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IMPACT OF SCHOOL LIBRARIES ON LEARNING

Critical review of published evidence to inform the Scottish education community.

Professor Dorothy Williams,
Caroline Wavell and Katie Morrison

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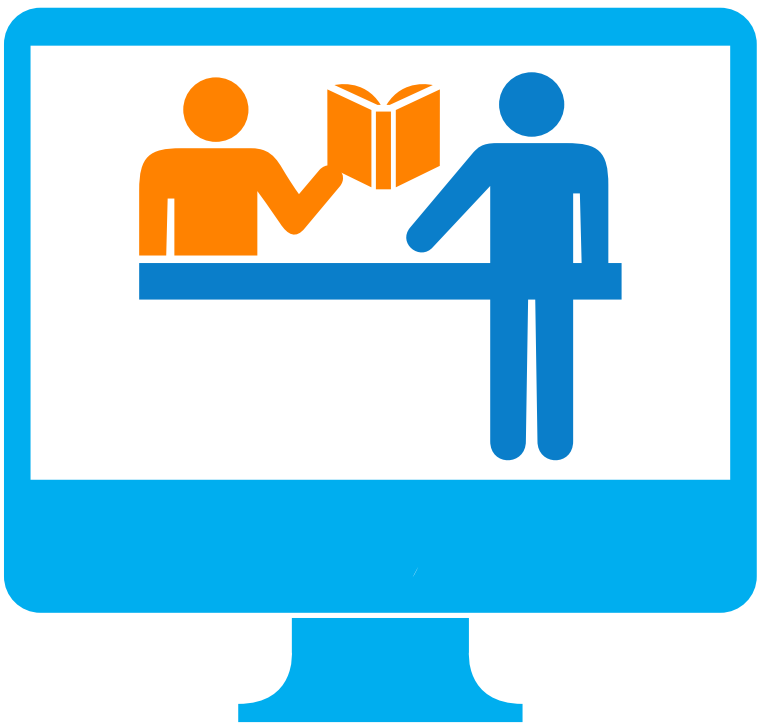
Institute for Management, Governance & Society (IMaGeS)

October 2013



IMPACT OF SCHOOL LIBRARIES ON LEARNING

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to inform the work of the Scottish education community.

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EXECUTIVE SUMMARY

The aim of the report is to identify and critically evaluate the available evidence of the impact of school libraries on learning, including attainment, skills and attitudes. The report, commissioned by the Scottish Library and Information Council (SLIC), is based on a critical review of UK and international evidence published since 2001 linking school libraries to educational achievement, attainment and learning in secondary education. The objectives were to:

- Identify, evaluate and summarise evidence in relation to a number of key questions identified by SLIC;
- Assess the applicability of the findings to the potential of Scottish school libraries to impact on Curriculum for Excellence;
- Identify gaps in the evidence and suggest areas for further research in relation to Scottish school libraries.

The research was designed as an update of the previous review of the impact of school library services undertaken in 2001 by the same team (Williams, Wavell & Coles 2001).

The outcomes will inform SLIC strategies in support of school library provision in Scotland. The outcomes should also be of value to policy and decision makers in local authorities and individual schools in their future planning for school library provision, and to individual school librarians in their own strategic planning. The work was conducted between the months of May to October 2013 and the outcomes presented at the Scottish Learning Festival held in Glasgow in September 2013.

The findings reveal a considerable body of international evidence showing that school libraries impact on:

- **Higher test or exam scores equating to academic attainment**: this includes academic attainment in the form of higher standardised test scores in reading, language arts, history and maths, and better grades in curriculum assignments or exams;
- **Successful curriculum or learning outcomes, including information literacy:** this includes higher quality project work, the development and practice of information literacy, increased knowledge and reading development; and
- **Positive attitudes towards learning**: including increased motivation, improved attitude towards learning tasks, self-esteem, and wider reading for pleasure.

Examination of Curriculum for Excellence documents, including experiences and outcomes for a sample of curriculum subject areas showed links with all three types of learning indicators. Not surprisingly, the closest links were found in cross-curricular Literacy Across Learning, and good links were found between the evidence of impact and the Guiding Principles and Four Capacities for Learning.

In addition, the evidence clearly identifies the elements of the library which contribute to the impact on learning:

- A qualified, full-time librarian, who is proactive and has managerial status;
- The availability of support staff to undertake routine tasks enabling the librarian to initiate instructional, collaborative and promotional activities as well as professional duties to support collection development;
- A library that supports physical and virtual access to resources in the library, classrooms and at home, during school hours and beyond;
- An adequate physical and virtual collection that is current, diverse and supports the curriculum as well as appealing to students' leisure needs;
- Networked technology to support information access and use, and knowledge building and dissemination;
- Instruction that supports individual and curriculum needs of students and teachers, encompassing subject content, information literacy and voluntary reading interests;
- Collaboration with teaching colleagues, senior management, librarian colleagues and outside agencies, including central schools library services, to ensure the most appropriate services are delivered in support of learning.

The majority of the available evidence was found to be from the United States with some significant studies from Australia. Smaller studies at the school level were more widespread. The UK is beginning to lay the foundations for evidence building and a potential source of evidence in the form of shared practice was highlighted. The methodologies used to gather data have been reviewed and their advantages and disadvantages outlined.

The major gaps in evidence and implications for further research were found to be:

- Limited published evidence from Scotland;
- A lack of evidence about the links or impact between school libraries and the community;
- The need for appropriate data to be collected to enable the variety of library contributions to be correlated with national examination results;
- The need to identify a way of collating and systematically reporting the evidence found in shared practice or self-evaluation portfolio documents;
- The need to identify ways in which head teachers can be made aware of how a school library can contribute to student learning and their role in recruiting appropriate staff and supporting their collaborative and instructional activities.

Inspired by the work of Keith Curry Lance, the findings of this review of evidence are summarised graphically below as a quick reference and advocacy tool, showing the difference that a school library can make to the learner.

IMPACT OF SCHOOL LIBRARIES ON LEARNING

SCHOOL

+

FULL-TIME QUALIFIED LIBRARIAN

+

SENIOR MANAGEMENT SUPPORT

+

FUNDING

+

ADDITIONAL LIBRARY STAFF

VIA

LIBRARY COLLECTION & ACCESS
Providing large, high quality, multi-format reading & information collection in library, classroom, beyond school day.
Encouraging library & information use.

LIBRARY NETWORKED TECHNOLOGY
Providing computers with internet & remote access to library catalogue & digital resources.

INSTRUCTION BY LIBRARIAN
Developing critical independent information users & enthusiastic readers.

COLLABORATION BETWEEN LIBRARIAN & TEACHERS
Planning, developing & evaluating instruction with teachers.
Contributing to whole school priorities.
Liaising with external colleagues & agencies.
Supporting teacher professional development.

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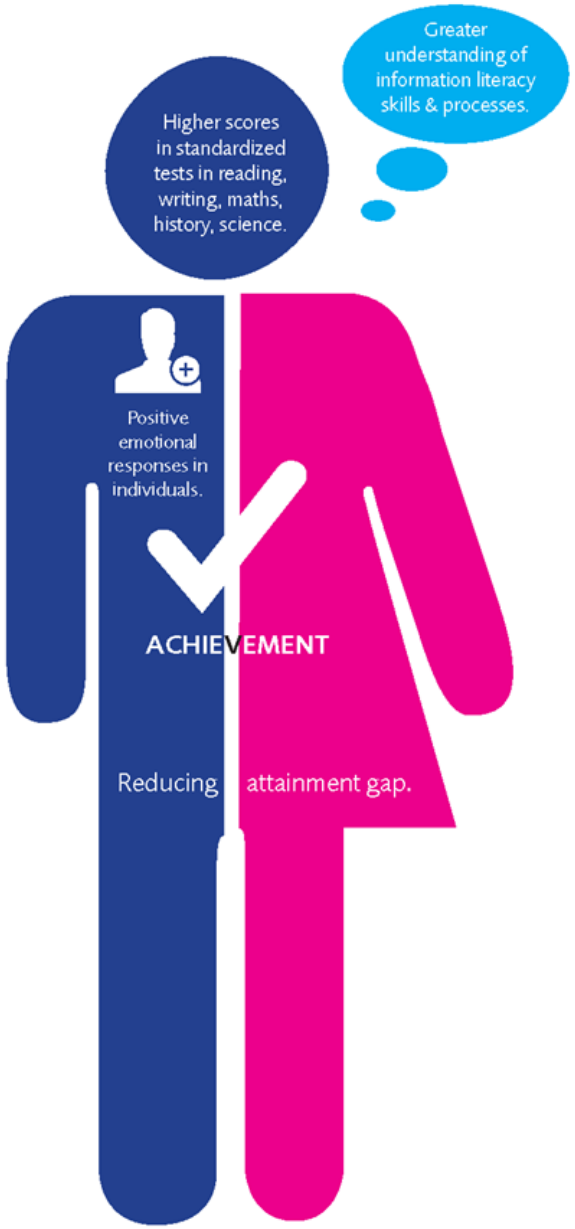

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Impact of the School Library on Learning, a report prepared for SLIC by Robert Gordon University:
http://www.scottishlibraries.org/school-libraries/

SLIC Scottish Library & Information Council

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1 INTRODUCTION

The Scottish Library and Information Council (SLIC) commissioned an overview of available evidence on the impact of school libraries on achievement and learning, with a particular focus on school libraries in secondary education. The research is designed as an update of the previous review of the impact of school library services undertaken in 2001 by the same team (Williams, Wavell and Coles 2001). This updated review examines the evidence published since that earlier 2001 review, and contextualises the findings in relation to current school library provision in Scotland.

The outcomes will inform SLIC strategies in support of school library provision in Scotland. They should also be of value to policy and decision makers in local authorities and individual schools in their future planning for school library provision, and to individual school librarians in their own strategic planning. The preliminary outcomes were presented at the Scottish Learning Festival, Glasgow in September 2013.

1.1 Aims and Objectives

The aim of the research was to identify and critically evaluate the available evidence of the impact of school libraries on learning, in order to:

- Identify, evaluate and summarise evidence in relation to a number of key questions identified by SLIC (see 1.4.1);
- Assess the applicability of the findings to the potential of Scottish school libraries to impact on Curriculum for Excellence;
- Identify gaps in the evidence and suggest areas for further research in relation to Scottish school libraries.

1.2 Background

1.2.1 School Library Provision in Scotland

In Scotland there are a variety of different models of library provision to serve the community and education. All secondary schools have access to library services either through a dedicated school library, a joint school and community library or from a central authority library service. The majority are staffed by professionally qualified librarians who are in an excellent position to support teaching and learning by providing appropriate curriculum related resources, a range of reading material, and helping the school community to develop skills required to be proficient users of information. This particularly high level of professional staffing, compared with other areas of the UK, has enabled school librarians to develop a role that supports the curriculum as well as developing reading literacy.

Since the late 1990s, school libraries in Scotland have been developing close relationships with educational bodies in order to ensure school libraries align themselves with the curriculum and school priorities, for example Taking a Closer Look at the School Library Resource Centre (SLIC 1999), Libraries

Supporting Learners How Good is Our School (SLIC and HMIE 2005), and more recently Developing a School Library Centre Profile (CILIPS 2007) and Improving Libraries for Learners (SLIC 2009). In addition, the profession is supported by CILIPS and The School Library Association (SLA) working to ensure advice, advocacy documents, guidelines and standards are continually updated in line with current government agendas (LA 2000; Barrett and Douglas 2004; SLA 2009 and 2011). These documents provide guidance for librarians working in schools to help them provide the best service through self-evaluation and alignment with their school's curriculum priorities.

All government, local authority and school budgets are under constant and increasing pressure and have a duty to ensure financial resources are directed to areas that have a positive impact on student learning and wellbeing as well as academic achievement. The need for librarians and library service managers to justify their budgets, or even their existence is not new and the widespread introduction of ICT has given the profession different challenges as well as opportunities. This review provides evidence of the emerging factors that will be important in continuing to develop effective school libraries.

1.2.2 School Library's Role in Literacy Development

In response to concerns over poor literacy standards, in 2010 the Scottish Government established the Literacy Action Plan "to raise standards of literacy for all from the early years through to adulthood" (Scottish Government 2010 p.3) and local authorities and the library services within them are striving to set out plans to enable that vision. The Literacy Action Plan document recognises the work of the OECD Programme for International Student Assessment (PISA) and the Scottish Survey of Adult Literacies 2009 in establishing the link between poor socio-economic status and failure to reach basic standards of literacy (ibid. p.5).

Traditionally, a key role for school librarians has been the development of reading. They ensure the collection has leisure reading material and initiate a number of reading promotional activities to raise awareness of books and authors, such as author visits and reading programmes. Thus, school librarians are in a key position to take the Literacy Action Plan forward within their own schools. Whether pleasure reading alone is enough to develop the analytical skills needed to use information in a timely and appropriate way is less clear.

Information Literacy has been prominent internationally in the library and information field since the 1990s and many definitions have been created. In the USA, information literacy was incorporated into the standards for school libraries in 1998 with the publication of Information Power: Building Partnerships for Learning (AASL and AECT 1998) and have been updated with the publication of Standards for the 21st Century Learner (AASL 2007). In the UK, the CILIP's Information Literacy Group website states: "Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner." (CILIP CSG Information Literacy 2013). Technology and its widespread use across education has inspired teaching professionals to find creative ways of using

digital tools to encourage learning, for example the NFER FutureLab's Enquiring Schools programme (NFER 2013). Digital literacy is now viewed by the Scottish Government as an important skill set for the workforce of the future (Scottish Government 2013). Many school librarians have been embracing technology not only to inspire learning but also as an important management tool for cataloguing and delivering information to library users at a point of need. However as a profession, librarians have also been aware of the problems that abundant and easily accessible information poses for many users and view digital literacy as just one, albeit important, aspect of information literacy.

In response to the research and advocacy work done by Irving and Crawford through the Scottish Information Literacy Project between 2004 and 2010 (Irving and Crawford 2013), Education Scotland has taken on board the significance of information literacy and has incorporated it into the Curriculum for Excellence (Education Scotland 2013a).

1.2.3 Curriculum for Excellence

Curriculum for Excellence (CfE) began in 2002 with a national debate and consultation, and schools implemented the new curriculum during the 2010-11 school year (Education Scotland 2013b). The curriculum was designed to provide children and young people with the knowledge, skills and attributes for learning, life and work in a manner that encompasses challenge, engagement and motivation, and encourages the desire for high achievement. It is guided by the principles of challenge and enjoyment, breadth of experiences, progression through the ages three to eighteen, depth of knowledge and understanding, personalisation to encompass individual needs and opportunities to exercise personal choice, coherence of progression and across aspects of learning, and relevance to enable understanding of their learning context and relevance beyond the school environment. The curriculum takes a whole school approach encompassing experiences and outcomes, curriculum areas and subjects, interdisciplinary learning, ethos and life of the school, and opportunities for personal achievement. The purpose of the curriculum encapsulates four capacities: successful learners, confident individuals, responsible citizens, and effective contributors and has three areas across the curriculum seen as the responsibility of all within the school environment: health and wellbeing, literacy and numeracy (Education Scotland 2013c).

