

The Role of the Principal in an Information Literate School Community: Design and Administration of an International Research Project

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Abstract

Principal support is a key factor in the implementation of effective programs in schools. An international study of the principals' role in developing and supporting information literate school communities has been conducted in Australia, Canada, Finland, France, Japan, Scotland, and South Korea. One of the unique features of the study was the use of online data collection and analysis techniques. In this paper, the researchers describe the design and administration of the international project and explore the methodological issues involved. This information will be of interest to researchers interested replicating the study or in designing a similar study. The completed research should provide information that will be useful to principals and teacher-librarians in countries throughout the world, as they struggle in difficult times to provide quality schooling and information services and to contribute to the development of literate and independent library users.

Development of the International Study

During the 1990s, the authors of this paper have been developing a program of research investigating the role of the principal in relation to school library programs and services. In 1996, they obtained funding from the International Association of School Librarianship (IASL) and the International Federation of Library Associations and Institutions (IFLA) for an international study of the role of the principal in developing an information literate school community. The study has been carried out in seven countries: Australia, Canada, Scotland, Finland, France, Japan, and South Korea. Up to this point, research findings have been disseminated primarily through conferences of IASL and IFLA. Because of the international context of this program of research, the authors have chosen to use the terminology most frequently used in the participant countries and in the research instruments used for the study, that is, "teacher-librarian" and "school library."

This program of research has its roots in qualitative work done by Dianne Oberg and Linda LaRocque in Canada (LaRocque and Oberg 1991; Oberg 1996). Lyn Hay and James Henri then carried out a study in Australia, based on the Canadian study. Findings from the Canadian study were presented at the 1990 conference of IASL (LaRocque and Oberg, 1990), and findings from the Australian study were presented at the 1995 IFLA Schools Section Open Session and in Australia (Hay and Henri 1995; Henri and Hay 1996). The qualitative studies, conducted by Oberg and LaRocque and by Hay and Henri, provided analyses of the ways that principals working within information literate school communities are able to support the work of teacher-librarians. The projects also identified the methods used by teacher-librarians to involve the principals in the development of effective school library and

information services. The Canadian project involved 5 schools in Alberta while the Australian project was undertaken in 6 schools in New South Wales.

While the qualitative studies had provided in-depth understanding of a small sample of schools in two countries, the researchers felt that it was important to test the validity of these findings through a quantitative study. Having identified the factors of influence and support that exist between the principal and the teacher-librarian through qualitative studies, the researchers undertook the development of quantitative instruments to test the existence of these factors across a broader range of schools and in a larger number of countries. Thus, the international research project entitled "The Role of the Principal in an Information Literate School Community" was developed and implemented. This paper will focus on the development and administration of the international research project.

The international study involves a quantitative investigation, surveying both principals and teacher-librarians about principal support, making use of data from the original qualitative studies. Involvement of other countries in the program of research began at the 1995 IFLA conference where Hay presented a paper on the six-school study in Australia. Based on expressions of interest at that conference, funding was sought from both IFLA and IASL. For the 1997 IFLA conference, Hay, Henri, and Oberg organized a full day workshop. Four papers were given on the research related to the role of the principal in an information literate school community (Dogg Hafsteinsdottir 1997; Henri and Hay 1997; Moore 1997; Oberg 1997), and a workshop was held for members of the International Research Reference Group (IRRG) representing the seven countries involved in this international study (see Table 1).

The role of this group was to: (a) provide input and advice regarding the adaptation and translation of the quantitative and qualitative instruments for their country; and (b) plan and administer the procedures for data collection, analysis, and reporting of findings for their country.

Table 1 International Research Reference Group

Australia	James Henri Lyn Hay Senior Lecturer Lecturer, School of Information Studies, Charles Sturt University, Wagga Wagga
Canada	Dianne Oberg Associate Professor, School of Library and Information Studies, University of Alberta, Edmonton
Finland	Liisa Niinikangas Information Specialist and Partner, Lighthouse Consulting, Tampere
France	Colette Charrier President of FADBEN and Teacher-librarian, Lycee Guez de Balzac, Angouleme
Japan	Setsuko Koga Professor, Department of Education, Aoyama Gakuin University, Shibuyaku
Scotland	James Herring Head of School (Acting), Department of Communication and Information Studies, Queen Margaret College, Aberdeen
South Korea	Yoon Ok Han Professor, Department of Library and Information Science, Kyonggi do University, Suwon-City

Principal Support in the Professional and Research Literature

Over the past three decades there have been frequent references in the professional literature of teacher-librarianship to the concept of principal support but there have been fewer references in the research literature. Shields (1987) and Charter (1982) found that principal support was critical to the development of school library programs. Dekker (1989) found that school district administrators were also important in enabling principals to support library programs in their schools. Corr (1979) and Turner (1980) found that principal attitude was positively correlated to program implementation. Hellene (1974) and Yetter (1994) found that principal support for the school library program involves such things as encouraging its use by teachers and students, integrating the program into the curricular work of the school, and providing flexible scheduling. Wilson, Blake and Lyders (1993) found that many principals were hampered in their support for school libraries by lack of knowledge about the management and function of school libraries. Table 2 (Oberg 1996) provides a summary of the professional and research related to the concept of principal support for the school library program, a key factor in the development of an information literate school community.

