand more, the question that drove the study was: How important do school leaders consider their role to be for deploying and integrating ICT and why?

## **3 Method**

This section explains the method used to answer the research question into leadership, ICT and organisations from the perspective of ICT deployment and integration in the context of rural Australian

Catholic schools. Guiding the research methodology is the worldview of Catholic schools held by the primary researcher collecting the data, which matches the findings of the literature review above. That is, that Catholic schools have a Catholic identity that can influence, and be influenced by, the environment and era they belong to. The rest of the section describes the strategy of enquiry, techniques and analysis used.

The study explored the perceptions of school leaders using a constructionist epistemology based on the general assumption that judgements and decisions are formed from constructed knowledge and meanings (Coughlan 2009). A constructionist epistemology was considered applicable because the study sought to understand the meanings and constructed realities school leaders hold about their role in the deployment and integration of ICT in Catholic schools. The research used a mix of techniques to collect and analyse data appropriate to a constructivist methodology (Hill, et al. 2005). A methodology increasingly more common in information systems (Al-Saggaf, Burmeister, and Schwartz 2017; Burmeister 2015). Overall, the approach was qualitative to assist interpreting the perceptions of the study participants, but, also used some quantitative survey data collection and basic analysis, similar to those done by Stuart et al. (2009), to summarise demographic information and participant responses.

Purposive sampling was employed and thus schools qualified to participate if, firstly, they were in a Regional Centre of a Catholic Diocese located geographically near the researcher and secondly, the school principal, or their representative, authorised the study to be carried out there. School leaders qualified to participate if they were employed in a formal leadership role in one of these schools. Formal leadership roles were the principal, deputy principal, assistant/associate principal, coordinators/head teachers, senior school administrators, or an equivalent formal leadership role not mentioned.

Data collection was carried out in three stages. Firstly, seeking permissions, secondly, delivering an online survey and thirdly, holding face-to-face interviews. The perceived judgements, decisions, knowledge, meanings and realities of school leaders were recorded electronically via an online questionnaire, as audio recordings of face-to-face interviews, and in written notes in a research journal. Approval to conduct the study was given by the University Human Research Ethics Committee.

Once collected, interpretivism and symbolic interactionism (Coughlan 2009) was also used to interpret human behaviour and social interaction of participants in their environment. Analysis used descriptive statistics as well as qualitative results. Survey data was exported from SurveyMonkey as a spreadsheet and opened in Excel. Answers with scores were used to construct pivot tables and graphs from the resultant statistics (Figures 1 and 2). The tables and graphics were interpreted for perceptions and meanings. Answers to open survey questions were also stored in Excel and interview transcripts were created and stored in NVivo 11. The written and aural content related to school leader perceptions were then grouped, coded and analysed for themes to reveal more about their role as leaders in rural Catholic schools deploying and integrating ICT.

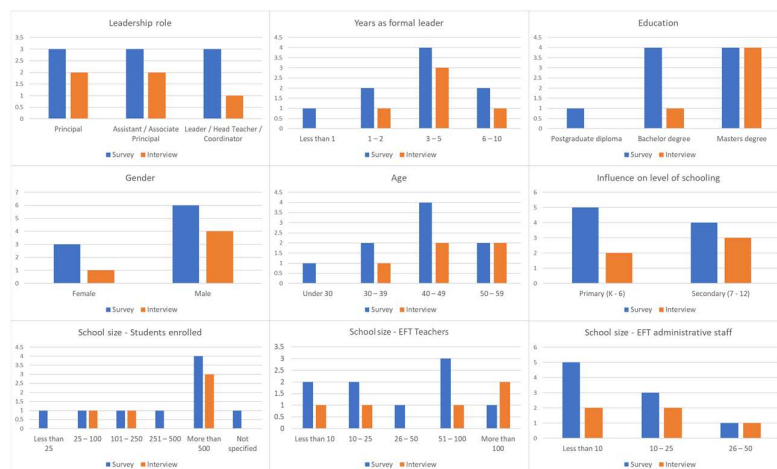


Figure 1: Classification of participants and schools



Figure 2: Perceived importance of school leaders for deploying and integrating ICT