This curriculum framework provides opportunities for school librarians to become proactive in providing support across the four capacities and cross-curricular responsibilities, aligning services to the curriculum and individual school priorities:

> "The role of school librarians in the secondary sector cannot be underestimated. Their understanding of different learning styles and collaboration with teaching colleagues enables them to act as a bridge between young people, teachers, information and the curriculum. Their potential contribution towards meeting the National Priorities for Education is therefore considerable." (SLIC and HMIE 2005)

School libraries are now seen, in theory as least, as fully included within the Scottish school curriculum.

1.2.4 Self-evaluation and School Inspection

Self-reflection and evaluation is an important means of identifying strengths and weaknesses either in one's own learning or when interacting with others. Self-evaluation is now part of work practice and for a number of years professional guidance has encouraged self-awareness and enabled school librarians to identify areas of good practice and priorities for improvement within their own libraries (Arthur and Milligan 2007; SLIC 2009; HMIE 2007). The development of self-evaluation portfolios also has the potential to raise awareness of the library and the support it can provide to teaching staff and senior management. This is especially true as school libraries can now expect to be part of the HMIE inspection process.

1.2.5 Previous School Library Impact Research

In recent years there have been worldwide concerns over the financial crisis, interest in educational standards, including literacy development, and the need to measure impact. Researchers in the library and information field throughout the world have been examining the impact of library services on learning and what factors are significant in determining impact. Evidence of impact of school libraries has been accumulating since the early work of Stewart et al. in 1957 and Gaver in 1963 (cited by Farmer 2006). Keith Curry Lance began his studies in the early 1990s and since then researchers have begun adding to this work, the majority being carried out in the USA. These impact studies are constantly being described and discussed on a variety of websites and in reviews, including:

- Links to state studies can be found at the US Library Research Service website: http://www.lrs.org/data-tools/school-libraries/impact-studies/
- Kachel and US Mansfield University students' summaries of impact studies by school library service component at: http://library.mansfield.edu/impact.asp
- And the US Scholastics reviews of 2004 and more recent "School Libraries Work!" 2008, available at: http://listbuilder.scholastic.com/content/stores/LibraryStore/pages/images/SLW3.pdf
- Report of the Californian impact study (Achterman, 2008)
- Lonsdale (2003), and more recently in Hughes and Bozorgian's study (2013, pp. 61-63), the literature was reviewed for the Australia school library community.

As indicated, these reviews are based on the educational environment of the countries in which they are set, namely the USA and Australia. The earlier work by Williams, Wavell and Coles (2001) and Williams, Coles and Wavell (2002) provided the school library profession with a review of impact studies in relation to the educational environment in England at that time. This review considers the available evidence since 2001 and is specifically concerned with relevance to the Scottish educational environment. It is particularly timely given recent concerns over national literacy levels, the rise

in profile of the significance of information literacy, the development of self-evaluation tools, and the recent curriculum changes.

1.3 Methodology

The project took the form of a desktop critical review bringing together the findings from a range of research reports and literature, potentially worldwide, detailing research into school libraries and their relationship with achievement and learning.

The review set out a clearly defined research protocol (see Appendix A) and was undertaken by two researchers who conducted checks at strategic points to minimise discrepancies and bias. The search and selection procedures defined at the start of the review process (Appendices A-E) guided the research, providing clarity and transparency of actions, and ensured the research review was reliable and rigorous in its methodology. This project did have time and resource limitations which could not allow for a full systematic review as set out in the EPPI-Centre Guidelines (2010), whereby the researchers follow strict protocols, and select and code all documents in tandem. The research team were also mindful of the debates regarding the appropriateness of systematic reviews for mixed methods educational research, rather than experimental controlled trials characterised in medical research, and of the rapidly developing different methodologies being used when synthesizing data during meta-analysis (Gough, 2012). Thus, this review adopted recognised good practice wherever possible, was guided by protocols and procedures but not constrained by them, to ensure a rigorous and reliable synthesis of research findings upon which to base informed decision-making.

1.4 Review Strategy

1.4.1 Scope

The scope of the project was defined in discussions with SLIC, drawing on the key questions which guided the previous 2001 review but updated to reflect current interests within a Scottish context. The questions to be addressed are:

- **Attainment and achievement**
  What is the link between school libraries and achievement/attainment in schools?
  What impact do school libraries have on raising pupils' attainment in schools?

- **School libraries and learning in broadest sense** (personal development and confidence)
  Can a link be made between school libraries and enrichment of the curriculum?

What impact do school libraries have on pupils' attitudes to learning (or confidence in learning) and specifically in relation to Curriculum for Excellence capacities?
What research has previously been done on school libraries' impact on whole school provision (i.e. impact on life of school as a whole, including teachers' continuing professional development or CPD) or impact within the community?

The identification of research undertaken on the impact of school libraries on learning is a broad topic when learning is taken in its widest context to include attitudes and enrichment as well as achievement and attainment in the form of progress in learning and test results. In addition to pupils' learning, formal and informal, evidence of any impact of school libraries on teachers' continuing professional learning was of interest, as was any evidence of impact on the wider community recognising that a number of the current Scottish models involve levels of coordination and/or partnership working with other services such as public libraries.

The main focus of the review is on evidence in relation to secondary school libraries but key resources relating to younger and older age groups have been included where they provide findings relevant to secondary education or are part of the significant body of impact studies.

1.4.2 Research Protocol

A written research protocol was developed (Appendix A) with clearly defined search strategies (Appendices B and C) and inclusion criteria (Appendix D). A variety of bibliographic databases were searched using a range of keywords and combinations associated with learning and school libraries. In addition, key journals, institutions and known researchers were searched for by hand as necessary. The identified references were stored in RefWorks, a reference management system. Two researchers conducted and cross-checked sample searches to establish reliability and rigour. The authors, titles and abstracts were checked against stated inclusion criteria to identify reports to be obtained for detailed inspection. In order to minimise the potential for different interpretations of review questions and data, the review team met at regular intervals to consider reports causing specific challenges and to establish patterns in analysis. Each study was described individually and then the findings of all the in-depth reviewed studies was synthesised so that conclusions could be drawn. Structured narrative describing patterns in findings form the basis of the synthesis of findings. Emergent findings were mapped against Curriculum for Excellence, particularly as they relate to Curriculum for Excellence capacities and learning outcomes.

1.4.3 Amendments to the Research Protocol

As already stated, the research was guided but not constrained by protocols and procedures. During progress of the review, minor adaptations and amendments to the initial protocol were adopted in order to cope with a number of emergent issues.

Generally simple search terms were enough to capture relevant references and duplicates soon appeared through the different databases. The most useful databases proved to be Library Literature and Information Science, LISTA, Web of Knowledge, ZETOC and Google Scholar. However, each bibliographic database employed differing search mechanisms and means for downloading citations, making searches cumbersome. Many of the major study reports did not appear through the databases: these were identified through articles written about them, which required individual searches, initially through known sources, though the problem of broken links on websites sometimes necessitated extensive additional searching. The search log worked for online databases producing lists of results but proved too time-consuming when hand-searching. Hand-searching became an important part of the study and required greater emphasis than initially expected. Given the time and resource constraints, the decision was made to prioritise recording of bibliographic details and content summaries, and the analysis and synthesis of identified studies, over strict adherence to detailing search histories.

1.4.4 Presentation of Findings

This report provides details of the research process, findings, conclusions and implications. Research identified for inclusion in the review is mapped against the sub-questions itemised in the Scope section above. The findings are also set out as a descriptive analysis of individual reports and synthesis of literature to summarise the key points, particularly in relation to the applicability to school libraries in Scotland. Gaps identified during the search process are highlighted along with implications for further research and possible action.

The findings were also briefly outlined in a presentation at Scottish Learning Festival in Glasgow, on 26 September 2013, shared with speakers outlining the Literacy Action Plan in libraries. For that purpose and for other wider dissemination a summary presentation of key findings has been developed with graphics to enhance delivery of key messages to audiences outwith the school library community.

1.4.5 Collaborative Interpretation of Findings

Both the mapping against the Curriculum for Excellence and the development of presentation materials for Scottish Learning Festival was undertaken with input from a small working group set up by SLIC. The working group met with the research team on three occasions prior to the Scottish Learning Festival to discuss emergent findings and relationships to Curriculum for Excellence, and to design outputs to summarise key findings for professional audiences and policy-makers.

2 REVIEW OF THE LITERATURE

2.1 Approach

This critical review was planned as an update of the previous 2001 review (Williams, Wavell and Coles 2001), thus the search covered the years from 2002 to 2013. References that were covered in the previous review have not been reviewed in this research project. The search focus was on published, peer reviewed articles and reports, although some non-peer reviewed documents have been included where they are considered significant to the overall aims of the study.

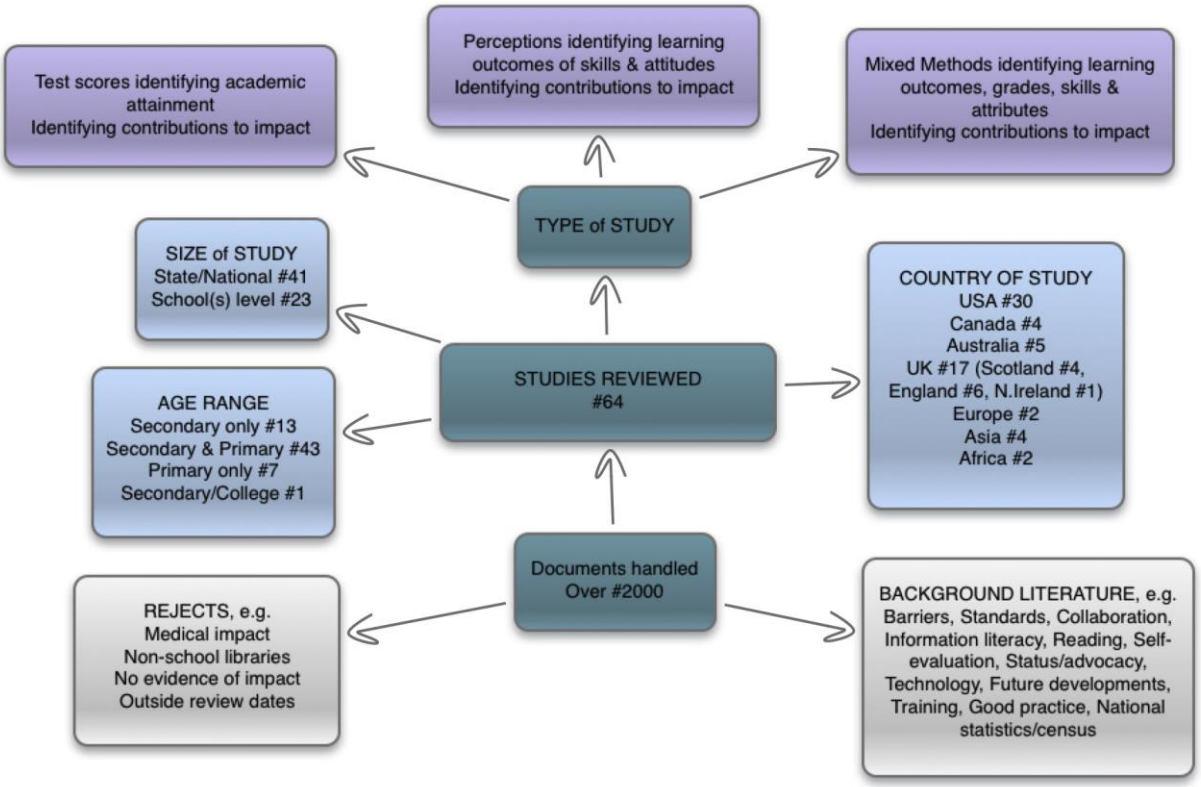
While different countries use different terminology for school libraries and school librarians (for example, media centres, media or technology specialists, certified or endorsed librarians, and teacher-librarians), the term 'school library' and 'school librarian' will be used in this report, unless directly referring to a report where different terms have been used. The term school librarian will apply to those individuals who have been trained at degree level or higher and are qualified to manage a school library in terms of collection management, reading promotion and information literacy instruction activities. In addition, each US state has different acronyms for their standardised tests, and sometimes test at differing ages or in different subjects. All this adds to the complexity of unpicking the details of the large-scale studies identified.

2.2 Review Mapping

After initial sorting and removal of duplicates, 800 citations remained in the RefWorks file, and were placed in folders according to the database located. Authors, titles and abstracts, where available, were scrutinized according to the inclusion/exclusion criteria and references were placed in folders as rejects, those useful for background information, and those requiring further scrutiny. The majority of the latter group were downloaded and five were found to be unavailable for review (Lance, Rodney and Hamilton 2002; Sinclair-Tarr and Tarr 2004; Jesseman 2006; Lance and Russell 2007; Bivans 2008).

Figure 2 below illustrates the selection and synthesis of documents identified during the review. It provides a brief overview of the 64 studies selected and examined in-depth and three broad types of study identified with some overlap between them.

Figure 1: Mapping of the Review Documents



2.3 Findings

2.3.1 Research Scope and Links to Curriculum for Excellence

The visual map of studies gives a brief overview of the different types of research studies identified during this review. Although the studies broadly fall into categories defined by the indicators of learning identified, it is difficult to make comparisons as they take different approaches. Sometimes different approaches are determined by data availability, while at other times differing research questions direct the research approach and these latter studies are generally building upon the research base already available.

The research questions identified by SLIC and detailed in the research strategy can be broken down to five broad areas of focus, the impact of school libraries on:

1. Attainment and achievement, which are indicators of learning;
2. Broader learning encompassing attitudes to learning, which are indicators of learning;
3. Enrichment of the curriculum, which is a contributor to learning and an output of library activity;

4. CPD, which is a contributor to learning and an output of library activity; and
5. Impact on the wider community, which is a contributor to learning and an output of library activity.

In turn, the first three of these can be related to the Curriculum for Excellence as stated in "*What is curriculum for excellence*" introduction on the Education Scotland website (Education Scotland 2013 c). The following words and phrases form part of that introduction detailing the capacities or guiding principles (discussed section 2.1): successful learners (focus 1), confident individuals (focus 2), responsible citizens (focus 3), effective contributors (focus 2), knowledge (focus 1), understanding (focus 1), skills (focus 1), attributes for learning (focus 2), challenge (focus 3), engagement (focus 2), motivation (focus 2), and desire for high achievement (focus 2), personalisation to encompass individual needs and opportunities to exercise personal choice (focus 3), coherence (focus 3), progression (focus 1 and 3), understanding of learning context (focus 1), and relevance beyond the school environment (focus 1 and 3). These areas of focus are considered again in section 2.3.5 in summarising the evidence emerging.

2.3.2 Types of Impact Studies Reviewed

The studies examined in this review used a variety of quantitative and qualitative research methods determined by the type of evidence sought from the study. Those studies using correlation and factor analysis sought to identify whether the school library has a positive impact on standardised test scores and when a positive correlation was found, further analysis was used to establish which library elements have the most significant impact. Other studies used questionnaires, interviews or focus groups to seek the perceptions of a variety of stakeholders on the impact they understood the school library to make on student learning. This type of study identified a range of perceived impacts including achievement in learning outcomes, the development of competencies and broader learning association with attitudes to learning.