Table 2 Principal Support in the Professional and Research Literature

Support for the School Library Program Professional Literature Research Literature

Working directly with teachers

- expectations
 - professional development
- Astrom et al. 1989;
Baker 1980; Carson 1989;
Davies 1979; Fox 1982;
Loertscher 1988;
Lundin 1983;
Podemski 1990; Yesner and Jay 1987
Charter 1982;
Hellene 1974

Demonstrating personal commitment

- explicit valuing of program
 - using program in own teaching
 - visible in library
- Carson 1989; Davies 1979; Fox 1982; Grant 1988; Kuehn 1975; Loertscher 1988; Lundin 1983;
Morris, Gillespie and Spirt 1992; Prozano and Prozano 1987; Yesner and Jay 1987

Enabling the program

- materials/clerical staff budget
- flexible scheduling
- includes program as an integral part of school's curriculum work (planning, evaluating)

Astrom et al. 1989; Baker 1980; Browne and Burton 1989; Carson 1989; Davies, 1979; Fox 1982;
Hamilton 1983; Kuehn 1975; Loertscher 1988; Lundin 1983; Morris, Gillespie and Spirt 1992;
Podemski 1990; Prozano and Prozano 1987; Yesner and Jay 1987 Charter 1982; Dekker 1989;
Hellene 1974; Shields 1977; Turner 1980; Wilson, Blake and Lyders 1993; Yetter 1994

Support for the Teacher-Librarian Professional Literature Research Literature

Providing visibility/importance

- makes time for meetings with TL
 - trusts TL's knowledge / expertise
 - encourages TL's personal and professional development
- Baker 1980; Carson 1989; Davies 1979; Hamilton 1983; Kuehn 1975; Morris, Gillespie and Spirt
1992; Yesner and Jay 1987

Note: See Appendix for citations of references in the Introduction and in Table 1.

Research Methodology

Design of the Instruments

Questionnaires, based on the interviewee data fields used and the key factors resulting from the original qualitative studies, were developed and tested in Australia. The piloting of these instruments was conducted in Australia using standard hard

copy questionnaires. The Internet was used to distribute the pilot instruments to volunteer members of the Australian listserv OZTL_NET; however, the inability of many respondents to translate e-mail attachments resulted in the faxing and/or snail-mailing of instruments to the majority of the participants in the piloting.

Two model questionnaire sets—one for principals and one for teacher-librarians—were developed. The three instruments in each of the questionnaire sets included both closed-choice and open-ended questions. The closed-choice questions in Instrument 2 employed a five point scale, with a zero weighting for the additional category “cannot comment.” The traditional five point scale was rejected because the instruments were lengthy and it was felt that there might be an interest in over-using a mid point.

One of the goals of the researchers was to review their overall research design and methodology in light of their experience with this international project. Below the researchers discuss the design of each of the three instruments used in the study and some of the problems encountered in the data collection process. The researchers also describe the online approach to data collection that was used in the study and explore the advantages and challenges of such an approach.

Instrument 1: Demographics

Instrument 1 was designed to identify demographic variables for each of the country samples including the personal and professional characteristics of the principals and teacher-librarians and the characteristics of individual schools. Principal and teacher-librarian respondents were required to complete different versions of Instrument 1. Both principals and teacher-librarians were required to provide their own personal and professional details. In addition, the principals were asked to provide some whole school data, while the teacher-librarians were asked to provide specific school library resource centre data. The researchers decided to split the demographic data across both versions of Instrument 1 to avoid duplication of school-based demographic data and to reduce the data input burden for both principals and teacher-librarians. Examples of the Australian online versions of Instrument 1 can be found at http://farrer.riv.csu.edu.au/principal/survey/PR1_au.html and http://farrer.riv.csu.edu.au/principal/survey/TL1_au.html.

Principal Demographics

Table 3 summarizes the demographic variables for the principal version of Instrument 1. Question 1 contained closed-choice questions, where respondents were asked to select a category or value that best defined their individual school type. A standardized set of values—‘government’, ‘community’ and ‘private’—was devised to define the different types of school systems, and then the labels of these values were edited into the preferred terminology of the educational system for each country. For example, the Australian principal instrument used only the two values of ‘government’ and ‘non-government’, whereas the Finland instrument used all three standardized values (see Table 1). The Finland version also asked for two additional types of values: (a) whether the school was identified as a ‘specialty’ school (i.e., arts, sports, etc.); and (b) whether the school was included in the experimental school reform movement—both specific to current educational administration in Finland.

A set of values for the grade variable type was also ‘customized’ to reflect the climate of each country’s school system, and included an additional ‘open’ value of ‘Other’ to ensure that all grade ranges were identified correctly. For example, the Canadian instrument listed the range of grade values as ‘K-6’, ‘7-12’ and ‘Other’, whereas the Japan instrument used the values ‘1-6 elementary’, ‘1-3 middle school’,

'1-3 high school' and 'Other'. The customization of Principal Instrument 1 for each country lead to a total of 8 grade level values across the seven nations including K-6, 1-6, K-10, 7-9, 7-10, 7-12, 10-12 and 11-12. The integrity of each of these values was kept, rather than collapsing them into, say, three standardized values, for the purpose of permitting more meaningful future analyses, for individual countries and for cross-country comparisons.