## 4 Results

As mentioned above, data was initially collected via an online survey. Further data was then collected by semi-structured interviews. Survey participants interviewed were those that wished to assist clarifying answers or help investigate findings. Survey responses were received between October 2016 and May 2017. Interviews were held between November 2016 and May 2017. Additional data was written in the personal journal of the lead author/researcher, arising from observations of the five Catholic schools visited during the conduct of this research.

### 4.1 Participating schools and school leaders

The five schools that participated were from ten located in a single Regional Centre of a rural Catholic diocese. One high school and two primary schools were from a regional town, and two further primary schools were from two nearby villages. There were nine survey respondents, five from four primary schools and four from one high school. Of these, five were interviewed, two from two primary schools and three from the high school. Participant and school details are shown in Figure 1 giving context for the results across roles, experience, education, and other classifications.

### 4.2 Survey results

Question 11 of the survey specifically sought to answer the first part of the research question, how important was school leadership within Australian Catholic schools for deploying and integrating ICT. The question was personalised so that the participant could answer from their own experience. A 5-point Likert scale was used to present answers graphically. Figure 2 shows the results for deploying and integrating technology respectively.

Question 12 was an open question asking the respondent to qualify Question 11 with an example. Eight respondents gave examples of recent experience (Table 1). For the analysis, names of participants, schools, leadership roles, devices, applications, companies, countries, search engines, faculties and subjects were coded with generic names followed by a number, incremented the first time they appeared in the answers. Doing so protected privacy as well as kept the analysis relative to the leader's experience rather than to the entity or product discussed. For example, a participant who completed the survey was labelled P3 and both their survey and interview data were associated to P3. Similarly, generic labels identified devices, companies and other products and entities across participant answers, "All students have <device 1> or laptops, using <company 1> apps suite."

---

#### Sample of survey answers

---

P2: Twilight Staff Meeting: Staff were given information/hands on opportunities to learn about <application 3> and <application 4> app plus general ICT information to support students.

P3: Part of Executive and Technology Team that considered alternative devices for staff and student upgrades for 2017. Looked at functionality of various device, purchase cost and ongoing maintenance/insurance for each device and made final decision based on most suitable device. Coordinate student device changeovers. Coordinated student device repair and replacement procedures with ITC Staff.

P4: All students have <device 1> or laptops, using <company 1> apps suite. I am responsible for ensuring a coherent, informed and skilled use of technology as a tool to assist student learning. My role is to give clear messages to staff, students and parents about effective technology use and to ensure that staff and students have access to the necessary learning and support to make best use of the network and technology resources.

---

---

Sample of survey answers

---

P6: We use a wide range of programs in the <faculty 1> faculty including <application 5>, <application 6> and sound editing software and applications (application 7) as well as music composition software. When interviewing new staff it is important that they are adept at using a range of programs particularly where they apply to their subject area.

P8: Introduction of coding clubs which are run by me.

P9: In the last 12 months we have purchased <device 1> for each of our senior students (17 in total), have bought two <device 2>s and have installed <device 3>s around the school. We had support provided to us from the Catholic Schools Office (CSO) to set up the <device 2>s and <device 3>s but this is the extent of support provided. Any professional development or issues with technology are organised by myself. When our server went down due to a blackout in the town, I followed instructions over the phone in order to get things going again.

---

*Table 1. Examples deploying and integrating ICT*

### 4.3 Interview results

Survey participants P2, P4, P6, P8 and P9 further participated by interview. To ensure that reporting of any findings would be from the voice of the participants, the responses from each participant were separated as a participant response. Dialogue from the researcher was coded as researcher response. The following were sourced from participant responses.