Studies examining student attainment from test scores

There is a substantial body of large-scale studies that use correlation and factor analysis to isolate specific school library elements that contribute to student academic achievement as represented by state test scores while controlling for socio-economic factors. The first major study of this type was undertaken by Keith Curry Lance and his colleagues, in the US State of Colorado, in 1993 and discussed in the previous impact review (Williams, Wavell and Coles 2001). While Lance continues to be a key researcher in this field, other researchers have used this model in the USA, Canada and Australia. Although these studies use state-wide data, the useable data or actual respondents vary considerably from thousands of schools in the sample (Achterman 2008; Dow 2012; Lance and Schwarz 2012; Quality Resources 2003) to hundreds of participating schools (Queen's University 2006; Smith 2006; Rodney, Lance and Hamilton-Pennell 2002; Rodney, Lance and Hamilton-Pennell 2005; Roberson, Schweinle and Applin 2004), to smaller

population samples within states (Baxter and Smalley 2004; Eye 2003; Farmer 2006; Hughes and Bozorgian 2013).

The test scores used are those taken by students in various year groups and cover a variety of academic subjects, including reading and language arts (for example vocabulary, grammar, comprehension and writing), maths, history and science, and are published at state level. Each study uses slightly different data sets, for example one study may use reading scores at one specific age group, while another may examine several age groups and several different test scores.

A prerequisite for these large-scale studies is a census of the current state of school libraries in the target area and level of school library provision, in order to conduct analysis between different library service elements. Sometimes this has been done routinely at specified periods at a state level and the data is made available for the subsequent analysis and decision-making. At other times a preliminary survey is conducted as the first phase of a study. The test score data are correlated with census data of school library inputs and output activities, generally following published national or state standards for school libraries, for example, Information Power: Building Partnerships in Learning (AASL and AECT 1998) and Standards for the 21st Century Learner (AASL 2007). Types of library elements examined are:

- Number of staff, number of staffing hours,
- Hours of operation, both during school and outwith school hours,
- Library staff qualifications, whether licensed, endorsed, certified, graduate, etc.,
- Budget or spending, typically per capita or per 100 students,
- Collection size, number of fiction and non-fiction books, periodicals, dvds, and videos,
- Average copyright dates to establish currency and quality of collection,
- Circulation numbers, often broken down under collection categories,
- Networked library catalogue,
- Numbers of computers and numbers with internet access,
- Provision of curriculum integrated information literacy instruction,
- Amount of time spent on variety of library activities (and sometimes non-library activities, such as bus, playground duties):
    - Resource recommendation, planning, implementing and evaluating student learning with teachers,
    - Assisting students,
    - Collection development (selecting, processing, shelving),
    - Conducting workshops for teachers,
    - School committee collaboration,
    - Liaising with the principal,
    - Interlibrary loan provision,
    - Reading promotion, and
    - Technology related activities.

In order to isolate the extent of impact of library services on test scores by library services, the study data are analysed against other school, community or socio-economic factors. These factors typically include:

- Numbers or percentage of students receiving free or reduced school lunches used as an indicator of low income,

- Parental education,
- Ethnicity,
- English language learners,
- Average teacher salary, and
- Teacher qualification.

Over the years the body of research has developed and researchers have built on findings from previous studies to refine further study. The more recent studies have begun to examine certain aspects of library provision in more depth or to look more closely as some of the socio-economic factors. Lance and colleagues have begun to examine library input trends over time against test scores (Lance and Hofschire 2001; Lance and Hofschire 2012). Several studies examine the achievement gap in more detail, sometimes concentrating analysis between high and low achieving schools, schools with high or low quality library provision, or examining at risk groups in more detail (Francis, Lance and Lietzau 2010; Lance and Schwarz 2012; Rodney, Lance and Hamilton-Pennell 2002). The support of the principal or school administrators has been identified as an important indicator of quality library provision (Hartzell 2002) and studies have begun reporting on such support (Achterman 2008; Lance, Rodney and Schwarz 2010). The third phase of the Pennsylvania study sought principals' perceptions of their school libraries and the perceived impact on student learning (Lance and Schwarz 2012) and how the responses relate to test scores. The role of librarians in helping to educate teachers was reported in (Hughes and Bozorgian 2013; Rodney, Lance and Hamilton-Pennell, 2003; Lance and Schwarz 2012) and the impact of summer reading programmes was specifically highlighted in the Missouri study (Quality Resources, et al. 2003).

In addition to these large-scale studies, the review identified a number of studies using school or local tests on small population samples, either in a single school or across a few schools. Although the value of these studies is greatest in informing local stakeholders, they do add to the growing body of evidence that school libraries do indeed have a positive correlation with academic success represented by higher test results. Examples of such studies tend to be set in a wide variety of countries, including Australia, Canada, Hong Kong, Indonesia, Northern Ireland, Netherlands, Nigeria, Norway, and USA.

Studies examining perceptions of achievement or broader learning

Another major study type assumes a quality library makes an impact on student learning, based on the evidence from Lance style studies, and seeks perceptions of the nature of that learning impact from the various school library users and stakeholders. Again, these are large-scale, state-wide studies developed by Ross J. Todd and Carol C. Kuhlthau in the Ohio study (Todd and Kuhlthau 2005b & c) and replicated in Delaware (Todd and Heinstrom 2006), and Queensland and Victoria, Australia (Hay 2005 and 2006). These studies use a questionnaire of 48 "help" statements with an additional critical incident question, to capture additional evidence of impact, which is administered to students, teachers, principals and school librarians. The statements were grouped into seven blocks broadly categorised as: finding information, using information, help with computers, knowledge,

reading and independent learning. The criteria used to identify "effective" school libraries are carefully selected in consultation with research advisory groups and generally follow national or state standards for school libraries, for example, Information Power (AASL and AECT 1998) and Standards for the 21st Century Learner (AASL 2007).

Mixed methods and small-scale studies examining a range of learning impacts

Small, Snyder and Parker (2009) used a mixed quantitative and qualitative approach to establish impact on test scores and differences in perceptions of the school library's impact on a variety of broad learning indicators. In New Jersey, Todd, Gordon and Lu (2011) used focus groups and in-depth analysis of "stories" to build up a picture of the type of learning school libraries are understood to help develop.

A number of much smaller scale studies, sometimes at the local school level, were identified during this review project. Individual school library studies are often done as part of librarian professional development, through self-evaluation of practice and services, or sharing of practice. Observational evidence of impact presented by librarians themselves, school inspectors or visiting researchers is less easily quantifiable and very often focuses on the affective or broader aspects of learning not captured through testing and help to substantiate user perceptions. The evidence cited tends to be in the form of vignettes describing particular library projects or events, sometimes with limited details of actual impact. A few examples of school library activities that are perceived to impact learning have been highlighted and published in reports or online by inspection or educational bodies in the UK (HMIe or Ofsted, Education Scotland), through school library professional services (The School Librarian, local authorities, The Heart of the School website), or researchers in the school library field (Irving and Crawford). Examples of anecdotal evidence of this kind were not actively pursued as they fell outside the remit of peer-reviewed published work, although some found during searches have been included to illustrate the potential for this sort of evidence. Indeed, school library self-evaluation portfolios developed locally and used during school inspections to assess quality of teaching and learning can be viewed as a legitimate and important source of evidence.

Advantages and disadvantages of the various types of study

The different methodologies used for identifying impact of the school library on learning all have advantages and disadvantages and tend to identify different types of learning. Table 1 below provides a summary of this:

Table 1: Summary of Advantages and Disadvantages of Types of Impact Study

Summary of study types			
Type of Study	**Type of Evidence**	**Advantages**	**Limitations**
Large-scale state/national studies based on test scores	Attainment characterized by higher test scores or exam results.	Scale & diversity of sample. Replicable & scale adding weight to findings.	Test scores or exam results examine limited learning.
Large-scale state / national studies using stakeholder surveys	Based on perceptions of increased skills, knowledge and understanding. Affective learning such as attitudes.	Replicable & scale carrying weight to findings. Diverse learning experiences identified.	Self-reporting of limited statements with potential for bias. Selected sample.
Large-scale state / national studies using mixed qualitative & quantitative methods	Perceived, observed or measured impact on quality of learning outcome products, study practices, attitudes to learning.	Variety enables depth of investigation of learning.	Potential for bias. Certain elements replicable though local adaptation needed to ensure maximum value.
Smaller school studies	Based on quality of outcome products. Perception of attitudes to learning.	Useful for additional evidence building.	Too small to allow comparisons or transfer to other situations.
Shared practice descriptions / self-evaluation profiles	Based on self- or teacher-reported perceptions & observations of behaviour, quality of outcome products, attitudes to learning.	Enables service and outcome development at a local level.	Difficult to assess impact at a wider authority or national level.
Inspection reports / Recognition Awards	Based on independent observation, scrutiny of profiles & using questioning. Identifies learning outcomes and attitudes to learning.	Independent. Identifies both good and poor practice.	Inspections follow strict protocols, which may not allow for recognition of other aspects of learning. Only selective elements considered.

2.3.3 The Evidence of School Libraries Impacting Learning

The school library impact studies reviewed for this project identified types of learning that can be grouped under three main categories of learning indicators. In turn, these indicators are recognisable components of school

learning in general, including the Curriculum for Excellence. These indicators of learning are:

- Higher test or exam scores, equating to academic attainment;
- Successful curriculum or learning outcomes, including the development and practice of information literacy; and
- Evidence of positive attitudes towards learning.

Each of these types of learning indicators are important for overall success both during school careers and beyond, and the authors of this review and those of the impact studies recognise the limitations of studying any one learning outcome. As already suggested above, each of the different methods of data collection for impact studies lends itself to particular types of indicators of student learning, although by no means exclusive. Each of these indicators of learning will be summarised in more detail below.

Increased Test Scores

The major evidence for increased test scores as a result of library interaction comes from the large-scale statistical analysis of the correlation between state standardised test results and different school library inputs and outputs. The 21 studies detailed here come from 15 US states (Colorado and California having two studies each), two Canadian provinces and two Australian states. In addition, there are three US and one British study, which are country-wide. In an online interview between Lance and Callison in 2005, Lance states that the Colorado study model has involved "approximately 8,700 schools with enrollments totaling [sic] more than 2.6 million students" (Lance and Callison 2005). All these studies use the state standardised test scores in reading to establish correlations and the following are just a few examples of the findings:

- In Colorado in 2011, "schools with at least one FTE endorsed librarian averaged significantly higher advanced CSAP reading scores (8% vs. 6%) and significantly lower unsatisfactory scores (9% vs. 11%) than schools with less than one FTE endorsed librarian*."* (Lance and Hofschire 2012 p.5)
- Students in Minnesota "taking the reading tests in grades 5, 7, 8, and 10 scored between 3 and 6 points higher on those tests in schools with higher media center expenditures." (Baxter and Smalley 2004 p.37).
- In Illinois, "Higher library staffing levels are linked to higher reading performance for elementary, middle, and high schools (increases of almost 13 percent, over eight percent, and more than seven percent, respectively)." (Lance, Rodney and Hamilton-Pennell 2005 p.iii).
- "This study's comparison of MEAP reading performance for Michigan schools with and without librarians indicates that the presence of a qualified school librarian can make a tremendous difference in the reading achievement of a school's students. This difference ranges from eight percent for high schools to 35 percent for elementary schools." (Rodney, Lance and Hamilton-Pennell 2003 p.ix).

While the reports do not specify what the standardised reading test cover, they are understood to cover reading comprehension of texts of increasing complexity. In Missouri, the school library summer reading programme was found to have strong significant impact on reading scores (Quality Resources

et al. 2003), while in Canada (Bouchamma et al. 2013) and the UK (Clark 2010) correlations were found between the amount of fiction, informative texts and books provided by the school library and reading attainment. Rodney, Lance and Hamilton-Pennell (2002) reported evidence of improved reading especially for Hispanic students and this is important when combined with other evidence relating to staffing and test scores in supporting the fact that school libraries have a significant contribution to make to reducing the achievement gap.

In addition to reading tests, some studies analyse the test scores of language arts, which cover writing abilities, and other subjects such as maths, social sciences and science. Examples of the findings from other subjects are summarised below:

- Achterman found particularly strong correlations between Californian state test scores and library media specialist staffing in both English Language Arts and U.S. History at grade 11 and the correlations were reported to be stronger than any other study reviewed in his research. (Achterman 2008 p.117).
- A longitudinal study of staffing levels in Kansas revealed that schools with a full-time library media specialist (LMS) tended to outperform those with no LMS regardless of their poverty levels in reading, maths, science, history and writing (Dow 2012 p.11).
- In Wisconsin, "library media program variables explained a small but very significant portion of the variance in WKCE performance…At the high school level, they explained 7.9 percent of the WKCE reading variance and an even higher percent, 19.0 percent, of the WKCE language arts variance. At the high school level the impact of a robust library media program was almost 7 percentage points greater than the impact of the socio-economic variables." (Smith 2006 p.9)
- The Pennsylvania study reported a stronger correlation between higher library staffing levels and Advanced Writing scores than for Advanced Reading scores at elementary and high school grade level (2% vs. 3% and 8% vs. 13% respectively) while at middle school level the correlation was similar at 4% (Lance and Schwarz 2012 pp. 14 and 16).

Assessing the impact of the school library on science and maths test scores appears from the Pennsylvania and Missouri studies to be more problematic. In Pennsylvania, the researchers sought perceptions of impact from administrators, teachers and librarians in surveys (Lance and Schwarz 2012) and in Missouri, the researchers aggregated tests scores into an overall reading and non-reading weighted average MAP index as both were highly correlated in terms of student achievement (Quality Resources, et al. 2003 p.25). However, the international PISA studies (Twist et al. 2012) and national British Cohort study (Sullivan and Brown 2013) report students who have access to quality reading material tend to have higher attainment in all subjects.

Aanu (2011) reporting on a small-scale Nigerian study, found a positive relationship between students' study habits, use of the library and science achievement. Mardis used the 2002 eighth-grade Michigan Educational

Assessment Program (MEAP) science test scores and found the only significant positive correlation with library factors was the size of the video collection. As a practising librarian she recognised this as the major use of the library by the science department and goes on to consider the difficulties of building relationships between librarians and science departments (Mardis 2007). In a shared practice article, Edwards reports on introduction of iPods in the school library for revision for the English national GCSE examinations. While not specifically mentioning subjects or making undue claims for the impact, Edwards did report a significant increase of students attaining five or more A*-C grades in their exam results, from 59% to 77%, in the year of introduction and this success has enabled further development of the initiative (Edwards 2011). These studies support other research on the importance of having up-to-date collections relevant to the curriculum. Smalley (2004) took a different approach by examining the importance of school librarians in California in instructing information literacy to enable students to make successful use of college libraries. The study identified college students who had previously attended schools from one district with school librarians and two districts without, and then examined the scores given for a college library course. At a mid course check, 57% of students from district with school librarians scored in top third, in the other two districts the figures were 25% and 15%. For scores in the lowest third the scores were 15% with librarian, 38% and 45% for those without librarians. At this point the 506 students had time to practice and review their skills over the period of the course and at the final check 66% of students with librarians earned A grade. This compares with 43% and 37% scoring grade A in the two groups from districts without librarians. Again evidence that a school librarian contributes not only to higher course grades but also to information literacy practices that are important for further education.