Table 3 Variables for Principal Instrument 1

Question and/or	Variable	Value
1. Type of school**	System	Government
		Community
		Private
Grade	K-6	
	7-10	
	11-12	
	Other	
Location	Rural	
	Urban	
2. Size of school	No. of teachers	
No. of teacher-librarians		
or days/hours per week		
3. No. of Internet connections in school		
4. No. of Internet access points (terminals) in school		
5. Principal's age		
6. Principal's gender		
7. Principal's academic qualifications		
8. No. of teaching years prior to appointment as principal		
9. No. of years in current position as principal		
10. No. of years in Executive positions:		
11. No. of teacher-librarians worked with since becoming a principal		
12. Membership in professional associations (please name):		
** Note: The values for the type of school variables varied across countries.		

Questions 5 and 6 were also closed choice questions for the variables of principal age and gender. Respondents were asked to select from the age range scale of '20-29,' '30-39,' '40-49,' '50-59' and '60+' years, and from the gender scale of 'Female' or 'Male.' All other questions were answered using an open field, rather than closed value scales. Some countries encountered problems with the open field design of the second variable in Question 2 where principals were asked to identify the number of days or hours per week worked by the teacher-librarian where the position was not full-time, i.e., 5 full school days per week. Some respondents indicated a number without clarifying whether that value was representing either a unit of one day or a unit of one hour. The data entered by subjects was 'open', and the instrument designers had not foreseen the number of ways this data could be packaged. For example, a TL who teaches for 3 days could be entered as either: (a) 3 days; (b) 0.6 of a position, or (c) 18 hours per week. While the majority of data could be coded correctly, some data was ambiguous and could not be used as an accurate measure. This was the major flaw in survey instrument PR1. This flaw led to the data for this variable being invalid for the country of Japan, whereas this problem did not arise for South Korea because only those schools employing a full-time teacher-librarian were surveyed.

Questions 3 and 4 required principals to record the total number of Internet

connections in the school and the total number of Internet access points (or computer terminals) in the school. These questions were designed to identify the extent of Internet access throughout the school. However, both questions caused some confusion for respondents in that some respondents could not make a distinction between the terms 'connection' (i.e., the number of connections via a modem pool or dial-up connections available at any one time) and 'access points' (i.e., the number of terminals throughout the school that allowed users to access the Internet). As a result, the data from both Question 3 or 4 could not be reliably used. However, the term 'access points' seemed to be better understood by respondents in most countries and, therefore, the Question 4 data seems to reflect more accurately the level of Internet access for each country.

The remaining six questions on Principal Instrument 1 focused on principals' professional education and experience. For principals' academic qualifications (Question 7), the assigned value range consisted of 'Bachelors Degree or undergraduate equivalent,' 'BA/ Diploma Ed/ Honours,' 'Masters or postgraduate degree' and 'PhD.' Questions 8, 9 and 10 were designed to determine how many years the principal respondent had been teaching before taking on the position of principal, how many years they had held their current school position as principal, and the total number of years that the respondent had functioned at the school executive level. Question 11 sought to identify the number of teacher-librarians the respondent had worked with since becoming a principal, while Question 12 required respondents to list the names of professional associations to which they belonged.

Teacher-Librarian Demographics

The teacher-librarian version of Instrument 1 was designed to identify demographic variables of the school library resource centre (SLRC) and the teacher-librarian position, as well as characteristics of the individual person holding the position of teacher-librarian in the school. Table 4 summarizes the demographic variables for the teacher-librarian version of Instrument 1.

Questions 1 and 2 were designed to identify the level of Internet access in the school library resource centre compared with that in the overall school (based on Questions 3 and 4 in the Principals Instrument 1). Once again there was some confusion among respondents about the difference between 'connections' and 'access points'. Questions 3 and 4 were closed choice questions for the variables of teacher-librarian age and gender. Respondents were asked to select from the same age and gender scales used for principals. The remaining nine questions on this version of Instrument 1 focused on the teacher-librarian's professional education and experience. An additional value of 'Certificate/TAFE/Trade' was included in the teacher-librarians' academic qualification (Question 5) range to that of the principal range. While Questions 6 and 7 asked how many years the respondent had been teaching before taking on the position of teacher-librarian and how many years they had held their current position as teacher-librarian, Questions 9 and 10 were designed to determine the activity of the teacher-librarian in informal leadership ('pseudo-executive') positions and/or formal executive positions. Question 8 was designed to identify whether the teacher-librarian position had been filled using a merit selection process, as opposed to allocation of teacher-librarian positions according to internal transfer coordinated at the educational system level. Questions 11, 12 and 13 were used to identify the level of professional development activity of the teacher-librarian based on membership in professional associations and on listservs, and reading of professional journals.

Instrument 2: Perceptions and Beliefs

Instrument 2 was designed to identify the level of principal support for the school library program and the teacher-librarian. Principals answered 50 questions while teacher-librarians answered 53 questions, using 5-point rating scales. Instrument 2 was divided into two parts: (a) perception factors, and (b) belief factors. Examples of the Australian online versions of Instrument 2 can be found at http://farrer.riv.csu.edu.au/principal/survey/PR2_au.html and http://farrer.riv.csu.edu.au/principal/survey/TL2_au.html.

Part A: Perception Factors

Principal and teacher-librarians were required to complete identical versions of the 31 perception questions in Instrument 2. Respondents were asked to firstly rate the level of attention they perceived the principal to give each item at present using the rating scale, A Lot - Some - Little - None or Cannot Comment, and secondly, to rate (using the same scale) the level of attention they would like to see the principal give each item in the future. Table 5 groups the perception items of principal support surveyed in Part A according to the four types of principal support identified earlier in Table 2.