To answer the second part of the research question, why did school leadership in Australian Catholic schools perceive their importance deploying and integrating ICT the way they did, participant transcripts were queried for the words “technological, technologies, technology”. In this way, examples used of the discussion would be directly connected to the integration and deployment of ICT and from the participant’s perspective. Exemplary participant interview responses are shown in Table 2.

---

Sample of responses from interview transcripts

---

P3: ... I was part of the team, but I wouldn't say I made the final decision. We looked at costing, the speed of its operation, I mean we picked <company 7> again, we think their post-purchase support has been really, really good for us. Things like warranty. Often if there is an issue with a particular style of computer... We actually had one that had a defect that hit 20-30% of the devices. They just did a complete changeover... So, we were talking about a significant amount of money, where they said, hang on that's our problem. Give us all of those back. Not just the broken ones, give us the whole lot of them. We'll replace them with an updated version... and that sort of stuff.

P4: I would say that our role, before we go anywhere near the technology, is to have a deep discussion about our purpose and we would only use technology if we can demonstrate it provides more opportunity for teachers and students to access learning and particularly, feedback ...

P6: ... What features would you start getting the kids to use? How do you break this program down into something manageable for the very first lesson where kids have never seen it? Like you personally, might be able to whiz around in <application 5> and produce all sorts of amazing things, but if you only have one hour, for the very first hour with 26 kids, what are you going to focus on? How are you going to take that program and just get the kids to do that is 1) engaging, 2) produce something that they feel proud of, 3) lead to something else that is important and is relevant to the program that is not just dry and boring. All those considerations from a teacher's perspective for a new program, so a leader, having taken on this role as a <leadership role 1>, I don't have, ... In a year...I'll learn about the <subject 1> programs, I understand there are these other programs for <subject 2> and what have you, but I am not there yet. That is a lot of learning that would have to take place.

P8: ... I mean, turn around and you can see our robot that we've got there. I went to a conference in Sydney last term which was all about coding and computational thinking so I came back fired up about it. I also went to <company 1> Head Office in Sydney so came back fired up about robotics and whatnot. Got this directly from <company 6>. 1200 pieces. We've just about finished the construction. Now we're getting to the fun part of the program and everything.



---

Sample of responses from interview transcripts

---

P9: Because we have a very small number of staff, I am the <leadership role 2>, the <leadership role 3>, the <leadership role 4>, the ICT and Special Needs. I wear all those hats, so when we decide what we need at our school, that is ultimately my decision. ... We have a significant IT department at the Catholic School's Office (CSO). So, when I first came here there were a couple of desktop computers that the children did not really have any access too. So, I asked the question, "what would be a good starting point?" The answer was laptops, so I bought and set up the laptops and then we've moved to <device 1>. For the Senior class, every child has their own <device 1>. But as far as purchasing, there is always advice, but ultimately it is up to me.

---

*Table 2. Extracts of interviews*

## 5 Discussion

The data collected provides a unique glimpse into the phenomenon of school leadership deploying and integrating ICT. The interviews give substance to the survey findings and researcher's journalled observations, by helping find out why the perceptions of the school leaders were what they were. A greater number of participants would have been desirable, however, having diocesan schools in a regional centre as a single case provides some explanation of what happened within the schools studied. The results do not assist theory development but the survey and interview results can be explained against existing theory derived from the information systems management literature reviewed above. Where the results are not supported by current theory then it suggests a gap may be evident that warrants further investigation of either the theory or the diocesan circumstances. Accordingly, this section discusses the characteristics, research perspective and context of organisational leadership and ICT of this study's findings.

### 5.1 Perceived importance of school leaders for deploying and integrating ICT

The results shown by orange bars in Figure 2 are one way to represent how important school leaders perceived their role was for deploying and integrating ICT. The spread of results between each graph is clearly not the same. For deployment, answers ranged from not at all to being critical, with four of the nine surveyed indicating they were considerably important. For integration, all chose critical or considerable, with five out of the nine surveyed indicating they were considerably important. Such a result could indicate beliefs and methods are relatively consistent between schools and school leaders for integration, but not so for deployment.