Several studies have examined the relationship between declining school library provision and student achievement. The Queen's University report on surveys of Ontario schools shows that over the previous five years there had been a steady decline in the percentage of elementary age students who report that they like to read and at the same time, there has been a steady decline in the percentage of elementary schools with teacher-librarians (Queen's University 2006). Lance and Hofschire analysed data from across the USA and found the "schools that either maintained or gained an endorsed librarian between 2005 and 2011 tended to have more students scoring advanced in reading in 2011 and to have increased their performance more since 2005 (45% and 49%, respectively) than schools that either lost their librarians or never had one (33% and 29%)." (Lance and Hofschire 2012 p.3). They identified similar results in the 4th Colorado study (Lance and Hofschire 2012).

In the light of evidence from previous large-scale impact studies, some researchers have turned their attention specifically to at-risk groups of students in order to establish whether the presence of school libraries have the potential to reduce the attainment gap. In the 3rd Colorado study strong links were reported between full-time endorsed librarians and higher percentages of students with proficient or advanced reading scores and also a lower percentage receiving unsatisfactory scores (Francis, Lance and Lietzau 2010). In Pennsylvania, Lance and Schwarz (2012) state that there were

stronger associations between library services and the economically disadvantaged (black, Hispanic students and those with disabilities). Baxter and Smalley (2004) report that staffing levels are lower in schools where 50% or more students receive free or reduced-price lunch. Nelson (2009) reported that in California higher performing schools provided a higher percentage of library services and resources for both Latino and white students. While not reporting improved test scores, the evaluators of a library grant programme directed specifically at schools in low-income areas did find that the funding had established new or expanded existing library programmes which involved more collaboration between librarians and faculty staff and increased library usage and suggested the lack of impact may have been due to the timing of the evaluation (Michie and Chaney 2009). Qualified school librarians, collaboration between librarians and teaching staff, and quality library programmes are all elements associated with quality library provision which have been linked to higher test scores (for example, Rodney, Lance and Hamilton-Pennell 2002 and 2003; Lance, Rodney and Hamilton-Pennell 2005 and 2009). The contributing factors will be discussed in more detail in the following sections.

Curriculum or Learning Outcomes and the Development and Practice of Information Literacy

A variety of more qualitative methodologies have been used to capture evidence of learning outcomes as perceived by administrators, teaching staff and students and observed by researchers themselves (see Table 3).

In Ohio, Todd and Kuhlthau (2005b & c) developed a Likert scaled "help" survey with an additional open critical incident question. This "help" model was adopted in Delaware (Todd and Heinstrom 2006) and in Australia (Hay 2005). The three studies using this model had large numbers of valid responses: Ohio had 13,123 student and 870 faculty responses from 39 selected elementary and high schools; Delaware had 5,733 student responses from 13 selected elementary and high schools and Australia had 6,718 responses from 46 selected primary, secondary and senior schools; giving a total of 25,574 valid student responses. The 48 "help" statements were presented in seven blocks and examples of these statements are included below:

- Block 1 How helpful the school library is with getting information you need.
    - The school library has helped me find different opinions about my topics.
- Block 2 How helpful the school library is with using the information to complete your school work.
    - The school library has helped me put ideas in my own words.
- Block 3 How helpful the school library is with your school work in general.
    - The school library has helped me change my mind about some things I thought I knew.
- Block 4 How helpful the school library is with using computers in the library, at school, and at home.

    - The school library has helped me be more careful about information I find on the Internet.
- Block 5 How helpful the school library is to you with your general reading interests.
    - The school library has helped me enjoy reading more.
- Block 6 How helpful the school library is to you when you are not at school
    - Things I've learned in the school library help me study at home.
- Block 7 Now, some general things (Academic Achievement)
    - The school library has helped me get better grades on my projects and assignments. (Todd and Kuhlthau 2004 p.6)

The responses to the statements provide evidence that a quality school library is perceived to help students in a variety of learning situations, and provide the means for incidents of learning not covered in the ranked statements. In Ohio, 99.44% of the sample indicated that the school library had helped in some way and similarly high percentages were received from the other two studies. While the questionnaire used the term 'school library', the critical incident responses revealed the importance of the librarian. Table 2 below gives an idea of how the seven blocks were ranked in terms of positive impact by students and faculty in Delaware and Ohio (Todd and Heinstrom 2006; Todd and Kulthau 2004). Hay (2005 and 2006) reported findings similar to these in Australia although differences in presenting findings prevented inclusion in this table.

Table 2: Ranking of Delaware and Ohio Blocks of Help Statements

Level of impact	Group			
	Delaware		Ohio	
	Students	Faculty	Students	Faculty
Highest	Block 4 COMPUTERS	Block 4 COMPUTERS	Block 1 GETTING INFORMATION	Block 4 COMPUTERS
	Block 1 GETTING INFORMATION	Block 1 GETTING INFORMATION	Block 4 COMPUTERS	Block 1 GETTING INFORMATION
⬇⬇⬇	Block 2 USING INFORMATION	Block 5 READING	Block 2 USING INFORMATION	Block 2 USING INFORMATION
	Block 3 KNOWLEDGE	Block 2 USING INFORMATION	Block 3 KNOWLEDGE	Block 5 READING
	Block 5 READING	Block 3 KNOWLEDGE	Block 7 ACHIEVEMENT	Block 7 ACHIEVEMENT
	Block 7 ACHIEVEMENT	Block 7 ACHIEVEMENT	Block 5 READING	Block 3 KNOWLEDGE
Lowest	Block 6 INDEPENDENT LEARNING	Block 6 INDEPENDENT LEARNING	Block 6 INDEPENDENT LEARNING	Block 6 INDEPENDENT LEARNING

It is perhaps not surprising that the 'finding information' and 'computer' blocks were found to be most significant, especially when compared with how

the library makes a difference reported in the statistical studies in the section below. However, the order of some of the questions is more revealing. Ohio students ranked the following statements as being areas where the library was "most helpful":

- Q43: Computers have helped me find information inside and outside of the school library (49.01%)
- Q41: Computers in the school library have helped me do my school work better (41.58%)
- Q46: Computer programs (like PowerPoint, Word, and Excel) in the school library have helped me do my school work (39.67%)

When the statements were ranked according to whether they perceived a level of help, regardless of how much (most, quite, some, a little), the following statements are ranked highest:

- Q11: The school library has helped me know the different steps in finding and using information (96.84%)
- Q12: The information in the school library has helped me work out the questions for the topics I am working on (95.95%)
- Q13: The school library has helped me find different sources of information (such as books, magazines, CDs, websites, videos). (95.10%)

These statements corresponded to Hay's findings from Australia although the order in Hay's study was Q12, Q11, Q13 (Hay 2005). A small project in Uganda also identified nine conceptions of 'help' reflecting Todd and Kuhlthau's work, including: saving time doing school work, enabling completion on time, providing a study environment, helping take the stress out of learning, helping to do work more efficiently, thinking about the world around them, knowing strengths and weaknesses in information use, enabling ideas investigation in a safe environment and helping in set goals (Dent 2006).

In a three-phase study in New York, Small and colleagues contributed to the evidence that school libraries raise language arts test scores in 4th grade students (Small, Snyder and Parker 2009). In addition, the study sought the perceptions of administrators' support for the school library and compared these with school librarians' perceptions. The researchers used a survey to identify the impact of school library programmes, services and resources on achievement, motivation, support for disabilities, and the influence of library technology use (ibid. 2009). Phase II (Small and Snyder 2009) sought perceptions of teachers, students and school library media specialists in order to identify the ways in which school librarians' actions and behaviours impact learning and motivation. The seven areas of focus were: information literacy (subdivided into finding, using and evaluating information); technology use; respect for diversity; collaboration; professional development; services to students with disabilities; and students' perceptions of the library's learning climate. Small and Snyder (2009) report that in their findings all groups of participants placed greater emphasis on the impact of the school library on developing the skills of finding information than the skills of using or evaluating information. As in the Ohio model, a critical incident item provided useful additional evidence of impact. The responses most frequently identified types of input focusing on information literacy and technology use, for example:

- "I had to do a research paper last year and my librarian helped me find all the information I needed to get my report done. I thought it went well and I found new interesting books in the library."
- "The school librarian taught me how to use the virtual library, and it has come in handy ever since for various assignments, mostly in English."
- "One time my school librarian really helped me was in after school when she showed all the students this typing program that helps us learn how to type and I'm a lot faster then [sic.] I was when I started and I don't even have to look at the keyboard any more."
- "Usually when I visit the library, my librarian tells me about new books coming out that will interest me. This gets me to read and coming to the library more." (Small and Snyder 2009 pp. 17-18)

The critical incident responses in Hay's study (2006 p.29) reported evidence of impact under the following 'helps':

- Help completing assignments, projects, research and homework tasks
- Help with finding/locating resources/information, print, non-print, digital
- Comments on access to and availability of library facilities, opening times etc
- Help in getting a good grade or better marks for schoolwork
- Help with exam preparation and study
- Help with learning/improving reading skills and selecting reading material
- Reference to library providing students with social experiences
- Helping with using information, e.g. taking notes, bibliographies, writing in own words
- Helping students organise themselves and time to complete assignments/project work
- Help with defining project topics
- Help with learning, greater understanding, knowledge construction
- Affective support, eg. motivational help, feeling comfortable and confident
- Student comments about the library as a positive learning environment

Teacher and librarian anecdotes in the Iowa impact study describe activities rather than learning outcomes. The only learning impact reported was from a former student describing how a library reading initiative had got him hooked on reading (Rodney, Lance and Hamilton-Pennell 2002) (see list of learning outcomes below). While Todd and Heinstrom (undated p.42-3) indicated that responses to the critical incident question revealed difficulties in identifying library-related learning outcomes, they nevertheless were able to identify outcomes relating to:

- mastery of research processes, and research skills involved in locating and selecting sources, organizing, and evaluating information, and compiling information (61 responses);
- improved reading skills, more interest in reading (58 responses);
- mastery of information technology skills - internet, online catalog, databases, searching UDLib, learning in new presentation formats (34 responses);

- change in attitude, interest, and motivation- positive attitude to visit library, increase interest, engagement in library activities (24 responses); and
- learning of specific curriculum content (7 responses).

In another large-scale study in New Jersey undertaken in 2009, the researchers, amongst other things, sought to add to the evidence of how students benefit from school libraries and provision of best and promising practices in school librarianship. The two-phase study began with a survey of school library infrastructure and personnel providing the status of school libraries in New Jersey and collected 765 valid responses (Todd, Gordon and Lu 2010). The responses to this survey are briefly discussed in Section 2.4.4 describing the ways in which school libraries contribute to learning. Phase 2 of the study examined the dynamics of a selected sample of 14 school libraries through focus groups with students and faculty to establish perceptions of student learning, including the means by which learning was facilitated and evidence used to described learning, and faculty attitudes to school library use. The core learning capabilities developed by the school libraries identified in the New Jersey research included:

- Resource-based capabilities
- Knowledge-based capabilities
- Reading-to-learn capabilities
- Thinking-based capabilities
- Learning management capabilities
- Personal and interpersonal capabilities (Todd, Gordon and Lu 2011 pp. 30-1)

Todd, Gordon and Lu (2010) describe these contributions of the school library as:

- "Helping students meet core curriculum content standards;
- Developing a wide range of information handling competencies;
- Providing students with the intellectual and technical scaffolds they need to learn and to be ethical and productive users and consumers of information;
- Nurturing and supporting students as readers by contributing to the reading and literacy agenda of schools." (ibid. p.11)

Actual examples of learning outcomes reported in different studies, included:

- "They are mastering the use of the on line data bases and reliable sources." (Todd, Gordon and Lu 2010 p.7)
- "The 4th grade students created an electronic portfolio to meet the state technology benchmark standards." (ibid. p.7)
- "Students demonstrate research organization, integration of new knowledge, properly crediting sources." (ibid. p7)
- "I guess I could say that if I hadn't read the first book two years ago I probably would not be reading to this day. Before the school's reading days I cannot recollect anytime that I had chosen to read a book on my own or for the fun of it." (Rodney, Lance and Hamilton-Pennell 2002 p.2)
- "I was doing a project on the assassination of President John F. Kennedy, and the librarian helped me pick out useful books and I didn't

realize there were some [sic.] many different takes on him." (Todd and Kuhlthau 2005a p.10)
- "When I couldn't find a cool book that I would be interested in, the librarian helped me find a science fiction book. I now read a lot more science fiction and my mommy is proud! (She gets into this reading thing)." (ibid. p.11)
- "One time I was having trouble learning my elements. The library introduced me to a program that allowed me to learn the elements and their different ions. I was able to get a high grade on the test." (ibid. p.11)

In a report describing examples of good practice in promoting creativity and innovation in compulsory education in European countries, the authors identify an annual cross-curricular activity co-ordinated and resourced by a Scottish school librarian (Banaji, Perrotta and Cranmer 2010 pp. 51-2). While there are many inputs into the activity from a variety of teachers and community links, the study identified that students showed skills in taking on board critiquing, evaluating and debating, which many of the students had never been exposed to previously and improved their knowledge of current affairs and civic consciousness.

Positive Attitudes to Learning

The discussion in the previous section examining evidence of impact on curriculum and learning outcomes, illustrates the inter-relationship between the type of indicators of learning identified and the type of methodologies used to capture that evidence. There are several instances whereby broader affective learning is reported, particularly from critical incident reflections.

Below are some of the examples from critical incident responses illustrating broader, affective learning, reflecting attitudes to learning, motivation, enthusiasm, self-esteem, confidence and interpersonal relationships:

- "Students in some cases have achieved a calmer and more efficient attitude to their specific skills. They have found new interests to increase motivation in other areas." (Todd, Gordon and Lu 2010 p.7)
- "The students' attitudes towards research and literacy have improved this year. What they viewed as frustrating and insurmountable is now viewed as a "do-able" project." (ibid. p7)
- "I needed to find a just right book for me but I just couldn't decide. The help that (our librarian) had given me was that she had gone through many of books that she had thought was just right for me and when she gave me a book that she thought was just right for me I had loved it, it was the greatest book that I had read all year." (Small and Snyder 2009 p.18)
- "They didn't want to stop when our time was up, so I shared what we had been doing with their teacher, and he signed out the book and continued their creations with them." (ibid. p.14)
- "My girlfriend was in a bit of trouble with her parents, so we came into the library and researched about the issue and found ways she could talk to them without them yelling at her." (Todd and Kuhlthau 2005a p.12)

- "Because of the school library, I was able to research the African Hindu Tribes of my native country. This proved extremely helpful in my search for self-acceptance. I have searched many months through books of all sorts never stumbling upon anything remotely near what I needed. Even the tour I took to the museum and the Epcot center couldn't clearly explain in full detail what it felt like to be a true African. I would have never felt in place without this necessary information. The school library is a wonderful thing to have access to." (ibid.)