Table 4 Variables for Teacher-Librarian Instrument 1

Question and/or Variable	Value
1. No.of Internet connections in SLRC	
2. No.of Internet access points (terminals) in SLRC	
3. Teacher-librarian's age	
4. Teacher-librarian's gender	
5. Teacher-librarian's academic qualifications	
6. No.years of teaching prior to appointment as teacher-librarian	
7. No.of years in current position as teacher-librarian	
8. Were you appointed to an advertised position?:	
9. Are you an Advanced Skilled Teacher (AST)?	
10. No.years served in Executive positions	
12. Membership in professional associations (please name):	
12. Subscription to teacher-librarian listservs	Yes
	No
	If Yes, please name these listservs
13. Teacher-librarian journals read (please name)	

Part B: Belief Factors

Principal and teacher librarians were required to complete different versions of belief statements in Instrument 2. While both respondent groups were asked to indicate the strength of their belief for each of the items using the scale, Strongly Agree - Agree - Disagree - Strongly Disagree - Cannot Comment, the principal instrument consisted of 18 belief statements whereas the teacher-librarian instrument consisted of 21 belief statements. Table 6 lists the belief statements (in a shortened version) regarding principal support surveyed in Part B. These belief statements were designed to indicate the strength of and alignment between principal and teacher-librarian beliefs about the roles of principals and teacher-librarians in developing and supporting an information literate school community. The belief statement responses can also be used to shed more light on the results found regarding principal attention in Part A. In retrospect, asking the additional questions of both principals and teacher-librarians would have increased the value of the data generated from these

questions. For example, in relation to the teacher-librarian role being good preparation for the principal position, the principals might have had quite different views from those that were expressed by the teacher-librarians and this is information that would enrich teacher-librarians' understanding of how their role is perceived by the principal.

Table 5 Support for the School Library Program

Support for the School Library Program	Perception Question No./Item
Working directly with teachers	3. Facilitate professional development (PD) of staff
5. Support collaboration between TL & staff	
9. Encourage staff involvement in development of SLRC	
10. Encourage staff invest time to CPPT with TL	
11. Facilitate staff PD in understanding & use of IT	
12. Inform new staff re importance of collaboration with TL	
24. Encourage staff to use wide range of resources in teaching	31. Seeks staff feedback re quality of SLRC services
Demonstrating personal commitment	4. Advocate TL role in school curriculum
14. Encourage staff debate re information policy	
18. Visit SLRC to observe work of TL	22. Seek advice from TL re whole school information management
Enabling the school library program	1. Facilitate development of ILSC
2. Ensure information literacy in school plan	
6. Ensure SLRC reflects school goals	
7. Ensure appropriate allocation of support staff	
8. Allocate adequate, flexible time for TL	
13. Support currency/relevancy of SLRC collection	
15. Ensure significant funding allocated to SLRC budget	
16. Seek outside funding to supplement SLRC budget	
28. Encourage information skill integration and assessment by staff	30. If TL not on key committee, PR ensures SLRC needs addressed
Support for the Teacher-Librarian	Perception Question No./Item
Providing visibility/importance	17. Engage in regular/timely communication with TL
19. Encourage TL to debate/justify current practice	
20. Ask questions of TL re teaching & learning	
21. Rely on TL to keep PR abreast of developments re TL role	
23. Encourage TL to take risks	
25. Encourage TL leadership in development of info skills continuum	
26. Work with TL to develop his/her personal PD plan	
27. Advocate TL as member of key schoolwide committees	29. Provide time release & funding for TL's ongoing PD

Table 6 Common Beliefs

Qu No.	Belief Statements
32	TL as a key player in school's information literacy programs
33	TL ought to have education and librarianship qualification
34	TL ought to be appointed according to a merit selection process
35	An unqualified TL appointment should undertake a specialist qualification in TLship
36	TL should spend all of his/her day in the SLRC
37	Staff development plans should address development of teachers' information literacy
38	TL should be timetabled to cover classroom teachers' RFF time
39	TL is an information technology (IT) leader in the school

- 40 TL should provide flexible timetable for needs of individuals, groups, whole classes
- 41 Internet access should be available through the SLRC
- 42 Students should have individual access to the SLRC during class time
- 43 Principal should supervise the TL
- 44 TL should provide appropriate inservicing to teaching staff
- 45 Principals should act as role models/mentors to staff reticent about use of IT
- 46 CPT should occur in classrooms as well as SLRC
- 47 When TL is absent, it is necessary to fill position with qualified replacement
 - 48 TLs should be supported to achieve AST status and appropriate executive positions
- TL49/
- PR50 PR is well placed to judge TL's professional competence
 - Principal Beliefs (Additional)**
 - PR49 PR's acceptance of TL's professional judgement relates directly to his/her credibility
 - Teacher Librarian Beliefs (Additional)**
 - TL50 TL is responsible to educate PR about role of the TL
 - TL51 TL should inform PR about issues affecting potential of SLRCs
 - TL52 TL is good preparation for position of Principal
 - TL53 TLs seek mentorship from teaching staff in addition to that provided by PR

Instrument 3: Additional Information

Instrument 3, composed of open-ended questions, was designed to elicit additional information from principals and teacher-librarians in a qualitative format. Nine of the open-ended questions were the same for principals and teacher-librarians. These questions invited respondents to make comments related to the strengths and challenges of the school library, the contributions of teacher-librarians to teaching and learning, the nature of information literacy, barriers to integration of information skills, the promotion of the school library, and the respondents' roles in developing and supporting an information literate school community. Teacher-librarians were asked two extra questions related to ways they used to maintain their credibility as teacher-librarians and ways that their principals could provide them with additional support. Examples of the Australian online versions of Instrument 3 can be found at http://farrer.riv.csu.edu.au/principal/survey/PR3_au.html and http://farrer.riv.csu.edu.au/principal/survey/TL3_au.html.