The blue bars of the graphs provide a second level of basic statistical analysis. Values were assigned to the answers on the Likert scale by scoring, critical and not at all as +2 and -2 respectively, considerable and slight as +1 and -1 respectively and moderate as 0. Totals were calculated by multiplying each score by the number of school leaders that chose them. Subsequently, scoring revealed that school leaders perceived deploying ICT as both considerably important and not important at all. Alternatively, for integration they perceived they were critically, more than considerably, important. On the one hand, the scores match the above conclusion that perception is consistent for integration, but, on the other hand, the spread of results for deployment could also indicate a need to understand why their role is perceived as considerably important, as well as, not at all.

### 5.2 Organisational leadership and ICT

To understand more about the importance of the role school leadership for deploying and integrating ICT from their perspective, answers from both survey and interview participants are discussed in terms of the characteristics and purposes raised in the literature.

#### 5.2.1 Characteristics and purpose

In deploying and integrating ICT, it seems that the purpose of leadership is closely tied to the characteristics of the school leader. The discussion, by Participant P3, around the team responsible for purchasing devices reflected not only business systems thinking (Feeny and Willcocks 1998), but also planning, informed buying, facilitating and monitoring contracts (Feeny and Willcocks 1998) and risk management (Earl 1996). The decision to invest in new devices did not just consider costs and device performance only, but also after sales support (Davenport and Short 1990; Li and Atuahene-Gima 2001). Doing so at the time of purchase, reduced disruption for individual students, their teachers and classroom when faulty devices were easily replaced by the supplier later.

Other characteristics and purpose of leadership were found in all participant answers to survey question 12. In general, their stories showed commitment (Powell and Dent-Micallef 1997), support and ability to implement change arising from ICT (Armstrong and Sambamurthy 1999) in their answers. Participants P2 and P4 discussed level of authority (Feeny and Willcocks 1998), participants P6 and P8 innovation (Zott, Amit, and Massa 2011) and P6 detailed strategic, informational and transactional change (Weill 1992) and meeting external subject requirements (Hew and Brush 2007). Participants P2, P4 and P9 discussed building relationships (Li and Atuahene-Gima 2001). Participants P8 and P9 further discussed informed buying.

### **5.2.2 The research perspective**

Overall, this report intended to study organisation and leadership from the perspective of deploying and integrating ICT. As expected, the analysis of participant interviews identified stories that matched the themes around deployment (P3, P8 and P9) and integration (P6 and P8) raised by Armstrong and Sambamurthy (1999), Hew and Brush (2007), Porter (2001) and Thong (1999) but additional themes were found for communication (P4), support (P3 and P9), and leadership roles (P3) that help understand deployment and integration more. These perspectives could have some relationship to characteristics and purpose discussed earlier. For example, communication would be important for discussing and identifying device requirements with team members and suppliers. Device support would be considered important where business systems, planning and risk management are important. Leadership roles would be considered important when staff resources are limited.

This finding is in line with the earlier finding from the literature review, that there were many perspectives of organisational leadership and ICT, but might also suggest some worth in investigating the relationship between perspective and both the characteristics and purpose of school leadership. Subsequently, future studies to investigate the relationship between perspective, characteristics and purpose of leadership are encouraged to help further understand the role of leadership for the deployment and integration of ICT in schools.

### **5.2.3 The context**

The five participating schools had approximately 100 staff or less. In the literature review, organisations with this number of employees were considered relatively small businesses (Thong 1999). It is interesting that the responses of participant P4 seemed positive, regarding, openness to innovation, and being able to understand and evaluate the benefits of technology. These were considered by Thong contributing factors for the successful adoption of information systems. An alternative research design might have confirmed whether that was the case for P4 and whether Thong's other suggestion also applied. That is, the size of the organisation and amount of information needed to process determined the extent of adoption.