A number of the 'help' statements used in Ohio, Delaware and Australia indicate the school library's contribution to positive attitudes to learning. While the ranking of these questions may not be amongst the highest, they are still identified as being of some help by a significant percentage of students. Examples from the Ohio study are given below, with their ranking within the 48 statements:

- Q27 The school library has helped me know that research takes a lot of work. (12/48)
- Q17 The school library has helped me feel good about asking for assistance when I go there. (14/48)
- Q16 The school library has helped me feel better about finding information (15/48)
- Q28 The information I have found in the school library has helped me become more interested in my topics. (18/48) (Todd and Kuhlthau 2004 p.7)

Evidence of school librarians' role in pastoral care was the unexpected outcome of a study examining the status of school library provision in England. The survey included a critical incident item and resulted in the identification of a number of school librarian activities which were perceived to have a positive impact on the personal development of students, including social inclusion, self-esteem, engagement and appropriate behaviour (Shaper and Streatfield 2012). As well as identifying learning outcomes in the form of skills, knowledge and understanding, the case study in the Scottish cross-curricular project co-ordinated by the school librarian (described in the learning outcomes section above), included indicators of broader learning outcomes (Banaji, Perrotta and Cranmer 2010). These included evidence of resilience and enhanced students' enjoyment and motivation in their learning (ibid. p.54). This study also illustrates just one example of how the school library and librarian contribute to enrichment of the curriculum.

Another case study reviewed, investigated the impact of the school library on pupils' personal development in a Northern Ireland secondary school in a disadvantaged area of Belfast (Fodale and Bates 2011). Responses from school staff indicated that they perceived the school library as having a positive impact on pupils' motivation to learn, on their self-esteem and personal confidence during both formal and informal interaction with the library. A parental survey indicated that they felt the school library contributed positively to pupils' attitudes towards reading and the development of literacy skills. The findings of the pilot phase of an on-going study in the UK, suggested that a positive correlation could be traced between good library provision and positive pupil engagement with reading and information skills (Gildersleeves 2012). However, the author echoed Todd

and Heinstrom's findings in the Delaware study that teachers and pupils had difficulty in articulating outcomes and the particular contributions made by the school library or librarian. Other studies examining reading motivation include a Canadian survey of 13 year olds (Bouchamma, et al. 2013; Huysmans, et al. 2013) an evaluation of a reading initiative in Netherlands, and Clark's study of reading attitudes in the UK (Clark 2010). Four school library initiatives published in a UK practitioner journal also reported increased motivation in reading as a direct result of the school library input (Goy 2009; Hopson 2013; Smith 2010; Wright 2012).

In an area of poverty and unemployment in Scotland, a whole school initiative led by the school librarian resulted in a co-ordinated and consistent adoption and integration of a variety of transferable skills, including information literacy development, across all subject areas (McCracken 2010). This provided anecdotal evidence that as a result more students were finding employment on leaving schools and that employers appreciated the attributes developed through this Future Skills curriculum Attitudes to learning are the subject of a study in Pakistan where teachers perceived the library as an important element in the development of academic attitude and encouraging lifelong learning (Shah and Farooq 2009).

Table 3 summarises the range of studies reviewed in relation to impact of the school library on learning and how they have been grouped. However, it is recognised that these groupings are not exclusive and several studies could be placed in two or more categories. The table illustrates the spread of evidence with the majority of the large-scale studies being undertaken in the USA, Canada and Australia. However, in recent years there is evidence emerging from UK studies, although they tend to be smaller in scale than the US studies, which are building the groundwork for larger studies (Streatfield, Shaper and Rae-Scott 2010; Gildersleaves 2012). The school-based studies identified here are just an illustration of what is potentially a valuable source of evidence.

Table 3: Summary of Studies, Learning Indicators and Study Methodologies

Learning Indicators	**64 Studies found to have positive impact on learning** (Arranged according to indicators of learning. Studies from UK in ***bold***)	
Increased test scores	State-wide/national studies 1. Achterman 2008 California 2. Baumbach 2003 Florida 3. Baxter & Smalley 2004 Minnesota 4. Burgin, Bracy & Brown 2003 N Carolina 5. Dow, McMahon-Lakin & Court 2012 Kansas 6. Eye 2003 Utah 7. Farmer 2006 S California 8. Francis, Lance & Lietzau 2010 3rd Colorado primary 9. Lance & Hofschire 2012 4th Colorado staffing levels 10. Lance, Rodney & Schwarz 2010 Idaho 11. Lance, Rodney & Hamilton-Pennell 2005 Illinois 12. Lance & Schwarz 2012 Pennsylvania 13. Quality Services, et.al. 2003 Missouri 14. Roberson, Schweinle & Applin 2004 Mississippi 15. Rodney, Lance & Hamilton-Pennell 2002 Iowa 16. Rodney, Lance & Hamilton-Pennell 2003 Michigan 17. Smith 2006 Wisconsin	18. Queen's University 2006 Ontario Canada 19. Haycock 2011 British Columbia Canada 20. Hughes & Bozorgian 2013 Gold Coast Australia 21. Softlink 2012 Australia 22. Krashen, Lee & McQuillan 2010 all US states PIRLS 23. Lance & Hofschire 2011 all US state 24. Michie & Chaney 2009 all US states 25. ***Sullivan*** *and Brown* 2013 UK 26. ***Twist*** et al. 2012 England PIRLS School or local studies: 27. Aanu 2011 Nigeria 28. Chu, et.al. 2011 Hong Kong 29. Diem 2012 Indonesia 30. ***Edwards*** 2011 England 31. Gillespie 2006 Australia 32. Mardis 2007 US 33. Nelson 2009 US 34. Smalley 2004 US 35. Tonne & Phil 2009 Norway
Accomplish learning outcomes Development & practice IL	State-wide/national studies 36. Hay 2005-6 Australia 37. Todd & Heinstrom 2006 Delaware 38. Todd & Kuhlthau 2004-5 Ohio 39. Todd, Gordon & Lu 2011-12 New Jersey 40. Klinger et.al. 2009 Canada 41. Small, Snyder & Parker 2009 New York 42. ***North Lanarkshire*** undated Scotland 43. ***Ofsted*** 2006 UK	School or local studies: 44. Dent 2006 Uganda 45. Poscopella 2005 USA 46. Ullah 2008 Pakistan 47. ***Herring*** 2009 England 48. Herring 2011 Australia 49. ***McCracken*** 2010 Scotland
Positive attitudes to learning, including reading	State-wide/national studies 50. Arnone, Reynolds & Marshall 2009 USA 51. Bouchamma, et.al. 2013 Canada 52. ***Clark*** 2010 England 53. ***Gildersleeves*** 2012 UK 54. Huysmans, et.al. 2013 Netherlands 55. ***Ofsted*** 2011 England 56. ***Shaper*** & Streatfield 2012 UK	School or local studies: 57. ***Banajl***, Perrotta& Cranmer 2010Scotland 58. ***Fodale*** & Bates 2011 N. Ireland 59. Shah & Farooq 2009 Pakistan 60. ***Goy*** 2009 England 61. ***Ofsted*** & Hopson 2013 England 62. ***Smith*** 2010 UK 63. ***Wright*** 2012 Scotland 64. New York Life Foundation 2006 US

A more detailed overview of each study is provided in Appendix F.

Studies Examining Reading Development

The studies reviewed in this section specifically relate to reading and were not all strictly within the scope of this project as the focus in many cases was not on the impact of school libraries. As such they are not all included in the above table of 64 impact studies. However, they do represent a growing body of research linking the development of reading with attainment and achievement not only in English related tests but also across wider subject areas, as well as influencing broader learning and future employment. The

evidence from these studies is included here, given the strong link between school libraries and the development of reading and literacy.

A recent study in the UK for the National Literacy Trust (Clark and Poulton 2011) surveyed 18,141 young people about their attitudes towards reading, writing and communication skills, and technology use. The study found that those young people who owned books were more likely to express a positive attitude to reading, both in terms of enjoyment and reading more fiction, visiting bookshops and libraries. Krashen (2004), researching in the USA, continues to advocate for free voluntary reading as an important aspect of literacy development and the relationship between voluntary reading and school libraries. The relationship between reading enjoyment, reading proficiency and academic achievement is supported by other international studies.

In 1997 the Organisation for Economic Co-operation and Development (OECD) launched the Programme for International Student Assessment (PISA), which tests the skills and knowledge of 15-year-old students in over 70 countries worldwide, using unique tests unrelated to school curricula. The results provide a comprehensive statistical analysis of relative academic attainment in reading, mathematics and science every three years. In 2009 the focus of the PISA assessment was on reading, and the tests were designed to assess student's ability to access and retrieve, reflect and evaluate, integrate and interpret continuous and non-continuous texts, important elements of information literacy. The findings have consistently reported a correlation between reading attitudes and habits and academic success in all the test subject areas, including maths and science. The results are available for individual participating countries to use for further research and policy making. The Scottish government has published a report examining Scotland's results which indicate that engagement with reading was lower in Scotland than the OECD average in 2009 (Cooke and Bejtka 2010 p.15). Similar results have been reported in England (DFE 2011; Bradshaw et al. 2010) where a significant number of students indicated that they only read when they have to, do not enjoy reading and find it difficult to finish a book. The English reports also indicate reading preferences and trends and reported a lack of library use.

A similar large-scale international study is the Progress in International Reading Literacy Study (PIRLS 2011), which compares reading attainment and attitudes to reading at the 9-10 year old age group in over 49 countries. The results of the 2011 English PIRLS study reports on secondary aged students and provide interesting addition insight into reading attainment and habits (Twist et al. 2012). The report also states that: "Internationally, pupils attending schools with well-resourced school libraries had higher attainment than those with few library books or no school library at all." (ibid. p.65). However, there is also contradictory evidence that countries with the highest average reading performance reported the lowest levels of motivation to read (ibid. p.3) and the authors admit that the complexity of the data hinders comparisons across countries.

The longitudinal British Cohort Studies provides periodic but comprehensive data on a wide variety of aspects of life of the cohort members, such as

physical and mental health, family circumstances, parenting, education, and employment. The comparison of data from different studies and across time provides a picture of social and personal change and provides opportunities to investigate the reasons for such changes. A 1970 British cohort study (Sullivan and Brown 2013) found that reading ability is the best indicator of academic success in schools and that positive attitude towards reading is a good indicator of reading ability. Those children who read for pleasure made more progress in maths, vocabulary and spelling between the ages of 10 and 16 than those who rarely read. The study also indicates that going to the library regularly and reading newspapers at 16 was four times greater than the advantage of higher parental education. In interview Dr Sullivan also suggests that new technologies such as e-readers offer new opportunities to read books and newspapers and urges the governmental support for reading (Sullivan 2013).

The evidence in 2.3.3 is significant in establishing that school libraries can and do have a positive impact on learning but equally important is the impact of different school library inputs and outputs that contribute to learning as well as the support required to enable the most effective contributions. The ways in which a school library makes a difference is the subject of the following section.

2.3.4 How the School Library Contributes to Student Learning

The majority of studies reviewed addressed not just the question of *whether* the library impacts on learning but also sought to identify the elements or factors of the school library provision that are most significant in contributing to student learning. This is important to enable limited resources to be directed to the areas of greatest impact. The studies themselves and the researchers undertaking this review recognise the complexity of the evidence and the problems of using the evidence for effective decision-making. However, there are a number of library inputs and outputs that consistently show a correlation with indicators of learning.

Staffing

The most consistent school factor emerging from the studies reviewed is the significance of school library staffing in raising test scores, enabling the accomplishment of learning outcomes, and providing the personal qualities that encourage a vibrant but safe learning environment. The studies using correlation analysis vary in the degree to which it is the number of qualified librarian hours or the number of total staffing hours that contribute most significantly. A full-time, qualified school librarian is trained to manage a library collection efficiently and is likely to engage in more library related learning activities with both students and teaching staff which are also found to have positive correlations with higher test scores. However, without the support of additional full- or part-time staff the day-to-day routine library management duties detract from these learning related activities. In Idaho it was reported that where teachers experience librarians as instructional colleagues and technology integrators, and where administrators value strong library programmes, students are more likely to excel (Lance, Rodney and Schwarz 2010). These are activities that are less likely to occur with

unqualified staff (Lance, Rodney and Schwarz 2010). The studies surveying library user perceptions and, in particular, the critical incident evidence revealed the importance library users placed on the librarians themselves (for example Todd and Kuhlthau 2005; Shaper and Streatfield 2012; Hughes and Bozorgian 2013). The 4th Colorado study found that schools maintaining or gaining a qualified school librarian between 2005 and 2011 tended to have more students with advance reading scores (45% and 49% respectively) than those without or losing a school library (33% and 29% respectively) (Lance and Hofschire 2012). They also reported significantly lower unsatisfactory reading scores. This endorsed a previous study conducted by the same researchers across states in the USA (Lance and Hofschire 2011) and was similar to findings in Kansas (Dow, Larkin and Court 2012). While in North Carolina, researchers found that higher performing schools had a third as many staff hours as did those in low performing schools (Burgin, Bracy and Brown 2003). In addition, studies revealed that the rise in test scores with a qualified school librarian is not explained away by other school or community factors (Rodney, Lance and Hamilton-Pennell 2002 and 2003; Quality Resources, et al. 2003; Dow, Larkin and Court 2012).

Funding

The size of the school library budget or the expenditure on various library collection elements is another significant measure found to correlate significantly with higher test scores in a number of studies (for example, Francis, Lance and Lietzau 2010; Burgin, Bracy and Brown 2003; Lance, Rodney and Hamilton-Pennell 2005; Quality Resources, et al. 2003; Roberson, Schweinle and Applin 2004; Rodney, Lance and Hamilton-Pennell 2003; Smith 2006 and Softlink 2012). Higher funding ensures not only sufficient staffing levels and an appropriate leisure and study environment, but also a collection that is relevant for the changing curricular requirements, is up-to-date, and sufficiently varied to be able to cater for different learner needs. In turn, the quality and quantity of resources are also significant elements identified as having a positive impact on learning (see below).

Head Teacher Support

Faculty attitudes to school libraries is the subject of qualitative data collected in the Pennsylvania (Lance and Schwarz 2012), Idaho (Lance, Rodney and Schwarz 2010) and Gold Coast (Hughes and Bozorgian 2013) studies, as well as New Jersey (Todd and Gordon and Lu 2010 and 2011), and Ontario (Klinger et al. 2009). However, other statistical studies also included time spent communicating with senior management in their analyses as part of total service outputs or part of overall library standards examined (Achterman 2008; Farmer 2006). All these studies identified a positive relationship between support from administrators or principals and student learning. The studies that examine administrators', teachers' and librarians' perceptions of the role the school library plays in supporting learning reveal some differences in opinions between the groups. However, there are also instances whereby when a librarian reports more learning related activities, other members of faculty rate the library as having a greater influence on student learning (Lance and Schwarz 2012; Lance, Rodney and Schwarz 2010). New York principals perceive librarians as being given greater work automony than

librarians perceive themselves to be given by their principals (Small, Snyder and Parker 2009), which highlights the need for good communication links between the school librarian and their senior management. In England the report on 2004-2005 school inspections also recognised the significance of the school librarian as being regarded as a middle manager. Faculty attitudes towards the school library is an important factor in determining the extent of funding available, support for collaboration between teachers and librarians, the amount a school librarian is involved in curriculum meetings and whole school priority discussions. Without this involvement the school librarian works in isolation and cannot provide the most effective support for learning.