In retrospect, asking principals the two extra questions would have provided useful information about teacher-librarian credibility and about the nature of principal support. The level of response to these open-ended questions varied from country to country with the Canadian and Australian respondents providing the most lengthy and detailed comments. This raises some interesting questions. This may have been related to the fact that the open-ended questions were framed initially by the Australian researchers; the questions may have been framed in terms that were more meaningful for the Australians and Canadians, two respondent groups with more similar educational systems than those of the other countries.

Developing an Online Approach to Data Collection

In-school research is typically slow. Gaining approval to conduct the research involves meeting the demands of approval protocols: completing numerous forms, providing sample instruments, indicating timelines, and dealing with many levels of authority. In addition, the candidate respondents, especially principals, are very busy professionals. School and district authorities are often reluctant to approve proposals that will add demands to already over-worked professionals. It was with these factors in mind that the decision was made to transfer the administration of the questionnaires from a snail-mail, paper-based approach to an online, Web-based approach.

Lyn Hay was the IRRG Website Coordinator and consulted with IRRG members to adapt and translate the questionnaires to be mounted as interactive HTML forms on the IRRG Principals Project website. Figure 1 illustrates the homepage of the IRRG Data Collection site at <http://farrer.riv.csu.edu.au/principal/survey/survey.html>:

Each country was given its own homepage on the data collection site. This was designed to provide a direct gateway for subjects wishing to submit their answers to questions online. Figure 2 illustrates the Australian homepage on the IRRG Data Collection site at <http://farrer.riv.csu.edu.au/principal/survey/australia.html>. This format became a template for all other country homepages.

From the country homepage both principal and teacher-librarian respondents could elect to complete each questionnaire. E-mail contact details for the IRRG members were provided on each webpage as well as the e-mail contact details for the Website Coordinator and the Internet Special Project Group (ISPG), who designed the data collection programming tools.

Each school was assigned a School Identification Number (SIN) which was an essential requirement for online data entry. The principal and teacher-librarian of a school were given the same number, ensuring the data sets from each could be electronically matched and manipulated in preparation for the data analysis phase. Three instruments were used to collect data. Instrument 1 included a combination of pull-down menu selection of set fields, and short and open-ended question fields. Instrument 2 collected data using a series of pull-down menus. Instrument 3 collected responses to 12 open-ended questions which were entered using a series of open window fields. All raw data was tagged by the SIN and the instrument number. An “accept data” webpage was generated to confirm a respondent’s successful submission of an online instrument.

The online questionnaires employed a simple Common Gateway Interface (CGI) script to capture data in a form that could be processed by Standard Generalized Markup Language (SGML ISO 8879:1986 see: <http://www.sil.org/sgml/sgml.html>) tools. The CGI scripts were written in Python (see: <http://www.python.org>), a programming language that is much easier to write than the scripting language popularly used for scripting, Perl (see: <http://www.perl.org>). Python was also used to convert the questionnaire data into a suitable form for processing.

Evaluation of the Online Approach

The main challenge in designing the online data collection site was making sure the complex questionnaires had unique field names for each of the questions. In future, it would be preferable to write a script to generate the HTML questionnaires. A questionnaire could be marked up according to an Extensible Markup Language (XML, see: <http://www.sil.org/sgml/xml.html>), DTD, and a script written to generate the final online document. XML is a simplified version of SGML designed for online applications. It is likely to replace HTML as it is much more versatile.

Just as the administering of a traditional snail-mail based questionnaire is fraught with possible delays, e.g., postal strikes, non-delivery, incorrect delivery, and

so on, so too is an online product. This case was no exception and there were a number of minor problems typically associated with the online operation. The server was subject to several power failures (as part of ongoing building construction at CSU) and outages (as networks systems were being improved). The unique SIN would have been more reliable had it included a check digit which would have guarded against a respondent entering an incorrect number. Although the snail-mail versions of the instruments were tested through the pilot process, the online versions received only in-house testing. Previous experience with programming of online instruments had ensured that the system was robust enough to cope with the typical errors (although the original error message was the somewhat facile “programmer error”). Error reports from some respondents indicated that more robust public testing of the online versions would have been beneficial.

One potential problem, associated with the online version of Instrument 2, was related to the choice of default. When designing the online version the default had been set at “a lot” and “strongly agree” with the thought that this would force respondents to make a choice. What had been overlooked was that a respondent who ignored a question would (by default) be entering a value. Fortunately, a careful inspection of the data showed that this did not happen. However, in future, the default will be set at “Please Select.” Another way to address this problem might be to replace the pull-down menus with radio buttons, which would save respondent time and which would be more user-friendly to Internet novices.