Up to this point, little distinguishes the concerns of a rural Catholic school leader with those of public or independent schools within the same region. However, participants P8 and P9 both referred to the CSO and, P3 and P7 referred to their internal technology support and team. On the other hand, in the full transcripts, all participants referred to at least one of seven commercial companies, one of four devices or one of 12 applications that could easily be used at other schools. These references might show two aspects of the worldview of Catholic schools coming through. Firstly, that these commercial companies, devices and applications are examples of many influences on the schools (Schuttloffel 2012) and, secondly, there were interactions with the CSO and internal technology support and teams (Miller 2006). In some ways, these interactions show school leaders as spiritually being in communion with others, and the Church, who share common beliefs and practices (Miller 2006). If so, further study into these interactions might reveal them as a characteristic that uniquely identifies these schools and possibly worth understanding more.

## **6 Conclusion**

A systematic review of literature on organisational leadership and ICT revealed studies in this area had similar attributes clarifying aspects of character and purpose of leadership, research perspective and context of leadership. Similarly, defining a worldview of Catholic schooling from the view point of Rome, Australia and elsewhere found that the character and purpose, research perspective and context could also apply to Catholic schools. In this study, school leaders had similar perception of their importance for integration, but, were diverse for deployment. With weighted scores highlighting, not at all and considerably important. Analysing the results from the viewpoint of character, purpose, research perspective and context found examples in line with the leadership and ICT literature, but the link with the Catholic worldview was less evident. The study of rural Catholic school leaders and ICT reported in

this article appears to indicate that character, purpose, perspective and context are attributes of leadership, the importance of which has not previously been evidenced in the literature.

## 7 References

- Al-Saggaf, Y., Burmeister, O.K., and Schwartz, M. 2017. "Qualifications and Ethics Education: The Views of Ict Professionals." *Australasian Journal of Information Systems* 20.
- Armstrong, C.P., and Sambamurthy, V. 1999. "Information Technology Assimilation in Firms: The Influence of Senior Leadership and It Infrastructures." *Information systems research* 10, no. 4: 304-327.
- Birmingham, S. 2017. *Action Needed Now to Retain Australia's Leading Education System: Minister*.
- Burmeister, O.K. 2015. "Improving Professional It Doctorate Completion Rates." *Australasian Journal of Information Systems* 19.
- Catholic, Church, Church St. Charles Borromeo, and Fidei Congregatio pro Doctrina. 1999. "Catechism of the Catholic Church."
- Coughlan, P. 2009. *The Mission of the Catholic School and Role of the Principal in a Changing Catholic Landscape*: Australian Catholic University.
- Croke, B. 2007. "Australian Catholic Schools in a Changing Political and Religious Landscape." *International handbook of Catholic education*: 811-833.
- Davenport, T.H., and Short, J.E. 1990. "The New Industrial Engineering: Information Technology and Business Process Redesign." *Sloan Management Review* 31, no. 4: 11.
- Earl, M.J. 1996. "The Risks of Outsourcing It." *Sloan Management Review* 37 (1996 Spring).
- Feeny, D.F., and Willcocks, L.P. 1998. "Core Is Capabilities for Exploiting Information Technology." *Sloan management review* 39, no. 3: 9.
- Friedman, R.S., and Deek, F.P. 2003. "Innovation and Education in the Digital Age: Reconciling the Roles of Pedagogy, Technology, and the Business of Learning." *IEEE Transactions on Engineering Management* 50, no. 4: 403-412.
- Grace, G.R., and O'Keefe, S.J. 2007. *International Handbook of Catholic Education*. Vol. 2: Springer.
- Department of Education and Training. 2017. *Independent Review into Regional, Rural and Remote Education: Discussion Paper 2017*, by Halsey, John.
- Hew, K.F., and Brush, T. 2007. "Integrating Technology into K-12 Teaching and Learning: Current Knowledge Gaps and Recommendations for Future Research." *Educational technology research and development* 55, no. 3: 223-252.
- Hill, C. E., Knox, S., Thompson, B. J., Williams, E. N., Hess, S. A., and Ladany, N. 2005. "Consensual Qualitative Research: An Update." *Journal of counseling psychology* 52, no. 2: 196.
- Kardaras, N. 2016. "Screens in Schools Are a \$60 Billion Hoax." *Time Ideas* (1/9/2016).
- Li, H., and Atuahene-Gima, K. 2001. "Product Innovation Strategy and the Performance of New Technology Ventures in China." *Academy of Management Journal* 44, no. 6: 1123-1134.
- Liang, H., Saraf, N., Hu, Q., and Xue, Y. 2007. "Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management." *MIS quarterly*: 59-87.
- Miller, J.M. 2006. *The Holy See's Teaching on Catholic Schools*: Sophia Inst Press.