A qualified school librarian with additional support staff and an adequate budget backed by a head teacher who actively values the librarian and library activities enables the other library factors found to be significant in raising test scores and achieving curriculum outcomes, including a current and varied collection meeting user needs, and time to instruct students and liaise with other members of staff as well as librarian colleagues.

Collection and Technology

The majority of studies identified the collection or particular parts of the collection as having a significant contribution to higher test scores and student achievement. The collection is variously described as fiction and non-fiction books, magazines and newspapers in print format, visual resources such as videos and DVDs, and electronic resources, such as library catalogue and subscription databases, e-books and journals, and subject-related digital resource links. The electronic resources require computers in the library with Internet connection as well as networked resources to enable accessible information at the point of need in classrooms and for home use. In order to ensure the collection is large and varied, current and relevant requires a budget that allows for continual collection development. With increasing demands for digital resources, so the funding shifts away from print resources to subscriptions to online periodical and book databases and to the e-book readers, iPods and related devices that support them. In shared practice articles, Wright (2012), Edwards (2011) and Smith (2010) reported on successful initiatives with handheld devices whereby students were inspired to read and revise in a way that suited their needs. However, the next step is to develop such initiatives further to engage more students. Edwards (2011) reported extending the revision licences to enable the notes to be networked for all students in school and at home. In the Pennsylvania study, Lance and Schwarz (2012) examined the estimated state-wide costs of school library infrastructure to enable greater use of online subscription databases. Small, Snyder and Parker (2008) reported on a survey of New York librarians, teachers and focus groups and interviews. The findings revealed a significant positive relationship between a library media specialist and the selection of materials for library collection that represent different points of view, and the selection of materials that support the school's curriculum. In addition the library media specialist plays a role in supporting and guiding students in their use of digital resources, using information in a variety of media formats and by providing students with access to the library catalogue from home. While studies reported a positive correlation between collections and test scores, the actual collection elements found to be significant varied with

different year groups and subjects. In North Carolina, newer books, more spent on print materials, and access to electronic information was found to be significant across the grades (Burgin, Bracy and Brown 2003). Whereas in Florida, the link between collections and elementary schools reading scores was strongest with more book resources, at middle school videos and CD-ROMs were more significant and at high school level the collection required larger book collections, more subscriptions to periodicals and more interlibrary loan (Baumbach, et al. 2003). Bouchamma (2013) and Clark (2010) examined reading preferences and reading attainment, which highlights the need for school library collections to meet the reading interests of a wide variety of users.

Physical and Virtual Access

In addition to the size and quality of the school library collection, it is important that resources are easily accessible and available at the point of need. Flexible scheduling, as opposed to fixed scheduling, was found to be a significant contributor to student attainment in the previous impact review (Williams, Wavell and Cole 2001) and remains so in this review. Flexible scheduling allows individuals and classes to access the library and collections without prior arrangement. While this might cause some logistical problems, the ability to access information at the point of need is important for timely completion of information related projects and assignments. However, with the increase in networked computers and digital resources, the nature of that flexible scheduling has changed to more flexible access, which encompasses the ability of individuals and classes to access resources from the classroom or at home. In addition, flexible access is closely related to library opening hours and this is also a significant contributor to student achievement. In its turn, opening hours and remote access are closely related to the levels of both qualified librarians and support staff to enable development and maintenance of digital collections, to enable enough staff to accommodate differing needs of users while in the library and to enable the school library to remain open throughout the school day and beyond. The physical and virtual availability of the library and its resources also have implications for library usage in terms of visits and resource use statistics. Burgin, Bracy and Brown (2003) reported correlations with test scores and hours of opening in North Carolina; Farmer (2006) cited physical access to facilities as significant in Southern California; in the 3rd Colorado study numbers of visits were significant (Francis, Lance and Lietzau 2010); flexible access and number of visits is cited in the Illinois study (Lance, Rodney and Hamilton-Pennell 2005); Missouri student test scores correlated with library usage and access (Quality Resources, et al. 2003) and again in Mississippi (Roberson, Schweinle and Applin 2004) and in Wisconsin (Smith 2006).

The research indicates that a large and high quality school library collection is a significant contributor to student attainment and achievement and that physical and virtual access to the library and its resources throughout and beyond the school day have an impact on test scores. The availability of resources, however, is not always enough to ensure students' effective reading development and information literacy practices. Positive interaction with library collections is greatly enhanced with timely support and mediation.

This is where the instructional and collaborative roles of the school librarian are important.

Instruction and Collaboration

Instruction and collaboration can take many forms. While the Information Power and 21st Century Learner Standards outline what is expected from a quality school library, some of the studies reviewed also provide additional insights, for example, the census survey instruments provide evidence of the infrastructure inputs of school libraries as well as the activity outputs which are potential contributors to the development of learning outcomes (Burgin, Bracy and Brown 2003; Smith 2006). The researchers of the Michigan study provide a figure of school library predictors of the state reading scores at different school levels, these activities include:

- Planning with teachers
- Teaching with teacher
- Teaching information literacy
- Providing in-service training to teachers
- Reading motivation
- Collection development
- Managing computer networks
- Library meetings (Rodney, Lance and Hamilton-Pennell 2003 p.xiii)

Although all these activities were found to have a positive correlation with test scores none correlated at all three school levels. Achterman (2008) in the California study found that staffing levels and qualified staffing had a significant correlation with higher test scores at all grades and increased with grade. The researcher went on the find significant correlations between staffing levels and total service outputs (resource provision, resource instruction, proactive communication with principals) but individual services vary with different grades. Farmer (2006) found that collaborative planning and instruction was one of the five underlying factors that help Wisconsin student achievement. The studies in Illinois, Idaho, Mississippi, Michigan and Australia's Gold Coast also identified collaboration or instruction as a contributor to learning, with the Idaho study providing some anecdotal evidence:

> "The skills my students learn from our librarian has enabled them to succeed in their research for the National History Day competition. They win regularly at the regional level, many times at the State level and every few years they make it to Washington D.C. to present their projects and research" (Lance, Rodney and Schwarz 2010 p.x).

While one of the respondents in the New York study reported on another incident of collaboration resulting in student success:

> "Our librarian, Claudine, was of immense help. In September of this year, she sat down with me and helped plan out a unit on environmental issues. Because of Claudine, my students were able to use video cameras and movie maker to make short films of how the environment around them is impacted by issues like global warming and introduced species." (Small and Snyder 2009 p.15)

In addition, the researchers in Idaho found that where librarians teach not only students but also their teaching colleagues, where teachers value

librarians as instructional colleagues and technology integrators and where administrators value strong library services and view them as contributing to student success then higher grades were more likely to occur (Lance, Rodney and Schwarz 2010).

In their New Jersey study, Todd, Gordon and Lu describe the evidence school librarians provided on the instructional and collaborative contributions of the school library as:

- "Helping students meet core curriculum content standards;
- Developing a wide range of information handling competencies;
- Providing students with the intellectual and technical scaffolds they need to learn and to be ethical and productive users and consumers of information;
- Nurturing and supporting students as readers by contributing to the reading and literacy agenda of schools." (Todd, Gordon and Lu 2010 p.11)

These researchers go on to describe the frequency of interactions with other members of staff as: co-operations, the most frequent type, co-ordinations and instructional collaborations, the latter being least frequently undertaken. When instructional collaborations did occur they typically took place in language arts, social studies and science subjects. This survey revealed that 63% of participants were involved in the provision of information literacy and 72.8% provided information technology professional development for teaching colleagues. A high percentage, 96.1%, met with their school principle during the school year and just over half met more than five times a year.

Phase 1 of the New Jersey study reveals in detail how school librarians rank the importance of a variety of information literacy instructional initiatives and based on 721 qualitative responses, the researchers identify six key contributions school librarians make to learning outcomes:

- Contribution to development of curriculum standards, including mastery of content standards and contribution to test score achievement
- The development of resource-based competencies, centering on library operations, mastery of a diverse range of information literacy competencies
- The development of research process and learning management competencies, centering on the mastery of explicit aspects of the research process, inquiry processes, strategies of independent learning, and research project management
- The development of thinking-based competencies, in particular the processes of thinking, analysis and synthesis that create knowledge and the representation of knowledge though a range of products
- The development of affective, personal and interpersonal competencies, including the development of positive and ethical values in relation to the use of information, increased motivation and interest for engaging with information for learning and working effectively with others in research activities
- Outcomes related to the development of reading, including increased interest in reading increased participation in reading, the development

of wider reading interests, becoming more discriminating readers (ibid. p.20)

In Scotland, a school librarian reports on the process of collaborating with colleagues to develop a whole school information literacy programme (called Future Skills) which not only became embedded across all subject areas but was seen to be owned by all the staff as a result of effective collaboration. The result was greater understanding of a range of skills by students and anecdotal evidence of improved employment prospects upon leaving school (McCracken 2010). This study and the studies examining information literacy by Herring (2009 and 2011) illustrate the importance and difficulties of embedding information literacy into the curriculum in order to ensure students transfer their skills across a variety of information related contexts.

School Librarian Attributes

One of the key factors contributing to the impact on student learning is the qualified school librarian and the professional activities undertaken. However, some of the critical incident or observation findings reveal evidence of the personal qualities exhibited by school librarians that help to raise the quality of the services provided. In 2006 Ofsted reported on school inspection visits during 2004-5 and summarised the library factors, which contributed to making an impact on learning. These factors are similar to those described in this review: when a school librarian is well trained and a specialist with part-time support staff enabling librarian to conduct development work; is regarded as middle manager; encouraged to work closely with other members of staff; contributes to meeting the school's priorities for improvement; shows initiative in promoting the library; enthusing pupils about reading; analyzes data well and uses a wide range of additional evidence to evaluate the impact of their library; had put in place a systematic programme for teaching information skills. (Ofsted 2006 p.17). What is also revealed are some of the qualities needed: initiative, enthusiasm, analytical skills.

Arnone, Reynolds and Marshall (2009), in a large-scale study involving 1272 8th grade students in 20 states, suggest that how competent the school librarian is perceived is an important contributor to students' own self-confidence, information literacy and knowledge building.

In the New Jersey report the authors also describes the qualities of an effective school librarian emerging from the focus groups, including:

- "Being resilient;
- Being non-judgemental with students and teachers;
- Building an atmosphere of open communication;
- Being willing to go the extra mile to be supportive of teaching and learning;
- Actively building a profile of the school library as an active learning center;
- Having high visibility as teachers and works to sustain this as a priority;
- Being sociable and accessible, inclusive and welcoming;
- Loving to learn and being a lifelong learner who wants to share knowledge and expertise;

- Having a strong ”help” orientation, i.e. this is about learning, not the library!
- Focusing not so much on their libraries, but on their commitment to enabling multiple learning needs to be met;
- Being solution-oriented;
- Creating the ethos of the library that is an invitation to learning, a place to be, do and become;
- Having high expectations for colleagues and for students;
- Liking and caring about young people and having flexibility in creating a learning environment that appeals to them;
- Being leaders and instructional innovators who are not afraid to take risks, be creative, and do what best serves learners of all ages.”

(Todd, Gordon, Lu 2011 p. 29)

Some of the smaller shared practice vignettes reveal librarians who seek new and innovative ways to motivate students (Banaji, Perrotta and Cranmer 2010; Edwards 2011; Ofsted 2011b; Wright 2012. These types of librarian-initiated activities are not unusual and are indicative of how the school library enriches the curriculum and widens the experiences students can experience.

2.3.5 Summary of Findings

The previous sections have provided illustrations of the type of student learning found to be positively linked to the school library and those aspects of the school library that contribute most to that learning. There were 64 individual studies identified for review, some of which provided extensive evidence of impact and the factors contributing to that impact, while others contributed to the growing body of evidence and illustrated alternative ways in which the impact of school libraries on student learning has been sought.

The evidence of actual learning impacts has been summarised under three headings:

- improved test scores,
- accomplishment of learning outcomes, and
- positive attitudinal learning.

While these groups are interrelated and interdependent, they provide a useful means of summarising how learning can be identified and the ways in which it might be sought. There is also evidence that the school library is a powerful resource in lowering the achievement gap between advantaged and disadvantaged students.

SLIC identified key questions (see section 1.4.1) which were adapted into five broad areas of focus:

- Attainment and achievement, which are indicators of learning;
- Broader learning encompassing attitudes to learning, which are indicators of learning;
- Enrichment of the curriculum, which is a contributor to learning and an output of library activity;
- CPD, which is a contributor to learning and an output of library activity;
- Impact on the wider community, which is a contributor to learning and an output of library activity.

The first two of the five broad areas of focus are well covered by the research reviewed in the findings. Enrichment of the curriculum was not identified directly but emerges from the perception and shared practice studies. Teachers' CPD provided by librarians was found to be a contributing factor in the studies examining the qualities of library service which contributed to learning impact, as well as through the critical incident questions. Impact on the wider community again was not identified directly through the searches. Links with the wider community were identified in a few studies and external collaboration and networking activities were examined by researchers amongst the library factors, however, this focus revealed least evidence.

In addition to the evidence of the type of learning the school library helps to develop, the review identified the particular library factors that have been found to have the most positive correlation with student learning. In order to make an impact the school library needs to be a welcoming environment reflecting its status as a learning centre, which is different from the classroom, with the following important contributing elements:

- A qualified, full-time librarian, who is proactive and has managerial status;
- The availability of support staff to undertake routine tasks enabling the librarian to initiate instructional, collaborative and promotional activities as well as professional duties to support collection development;
- A library that supports physical and virtual access to resources in the library, classrooms and at home, during school hours and beyond;
- An adequate physical and virtual collection that is current, diverse and supports the curriculum as well as appealing to students' leisure needs;
- Networked technology to support information access and use, and knowledge building and dissemination;
- Instruction that supports individual and curriculum needs of students and teachers, encompassing subject content, information literacy and voluntary reading interests;
- Collaboration with teaching colleagues, senior management, librarian colleagues and outside agencies, including central schools library services, to ensure the most appropriate services are delivered in support of learning.

In order to develop high quality library services adequate funding needs to be made available and senior management needs to understand the library's potential for impacting learning and be seen to actively support the library and librarian.

The review has also examined the methodologies used by researchers to capture evidence of impact and illustrates some of the advantages and disadvantages of those methods. The larger-scale statistical correlation studies can be used to analyse the impact of various library service elements on attainment in the form of test scores. Surveys, interviews, focus groups and observations identify perceptions of impact on learning outcomes in the form of curriculum assignments, development and transferability of information literacy practices and attitudes to learning.

Self-evaluation portfolios and examples of shared practice have been identified in this review as a rich source of largely unexplored data. These vignettes of practice have the potential to contribute to the evidence of indicators on all three types of learning indicator. Local school-based evidence is also a means of providing senior management and teaching colleagues with examples of practice that contribute to the impact of student learning links to school and curriculum priorities. This is particularly relevant with the introduction of the Scottish Curriculum for Excellence.