Hard returns made in the boxes provided for open-ended responses also caused problems for data importation in preparation for data analysis. A hard return was read by the program as being a discrete, new piece of data when in actual fact it could have been one of a series of points entered as an answer for one question. On identification of this problem, a script was written to correct this problem.

In addition to the problems associated with lack of testing of the online version of the questionnaires, as noted above, some additional problems should be mentioned. Many respondents did not have sufficient skills to independently enter all of the required data and submit their surveys successfully. The online approach is dependent upon the robust nature of individual schools’ Internet connections. If all data were not entered prior to a connection failure, schools lost what they had previously entered on the instrument on which they were currently working. Should this happen a number of times to the one respondent, it would be unlikely that s/he would submit the data. If respondents did not enter a SIN, their completed instrument could not be submitted. (While this represents a frustration, a submitted instrument without a SIN would prevent pair matching and would therefore be less valuable.)

A tabular summary of all data entered was monitored via a “Principals’ Survey Submission List” webpage at http://farrer.riv.csu.edu.au/principal/survey/list_surveys.cgi

. Figure 3 illustrates the effectiveness of the data collection script in monitoring and managing the online data collection process regarding pair matching.

Figure 3 Example of Principal Survey Submission List for Canadian Data

ca0005	TL1 TL2 TL3	PR1 PR2 PR3
ca0006	TL1 TL2 TL3	
ca0007	TL1 TL2	PR1 PR2
ca0008	TL1	
ca0009	TL1 TL2	PR1 PR2 PR3
ca0013	TL1	
ca0014	TL1	PR1
ca0015	TL1 TL2	
ca0017		PR1

ca0020 TL1 TL2 TL3 PR1 PR2 PR3
ca0021 TL1 TL2 PR1 PR2
ca0022 TL1 TL2 TL3 PR1
ca0026 TL1 PR1 PR2 PR3
ca0028 TL1 TL2
ca0029 PR1 PR2 PR3
ca0032 TL1 TL2 TL3
ca0035 TL1 TL2 TL3 PR1 PR2 PR3
ca0036 TL1
ca0037 TL1 TL2 TL3
ca0041 TL1 TL2 PR1 PR2 PR3

This allowed individual country coordinators and the project managers to monitor the percentage of data collected and allowed simple identification of missing instruments and SINS that had not been submitted, e.g., the schools with SINS 'ca0005', 'ca0020' and 'ca0035' have submitted completed all three instruments for both principal and teacher-librarian respondents, whereas the teacher-librarians at schools 'ca0006', 'ca0032' and 'ca0037' have submitted all three instruments while the principals at these schools have failed to submit any instruments. A significant benefit of this is that it facilitated the chasing of outstanding surveys from schools. In the Canadian study, in a province where Freedom of Information and Privacy legislation limits researchers' matching of respondent names with their responses, the Principals' Survey Submission List, was included in the second reminder letter to schools so that schools could check their own submission status. The success of the project hinged, to some extent, on the successful completion of instruments by the both teacher-librarian and principal of each participating school. The involvement of both allows for analysis on paired responses. If only one of the pair returned their data other analysis could be successfully undertaken, but the value of the study would be diminished somewhat.

Notwithstanding the problems noted above, the use of a Web-based approach to data collection has a number of significant advantages and enormous potential for future large international collaborative research projects. Perhaps most importantly, the approach allows the standardization of survey instruments and coding of data across countries. Likewise, all data from the participating countries can be collected on one server.

In addition, data collection methods can be standardized across participating countries which allows data to be imported into the SPSS data analysis program. This is particularly useful because it facilitates standardized data testing and analysis across all countries and allows for simplicity in future comparative data analysis. These commonalities enhance the management of the project and enable ready monitoring of the progress and the timely identification of problems affecting all participating countries or arising from individual countries (if any).

The timeline for data collection time is reduced as respondents enter data directly to the server rather than onto paper and thereby requiring a third party to key in data. When funding is an issue, this is of special benefit. In addition, all data entered via the Web are automatically formatted, ready for importing into a data analysis program.

Respondents were able to complete each of the three survey instruments separately which gave them the flexibility of time to enter as they wished, as against sitting at their PC for a substantial block of time. This approach was evident in a number of cases where subjects submitted half an instrument and then came back later and submitted the remaining data. Using the SIN and instrument tag, data col-

lectors were able to successfully match the two pieces of data. This flexibility in data input may have enhanced the qualitative data entered in the third instrument. This also may help to explain why the Canadian respondents, the majority of whom were responding online, provided the most lengthy and detailed responses to Instrument 3. An example of compiled data as a text file for Principal Instrument 3 can be found at http://farrer.riv.csu.edu.au/principal/PR3_au.txt

The online approach provides advantages to both the respondents and the researchers particularly in a multi-country project where a number of languages were employed. The significant reduction in data entry time and the collection of all data together at a convenient point that enables a range of time savings and enhancements cannot be over valued. Like all cutting edge approaches, however, it did create challenges for those respondents who were not regular online users. Improvements in off-the-shelf software will enable enhancements to the approach to be made. A system could be developed where a questionnaire is typed into a word processor using special markers from which an online questionnaire could be generated. The resulting entered data could be automatically prepared for processing using SPSS. Microsoft Office '99, for example, is expected to use XML for internal processing with 'styles' determining the markup.