- Morrison, S. 2017. *Budget 2017 - Guaranteeing the Essentials for Australians. Budget 2017-18*: Commonwealth of Australia.
- Ojiako, U., Ashleigh, M., Chipulu, M., and Maguire, S.. 2011. "Learning and Teaching Challenges in Project Management." *International Journal of Project Management* 29, no. 3: 268-278.
- Pale, P., Miletic, I., Kostanjcar, Z., Pandzic, H., & Jeren, B. 2007. *Pyramidia-an Integrative E-Learning Tool. EUROCON, 2007. The International Conference on "Computer as a Tool"*: IEEE.
- Pascoe, S. 2007. "Challenges for Catholic Education in Australia." In *International Handbook of Catholic Education*, 787-810: Springer.
- Pell, G. 2007. "Religion and Culture: Catholic Schools in Australia." *International handbook of Catholic education*: 835-845.
- Porter, Michael E. 2001. "Strategy and the Internet." *harvard business review*: 1.
- Powell, T.C, and Dent-Micallef, A. 1997. "Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources." *Strategic management journal*: 375-405.
- Reisslein, J., Seeling, P., and Reisslein, M. 2005. "Computer-Based Instruction on Multimedia Networking Fundamentals: Equational Versus Graphical Representation." *IEEE Transactions on Education* 48, no. 3: 438-447.
- Schuttloffel, M.J. 2012. "Catholic Identity: The Heart of Catholic Education." *Journal of Catholic Education* 16, no. 1: 148.
- Song, J.S. 2017. "Pisa and Digital Literacy." (28/11/2016).
- Still, K., Huhtamäki, J., Isomursu, M., Lahti, J., & Koskela-Huotari, K. 2012. "Analytics of the Impact of User Involvement in the Innovation Process and Its Outcomes. Case Study: Media-Enhanced Learning (Mel) Service." *Procedia-Social and Behavioral Sciences* 46: 1740-1746.
- Stuart, L.H., Mills, A.M. and Remus, U. 2009. "School Leaders, Ict Competence and Championing Innovations." *Computers & Education* 53, no. 3: 733-741. Accessed 25 Apr 2014.  
<http://dx.doi.org/http://dx.doi.org/10.1016/j.compedu.2009.04.013>.
- Thong, James Y.L. 1999. "An Integrated Model of Information Systems Adoption in Small Businesses." *Journal of management information systems* 15, no. 4: 187-214.
- Vella, S. F., Burmeister, O. K., Ceric, A., & Barnden, A. 2017. "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." *eJournal of Catholic Education in Australasia* 3, no. 1: 4.
- Weill, P. 1992. "The Relationship between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector." *Information systems research* 3, no. 4: 307-333.
- Zott, C., Amit, R., and Massa, L. 2011. "The Business Model: Recent Developments and Future Research." *Journal of management* 37, no. 4: 1019-1042.

## Copyright

**Copyright:** © Vella, Burmeister, Barnden and Ceric. This is an open-access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 3.0 Australia License](https://creativecommons.org/licenses/by-nc/3.0/au/), which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and ACIS are credited.