3 EVIDENCE LINKS WITH CURRICULUM FOR EXCELLENCE

One of the objectives of the review was to examine the findings with relation to the Scottish Curriculum for Excellence, in particular the links between students' attitudes to learning and the four CfE capacities: successful learners, confident individuals, responsible citizens, and effective contributors (see Section 1.4.1 for the review scope). For this purpose a small working group was established. During meetings with the project working group, it became apparent that it would be useful for the review to make links with the wider experiences and outcomes. These are set out in the curriculum documentation for each of the curriculum subject areas, including the three areas of responsibility for all: health and wellbeing, literacy and numeracy, and each subject has outcomes outlined at five different levels. In addition, the curriculum documentation states a number of further overarching outcomes and guiding principles (see Section 1.2.3).

At the beginning of the Findings section links were made with the CfE overarching outcomes and guiding principals and the first three of the five broad areas of focus for the review (see Section 2.3.1). Thus, links can be made between CfE and the learning indicators associated with attainment, achievement and broader learning, and the contributing element of enrichment of the curriculum.

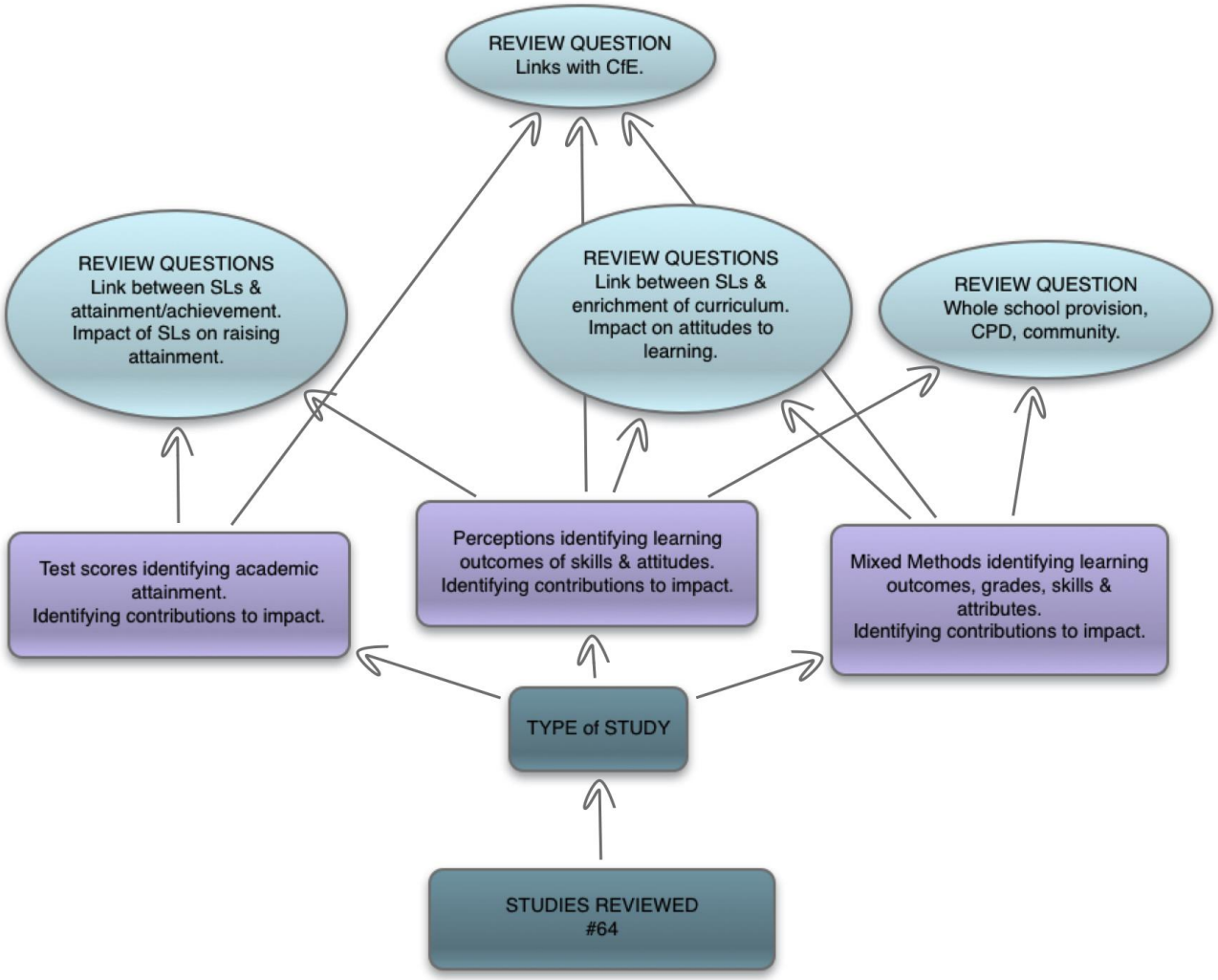
Additional links with CfE and activities of the school library can be found in the evidence from the impact studies identifying correlations between school libraries and improved test scores, accomplishment of learning outcomes, and positive attitudinal learning. However, this does assume that the school library has the key contributing factor requirements, again summarised at the end of the findings section above. In particular, the school library needs to ensure activities relate to curriculum experiences and outcomes and reflect the guiding principles. Ofsted, reporting on English school libraries inspected, commented:

> "the quality of many of the IL sessions seen was poor. The sessions were often superficial, repeated what the pupils already knew and did not form part of a coherent programme. Provision was often not consolidated through learning across the curriculum." (Ofsted 2006 pp. 17-18)

However, the Scottish curriculum provides a framework that presents opportunities for school librarians to enhance the quality of all literacy and subject related library sessions. The guiding principles also highlight teaching practices that were identified in the findings as being characteristic attributes of many school librarians: the ability to motivate and innovate, to inspire and encourage students through reading promotion and timely guidance on information related strategies.

Figure 3, below, illustrates how the different types of studies providing evidence of the impact of the school library on learning relate to the review questions and Curriculum for Excellence.

Figure 2: Mapping of Studies Reviewed and Links with CfE



In addition to the links between the published evidence and the review questions (which in turn relate to CfE), members of the project working group undertook an exercise to map the evidence of three studies of impact of the school library against Curriculum for Excellence. Although, these represent only one type of study it is felt that the evidence of learning indicators associated with these studies is representative of a number of other studies examined. The studies selected were those using the 'Help' model Todd and Kuhlthau (2005) in Ohio, Hay (2005) in Queensland and Victoria, and Todd and Heinstrom (2006) in Delaware. These were chosen because of the readily available list of 48 'Help' statements and the breakdown of the statements into Blocks that could be compared against faculty and student respondents and across studies. The group mapped findings from these studies against Literacy Across Learning, which is the responsibility of all practitioners within the school, and a sample of five curriculum areas which reflected the breadth of the Curriculum for Excellence (Social Studies, Sciences, Technologies, Religious and Moral Education and Health and Wellbeing). The secondary level (levels 3 and 4) experiences and outcomes for each curriculum area were examined to see how well they relate to the emerging evidence from

Hay (2005), Todd and Kuhlthau (2005) and Todd and Heinstrom (2006).

There is clear evidence that all seven blocks of impact (getting information, using information, knowledge, computers, reading, independent learning, and achievement) have a relationship to the Curriculum for Excellence. The experiences and outcomes for Literacy Across Learning relate substantially to all blocks of impact and therefore libraries and librarians can impact heavily in that area. In some curriculum areas, such as Social Studies, the experiences and outcomes relate well to a number of the impact blocks identified. In other cases there are more specific relationships, such as Health and Wellbeing and the 'independent learning' block (How helpful the school library is to you when you are not at school), or Technologies and the 'computers' block (How helpful the school library is with using computers in the library, at school, and at home). When mapping at levels 3 and 4 there are clear relationships. However, at times it is necessary to make a number of assumptions about what the learners could already do as the experiences and outcomes are expressed at a high level of achievement and are dependent upon the learner already having developed a range of information literacy practices at earlier stages.

The need to make assumptions at levels 3 and 4 about previous knowledge, understanding and information literacy capabilities raises potential problems. Information literacy and knowledge building are iterative processes that require reflection and constant revisiting. If teachers focus specifically on the outcomes of a particular level there is a danger that assumptions about capabilities will be made and important steps in developing capabilities will be missed, thus undermining learning outcomes to be achieved. Experiences and outcomes at levels 1 and 2 were not the focus of this mapping exercise as the project working group identified levels 3 and 4 as most appropriate for secondary level students. However, if primary age students are working at levels 1 and 2 and requiring information literacy development, there is a missed opportunity for constructive library input as few primary schools have dedicated school librarians. Yet much of the evidence identified in the review indicates that school libraries have strong correlations with student learning at this level. There were also found to be potentially confusing and conflicting terminology across the different curriculum subject experiences and outcomes and the information literacy studies of McCracken (2010) and Herring (2009 and 2011) identified the need for shared terminology across a school to enable reinforcement and transferability of competencies.

4 GAPS and IMPLICATIONS

The most obvious gap in the research findings was the limited amount of published evidence from Scotland. In addition there is a need for the statistical and anecdotal data that is already collected by the Scottish school library community to be collated in such a way that makes it available for evidence based practices and advocacy purposes. The review identified a number of different ways of achieving this.

There is potential for a large-scale study using statistic correlation analysis of library service provision with academic attainment as represented by Standard Grade and Higher exam results. This should be done on a national basis to ensure a large representative sample. The data gathered needs to be anonymous and data collection procedures need to be standardised and consistent across all schools. The statistics collected need to be based upon the aims and objective of school libraries in Scotland while reflecting wherever appropriate the evidence of services found to contribute significantly to student learning in this review.

There is potential for a large-scale study using a mixed method approach, using surveys of library users (students and teaching staff) to establish perceptions of impact of the school library on learning. A critical incident item is an important part of this type of study. The more recent studies using this approach combine the survey with other data collated through case study observations, interviews or focus groups to ensure greater depth of evidence.

There is potential for the collection of evidence in the form of examples of good or shared practice already in the public domain but scattered in a variety of places, such as HMIe reports, articles in professional journals and the websites of school library professional bodies.

There is potential for evidence in the form of self-evaluation and the maintenance of portfolios of evidence at the school level. This form of data collection needs to be encouraged and supported with good examples, especially as school libraries can now expect to be part of the school inspection process. These self-evaluation portfolios contribute to the examples of good practice and may include evidence from a number of other sources, such as questionnaire responses of students and teachers. These questionnaires could take the form of help-style questions such as those used in the US-based studies by Todd and colleagues. All evidence at the school level needs to reflect the learning outcomes and experiences or capacities and their respective attitudes and capabilities set out in CfE. This evidence will be of value in local decision-making and advocacy, as well as contributing to the shared practice data bank.

All these data collection methods need to have some form of agreed standards and consistency and there needs to be some recognised data collection point and holding bank.

There is a need for shared understanding between head teachers, teachers and school librarians about how a school library can contribute to learning. This can be done at a local school level, or authority and national level through conferences and workshops. Head teachers should be encouraged to consider school librarian qualifications and attributes when recruiting school library staff.

The main focus of this review has been the impact of the school library on learning in secondary schools. However, much of the evidence reveals the difference a school library with full-time qualified librarian can make at primary level and to the disadvantaged who have limited access to reading resources in the home. Considering this evidence it is important to ensure that these groups of students are given similar opportunities for school library resource provision as those in secondary or wealthier areas. There is potential for targeted initiatives to be set up to test feasibility and effectiveness. It is important that the action and funding is sustained in order to show results and it must be recognised that impact of any initiative will need time to reveal evidence.

5 CONCLUSIONS

The aim of this review was to identify and critically evaluate the available research evidence in the UK and abroad of the impact of school libraries on learning in its widest sense, encompassing attainment, skills and attitudes. The objectives were to:

- Identify, evaluate and summarise evidence in relation to a number of key questions identified by SLIC
- Assess the applicability of the findings to the potential of Scottish school libraries to impact on Curriculum for Excellence
- Identify gaps in the evidence and suggest areas for further research in relation to Scottish school libraries.

The scope of the project was defined in discussions with SLIC and the following key questions were identified:

- **Attainment and achievement**
  What is the link between school libraries and achievement/attainment in schools?
  What impact do school libraries have on raising pupils' attainment in schools?

- **School libraries and learning in broadest sense** (personal development and confidence)
  Can a link be made between school libraries and enrichment of the curriculum?
  What impact do school libraries have on pupils' attitudes to learning (or confidence in learning) and specifically in relation to Curriculum for Excellence capacities?
  What research has previously been done on school libraries' impact on whole school provision (i.e. impact on life of school as a whole, including teachers' development/CPD) or impact within the community?

The questions were broken down into five broad areas of focus, the impact of school libraries on:

1. Attainment and achievement, which are indicators of learning;
2. Broader learning encompassing attitudes to learning, which are indicators of learning;
3. Enrichment of the curriculum, which is a contributor to learning and an output of library activity;
4. CPD, which is a contributor to learning and an output of library activity; and
5. Impact on the wider community, which is a contributor to learning and an output of library activity.

The findings show that there is a large body of international evidence of the impact of school libraries on learning. The review has described the evidence examined in the form of indicators of learning relating to:

- Academic attainment in the form of higher standardised test scores in reading, language arts, history and maths, and better grades in curriculum assignments or exams;
- Learning outcomes in the form of higher quality project work, demonstrated understanding and application of information literacy processes and practices, increased knowledge and reading development; and
- Attitudinal learning in the form of observed or demonstrated motivation, improved attitude towards undertaking task, or self-esteem, wider reading for pleasure.

Thus the findings established a relationship between school libraries and the first three areas of the review focus and three of the five questions posed by SLIC. Enrichment of the curriculum was understood to relate to the additional motivating and innovative activities provided by school librarians, in the form of special events and clubs and often related to reading promotion. Evidence for the impact of the school library on enrichment was less strong but identified through perception or shared practice studies as well as being highlighted in a few of the statistical studies. The evidence supporting the school library's impact on learning by providing information literacy instruction and CPD activities with teachers, was also less strong but again was revealed in some large-scale statistical analyses and critical incident responses by some teachers. In these perception studies using a variety of mixed methods, individual teachers revealed their appreciation of school librarian support and instruction both for themselves and their students. There was much less evidence of the impact of the school library on the wider community. This is a particular concern for Scotland where many school libraries are joint school and public libraries and this model poses its own challenges as well as opportunities. There were occasional references to collaborative links between school libraries and other libraries or bodies indicating positive correlations with student learning. Some of the shared practice vignettes also highlighted links with the wider community which provided enrichment and a few identified external groups who appreciated activities undertaken by students under the auspices of the school library.

Examination of Curriculum for Excellence documents, including experiences and outcomes for a sample of curriculum subject areas showed links between evidence of the impact of the school library and all three types of learning indicators (i.e. attainment, learning outcomes and attitudinal learning). Not surprisingly, the closest links were found with the cross-curricular Literacy Across Learning, and good links were found between the evidence of impact and the Guiding Principles and Four Capacities for Learning. Potential barriers to effective learning were also highlighted during the mapping exercise. The mapping of findings to Curriculum for Excellence and other curriculum developments such as the National Qualifications Added Value Units would be a valuable CPD exercise for both librarians and teachers.