Data Entry and Analysis

Each IRRG member was responsible for the collection of data in their country and for the entry of those data via the WWW database at the School of Information Studies, Charles Sturt University (CSU). Where possible, the respondents were asked to enter their responses on an electronic format of the questionnaire, i.e., accessed via the WWW. There was variation in data collection and data entry across the seven countries, and in no country was there 100% electronic data collection and entry. In five of the countries, the data was collected using paper questionnaires. In four of these, the researchers then entered the data onto the CSU website. In non-English speaking countries, this second step also involved translating non-numeric data into English. In one non-English speaking country, this additional step proved too daunting, the data was never entered onto the CSU website, and the data was analyzed by a local research agency. In Canada and Australia, some respondents entered their data directly onto the CSU website while others completed paper questionnaires which were then entered onto the website by the researchers. The Canadian respondents had the highest rate for data entered directly onto the CSU website.

The quantitative data from the CSU website was analyzed using SPSS by Hay and Henri at CSU. Frequency analysis was used to get an overall picture of the data, and t-tests were used to check for significant differences between the responses of principals and teacher-librarians. The qualitative data from the open-ended questions was analyzed using a framework and procedures developed by Oberg at the University of Alberta.

Data Analysis for Instruments 1 and 2

Coding

The data analysis process for the quantitative Instruments 1 and 2 was developed using the Australian data. As each country's data was analyzed a comparative coding masterfile was developed to accommodate the additions or changes made to instruments of individual countries. A coding sheet was developed for coding of the demographic data from Instrument 1 for each country. Variables were created in SPSS for Windows 3.1 beginning with SIN, TL_PR (Teacher-librarian-1 or principal-

2), and Country. Variables for perceptions, both future and present, in Instrument 2 were created for each question, i.e., q1f, q1p, q2f, q2p, and belief questions, i.e., q32b, q33b. The number 999 was entered for missing values section under each variable. Each of these variables were then labeled under the Label sections, so that coding is explained under each variable by double clicking on the variable label in the grid/ data file of the SPSS .sav file. All other settings remained as the default settings. All perception questions in Instrument 2, both present and future, were coded in the following manner: 0 = no comment; 1 = none; 2 = a little; 3 = some; and 4 = a lot. Beliefs were coded in the same manner: 0 = no comment; 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree.

Frequency Analysis

Frequency analysis was carried out on Instrument 1 data to provide useful data for reporting, including quick and tangible figures, and a summary of information of nominal and ordinal scales. An initial frequency analysis was carried out selecting minimum and maximum values to be shown in order to check that all data was entered correctly, and that 999 had been coded as a missing value and would not be included as a valid number, and therefore used in analyses. Any errors to data entry were corrected at this stage. The data file was then split (using the 'split file' command), so that all analyses would be run for teacher-librarians and principals as two separate groups. The File Split function was used under the variable TL_PR.

Valid percentages were used in giving the frequency data. Thus all 999 responses were excluded from the calculations, e.g., if there were 68 respondents and of those ten were missing (999 codes), the percentages were calculated from the 58 respondents who had valid responses for that variable. Percentages were then recorded for the report in order of Teacher-librarian variables, Principal variables and then School variables. Percentages of each response for each variable were recorded, e.g., with gender, it might be that 59% of teacher-librarians were female and 41% were male.

Descriptive Data

Descriptive data (mean and standard deviation) were used to provide a quick summary of the present, future and beliefs data (ordinal data, 2 is more than 1 in value, etc.). Due to the coding and the later use of present, future and belief data in analyses, it was more appropriate to use mean (average response) rather than how many (percentage) for each code, e.g., how many answered "1 - none" to question 1 future, "2 - a little" to question 1 future, and so on. The data was still split at this stage so that teacher-librarian and principal data was analyzed separately. Mean and standard deviation responses were tabulated for each present and future question in one table. TL data was presented first. TL average responses to each question was then presented in written form for present and future. Mean and standard deviation responses for principals were then tabulated in the same format as that for the teacher-librarians. Instead of a complete rundown for principals, a short paragraph summary was given in respect of the teacher-librarians responses.

Belief responses were tabulated and presented for the TL followed by a summary of the beliefs that the teacher-librarians as a group believed were accurate and then those which the TIs believed were not so accurate. Any mean over 3.0 was seen as being in clear agreement with the belief. Any mean below 2.5 was seen as being in clear disagreement with the belief. Belief responses were tabulated and presented for the principal followed by a summary of those responses which differed from those given by the TLs, i.e., if the teacher-librarians had been in agreement with a belief

and the principals in clear disagreement, then this response was presented.

T-tests

T-tests were carried out to compare present versus future perceptions. A general standard of $p < .001$ was set for significance due to the fact that so many t-tests were carried out, thus increasing the chance of making an error (saying a result is a significant difference when it in fact occurs by chance). Setting the significance level so much lower helped prevent this error from being made. Dependent t-tests were run for the present versus future questions. A dependent t-test was used to compare teacher-librarians' responses to two different questions, rather than two different people's responses to the same question. Results were tabulated giving the Mean, Standard Deviation for present and then future and the P value for each question that was significantly different from present time to future time spent. A written summary was then given of the questions that were significant, e.g., "Teacher-librarians believe their principals should be spending more time seeking feedback from staff about their impressions of the quality of the LRC services than they currently do." The same process was carried out for the principals.

Independent T-tests

Independent t-tests were carried out to compare the two different independent variables of TL and PR on each question, i.e., q1f. Independent t-tests were carried out on all present, future, and belief questions and significant results were presented. Again significant results were generally set a $p \leq .001$, but for some countries it was $p < .01$. Results were then tabulated and a written summary given of the results in terms of the present questions that the principal and teacher-librarian differed on, the future questions the principal and teacher-librarian differed on and then the beliefs the principal and teacher-librarian differed on. Tabulated results included the Levenes F value, Levenes P value, T-value, degrees of freedom, p value, TL mean and standard deviation, and Principal mean and standard deviation. Independent t-tests were also carried out on the following variables: number of years in current position, age, gender, number of years in executive positions, number of years teaching prior to current appointment, qualifications, and number of professional association memberships. Significant results of these comparisons between the principals and teacher-librarians were tabulated as per the present, future, belief questions, and a summary was provided.

Global Comparisons

A variable called 'Present' was created by adding up the respondents' answers to each of the 31 present questions, the results of which was recorded under the variable, so the result would be out of 124 (31 x 4). A variable called 'Future' was created by adding up the respondents answers to each of the 31 future questions, the results of which was recorded under the variable, so the results would be out of 124 (31 x 4). A variable called 'Beliefs' was created by adding up the respondents answers to each of the belief questions, the results of which was recorded under the variable. Independent t-tests were carried out for these three variables comparing the principal and teacher-librarian for each one to see if they significantly differed from each other. All results were tabulated and a written summary provided.

Data Analysis for Instrument 3

Responses to the open-ended questions on Instrument 3 were analyzed using a content analysis approach. Content analysis involves a lengthy process of reading and re-reading responses, noting the content of responses, identifying themes or categories from the responses according to the content, and then grouping and re-

grouping the responses within the themes or categories. This interpretive process began with reading all the responses to get an overall sense of the data. Then, each of the open-ended questions was analyzed. For example, the responses of the principals to Question 3 were read and content of each response was noted (that is, the ideas within the response were written down). Themes were identified and the ideas were grouped under the themes. From this, the frequency of ideas could be seen and the dominant themes could be identified. This process was then repeated for the responses of the teacher-librarians to the same question. The NUDIST*QSR software program, designed for use with textual qualitative data, was used to gather together all the responses to each open-ended question from all the principals in each country and all the teacher-librarians in each country. It has also been used to gather together pairs data, that is, the responses of the teacher-librarian and the principal for each school where both principal and teacher-librarian submitted responses to the questionnaires.

At this point, the responses to the open-ended questions by teacher-librarians and by principals in each country have been analyzed. In future, it is anticipated that researchers in some of the countries will want to analyze the responses to Instrument 3 provided by teacher-librarians and principals in the same school (pairs data) to identify possible patterns related to alignment of beliefs, perceptions, and goals for an information literate school.

Reporting the Findings

The project has generated an immense amount of data, and in-depth analysis will take considerable time. By the end of July 1998 the first phase of the statistical analysis of the quantitative data was completed and the data analysis reports were shared with researchers from the participating countries. At that time, as well, the researchers received reports of the qualitative data organized by question number. Each member of the IRRG was responsible for compiling a preliminary report, based on findings from both qualitative and quantitative data analysis, for their own country. The presentation of these reports comprised the agenda for the morning workshop held at IFLA'98 in Amsterdam, The Netherlands—Session 158B for the IFLA Section of School Libraries and Resource Centres on *The Role of the Principal in an Information Literate School Community: An International Research Panel*. The papers from this session are available at <http://www.ifla.org/ifla/IV/ifla64/64cp.htm> and at [<http://farrer.riv.csu.edu.au/principal/survey/>](http://farrer.riv.csu.edu.au/principal/survey/).

Further analysis of the qualitative data was required to explore the forms of support for teacher-librarians offered by principals; the types of actions taken by teacher-librarians to develop principal support; the strategies implemented by principals and teacher-librarians in developing information literate school communities; and the professional development needs of principals and teacher-librarians with respect to developing an information literate school community. Here also the in-depth analysis of the pairs data, that is, the responses of principals and teacher-librarians working together in the same schools, may provide valuable insights into the ways in which they work together and the factors that support and limit their collaborative work. The contribution that this international study to the development of information literate school communities will be seen where data from the individual country studies is analyzed to reveal the patterns of collaborative work between principals and teacher-librarians within each country's unique educational

context and culture.

Analysis of the quantitative data for each country has identified the significant factors related to the role of the principal and the librarian in creating an information literate school community. Cross country comparisons have identified some common concerns, priorities, and beliefs of principals and teacher-librarians across a diverse range of educational contexts. This is where individual countries could learn from each other regarding programs and strategies that effectively support the development of information literacy in schools. The findings from the cross country comparisons will be reported at the Third Annual International Forum on Research in School Librarianship, at the [1999 Joint Conference](#) [add link here] <<http://www.ala.org/aasl/birmingham/index.html>> of AASL and IASL in Birmingham, Alabama.

This project has demonstrated the potential benefits as well as the potential problems in conducting collaborative research in teacher-librarianship on an international scale. It is anticipated that the project will contribute to the development and publication of an international set of guidelines for principals and teacher-librarians in developing effective information services and supporting information literacy programs in schools.

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Appendix

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