Evidence was also found to indicate that a quality school library can contribute to reducing the achievement gap and enabling vulnerable students to improve academic success. This is of particular interest to the Scottish Government at present.

In addition to identifying evidence supporting the impact of the school library on learning, this review has also identified evidence of school library elements which contribute to that student learning. These elements are a particular focus of studies using statistical analysis to identify positive correlations between school libraries and higher test scores. Perceptions of impact reported by library users, research observers or school inspectors also identified aspects of library provision found to be valuable in supporting attainment and achievement. These studies identified that impact on student learning is most effective when all of these elements are firmly established within the school. Elements identified are:

- A qualified, full-time librarian, who is proactive and has managerial status;
- The availability of support staff to undertake routine tasks enabling the librarian to initiate instructional, collaborative and promotional activities as well as professional duties to support collection development;
- A library that supports physical and virtual access to resources in the library, classrooms and at home, during school hours and beyond;
- An adequate physical and virtual collection that is current, diverse and supports the curriculum as well as appealing to students' leisure needs;
- Networked technology to support information access and use, and knowledge building and dissemination;
- Instruction that supports individual and curriculum needs of students and teachers, encompassing subject content, information literacy and voluntary reading interests;
- Collaboration with teaching colleagues, senior management, librarian colleagues and outside agencies to ensure the most appropriate services are delivered in support of learning.

Personal qualities and attributes of the school librarian thought to contribute to impact were also identified, these included:

- Being a good manager, communicator, instructor;
- Being confident, proactive and showing leadership;
- Being welcoming, sociable and accessible;
- Being innovative and motivating; and
- Being systematic and analytical.

The majority of the available evidence was found to be from the United States with some significant studies from Australia. Smaller studies at the school level were more widespread. The UK is beginning to lay the foundations for evidence building and a potential source of evidence in the form of shared practice was highlighted. The methodologies used to gather data have been reviewed and their advantages and disadvantages outlined to aid the decision-making for future research and developments.

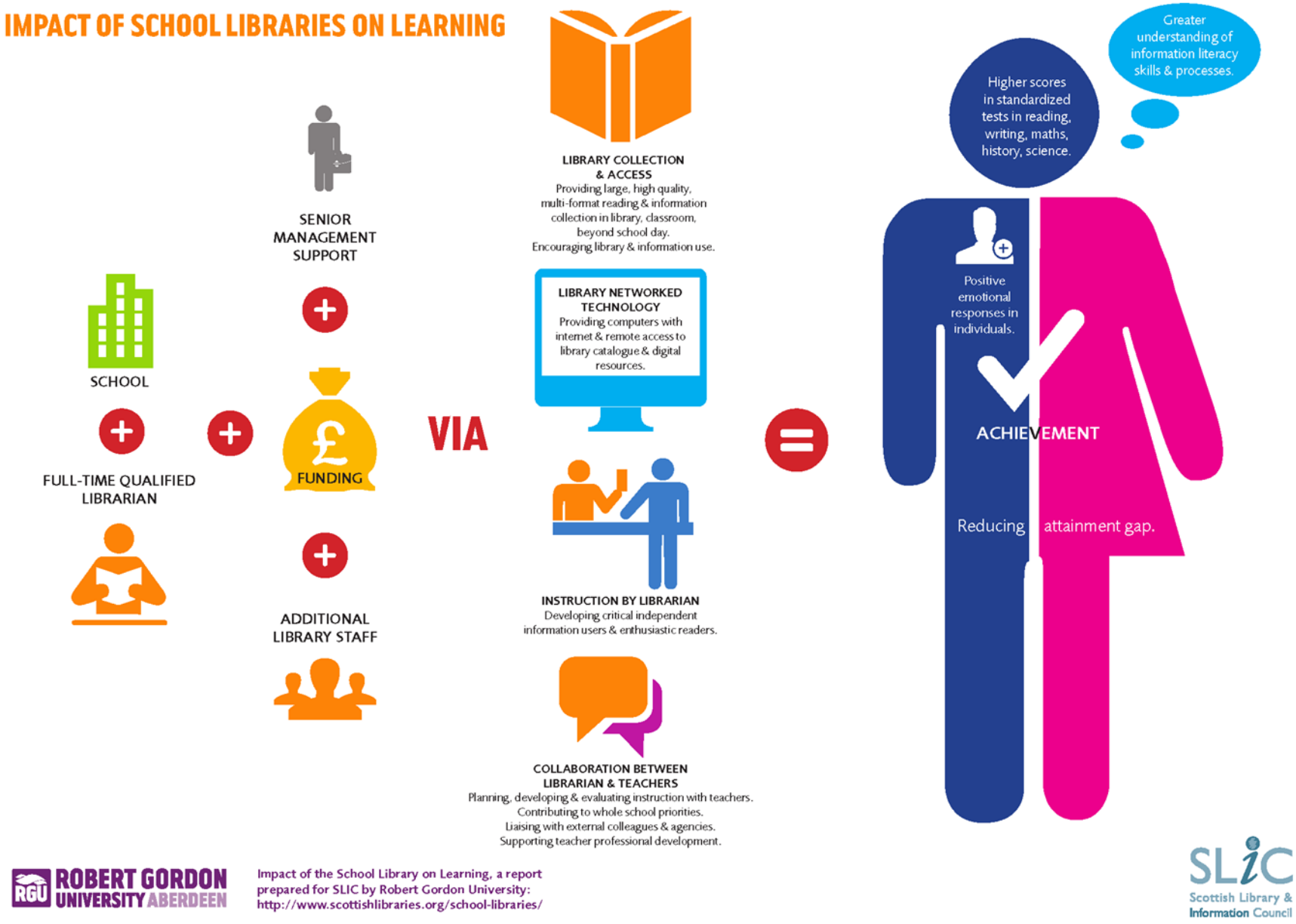
The major gaps in evidence and implications for further research were found to be:

- Limited published evidence from Scotland;
- A lack of evidence about the links or impact between school libraries and the community;
- The need for appropriate data to be collected to enable the variety of library contributions to be correlated with national examination results;

- The need to identify a way of collating and systematically reporting the evidence found in shared practice or self-evaluation portfolio documents;
- The need to identify ways in which head teachers can be made aware of how a school library can contribute to student learning and their role in recruiting appropriate staff and supporting their collaborative and instructional activities.

Without this systematic collection of evidence, it is likely that schools and their libraries will be missing opportunities to raise the standard of secondary students' learning in Scotland. The following figure summarises the difference that librarian support, funding and quality service provision can make to student attainment and achievement.

Figure 3: Graphic representation of the findings



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APPENDICES

APPENDIX A Research Protocol

This project has time limitations which cannot allow for a full systematic review set out by the EPPI-Centre guidelines for systematic reviews (EPPI-Centre, 2010). Wherever possible the methodology will follow the general principles developed in the guidelines. Thus this review strives to:

- Be transparent - with all decisions about the research protocol recorded and included in the final technical report.
- Be rigorous – all searching, reference recording and research review to be conducted using a standardised, pre-agreed format to minimise bias.
- Be objective and triangulated – with researchers checking critical stages of the review, such as the search terminology, the databases to be searched, inclusion/exclusion criteria, and selection.
- Encourage user participation – a group of practising professionals will be consulted at the end of the search and selection periods and will contribute to the mapping of findings with the Scottish Curriculum for Excellence.
- Report thoroughly and to a wider audience of professionals and practitioners.

SCOPE

The aim of the review is to identify and critically evaluate the evidence of the impact of school libraries on learning.
The objectives of the review, as set out by the funding body, are to:

- Identify, evaluate and summarise evidence in relation to a number of key questions identified by SLIC
- Assess the applicability of the findings to the potential of Scottish school libraries to impact on Curriculum for Excellence
- Identify gaps in the evidence and suggest areas for further research in relation to Scottish school libraries.

The scope of the review has been defined in discussions with SLIC, drawing on the key questions which guided a previous 2001 review (Williams, Wavell and Coles 2001) but updated to reflect the current interests within a Scottish context. The questions to be addressed are:

- **Attainment and Achievement**
  What is the link between school libraries and achievement/attainment in schools?
  What impact do school libraries have on raising pupils' attainment in schools?
- **School Libraries and Learning in Broadest Sense** (i.e. personal development and confidence)
  Can a link be made between school libraries and enrichment of the curriculum?

What impact do school libraries have on pupils' attitudes to learning (or confidence in learning) and specifically in relation to Curriculum for Excellence capacities?
What research has been previously been done on school libraries' impact on whole school provision (i.e. impact on life of school as a whole, including teachers' development/CPD) or impact within the community?

These have been broken down into three search batches:

1 school libraries and their impact on, or links with, student achievement and raising attainment;
2 school libraries and their impact, or links with, learning in its broader sense on personal development, confidence, and attitudes to learning, encompassing enrichment of the curriculum and any relationship with Curriculum for Excellence capacities of successful learners, confident individuals, responsible citizens and effective contributors and the three cross-curricular responsibilities of all: health and wellbeing, literacy, numeracy across learning;
3 school libraries and their impact or links with whole school provision, including staff development, and impact within the community.

SEARCHING

These research questions have been translated into a search strategy and specific terminology to be applied when searching electronic databases. The databases have been selected after a preliminary search of those readily available either without restriction on the web or through Robert Gordon University library subscriptions. The databases were selected because they covered journals articles or research reports in the library and education fields.

The following electronic databases will be searched:

1. Directory of Open Access Journals
2. ERIC via ProQuest Dialog
3. Google Scholar – for Science Direct, Emerald, Springer, Wiley, Taylor & Francis, Oxford and Cambridge University Presses, and SSRN
4. Library Literature and Information Science
5. LISTA Library Information Science and Technology Abstracts
6. OpenDOAR
7. Web of Knowledge
8. ZETOC
9. Metapress
10. EThOS – dissertations and theses
11. OATD – open access theses and dissertations
12. DART – European thesis & dissertation
13. NTLTD – US thesis & dissertation

The following journals or websites will be hand-searched:

1. National Foundation Educational Research (NFER)
2. British Education Index (BEI)
3. Organisation for Economic Co-operation and Development (OECD)
4. Current Education and children's services Research (CERUK)

5. Department for Children, Schools and Families (DCSF)

The research team already has experience of the topic from previous research (Williams and Wavell 2001) and will target known researchers in the field. It is expected that electronic searches will account for the majority of research reports and journal articles. However, additional limited searches will be carried out using:

- References and bibliographies,
- Hand searches of known internet sites and journals,
- Known researcher in the field.

All searches will be recorded in the Search Log (Appendix B), noting the database searched, date, number of hits, actual search terms used, location of downloaded citations.

All databases will be searched using the search terms based upon those identified in the Search Terminology (Appendix C). These terms have been chosen to cover the stated research questions in three batches. The syntax will be modified according to the individual database requirements and limitations.

Selection Process
The selection process will be conducted in three parts:

Stage 1 will be the initial electronic database or hand search for three batches of search terms. References from this initial search will be downloaded or copied into a Stage 1 RefWorks database named according to the database, website, journal searched, and the search batch, e.g. S1B1NFER.
If the database or website does not support sophisticated search strategies allowing for multiple search terms then the titles, abstracts and tags will be scrutinised and selection will be based upon the stated search terms (Appendix C).

Stage 2 will be a process of going through each Stage 1 RefWorks database and using the Stage 2 Selection Criteria Framework (Appendix D) to identify those studies that are of sufficient quality and relevance to be used in the in-depth review.
These references will be copied into a new Stage 2 RefWorks database and copies of the full article or report will be sought from web download, RGU library and interlibrary loan.
It is expected that some material will not be readily available in the time scale of the project and this material will be transferred to a separate database or recorded accordingly. Those references excluded at this stage will be transferred to a Stage 2 Reject database.
Any reference that are either problematic or thought to be useful as background material will be placed in difference RefWorks databases to be assess jointly by the research team.

Stage 3 will be the in-depth study of full articles and reports. Each will have specific information recorded on a Selection Framework (Appendix E) sheet and their references will be recorded in another RefWorks database, either

as those to be used in the annotated bibliography or in the extended bibliography.

During the selection process, a mapping exercise will be on-going, to identify research themes and to give an indication of the strength of evidence in particular research topics. This mapping exercise will help identify gaps in current research.

Record Management
There will be a series of RefWorks databases:

- Stage 1 searched database references for all three search batches, e.g. S1B1NFER
- Stage 2 those references excluded at this stage, i.e. 2Reject
- Stage 2 those references selected but unobtainable, i.e. 2NotObtained
- Stage 3 those references selected, obtained during Stage 2 and studied in-depth, i.e. 3Include

APPENDIX B Search Log

SEARCH LOG

Gateway: database/journal name, website url, etc.	
Date Searched	
Batch	
Search Terms / Limits	
Number of Hits	
Refine results – number of hits	
Refine results – number of hits	
Refine results – number of hits	
NOTES	
Name of RefWorks Database & Number of Citations Downloaded	

APPENDIX C Search Terminology

The questions to be addressed are:

- **Attainment and achievement**
  What is the link between school libraries and achievement/attainment in schools?
  What impact do school libraries have on raising pupils' attainment in schools?

- **School libraries and learning in broadest sense** (personal development & confidence)
  Can a link be made between school libraries and enrichment of the curriculum?
  What impact do school libraries have on pupils' attitudes to learning (or confidence in learning) and specifically in relation to Curriculum for Excellence capacities?
  What research has been previously been done on school libraries' impact on whole school provision (i.e. impact on life of school as a whole, including teachers' development/CPD) or impact within the community?

We also need to ensure we capture research that might be relevant for CfE, so terms must reflect the four capacities and those learning opportunities considered to be the responsibility of all learning partners:
Success*, learn*, confiden*, motivation, achieve*, thinking, literacy, numeracy, communi*, technology, independen*, self-respect, wellbeing, decision*, problem*,

school AND librar* OR "resource cent*" OR "media cent*" OR "resource service*" OR "provision of resource*"
[[if * is not supported within " ", use following separate searches]]

school AND librar* OR "resource centre" OR "media centre" OR "resource center" OR "media center" OR "resource service" OR "resource services" OR "provision of resources"

AND

impact OR link

AND

Batch 1
achievement OR attainment OR standard* OR improv* OR reading OR literacy OR skills OR learning OR numeracy

Batch 2

"personal development" OR attitude* OR confidence OR enrichment OR self-esteem OR independen*

Batch 3
"whole school" OR communit* OR CPD OR "continuing professional development" OR "teacher* learning" OR curriculum

NOT (library school) OR (academic library) OR (university library) OR (higher education)

APPENDIX D Inclusion / Exclusion Criteria

Stage 1 - Inclusion / Exclusion Criteria

Attainment and achievement
Include studies that report on:

1. school library or school resource centres or school resource services or provision of library resources
2. children or young people or pupils or students in any school setting
3. attainment or achievement
4. empirical data, including practice-based, descriptive, doctoral, thesis research, systematic review, conference paper
5. Published or reported in English
6. Published or reported between 2002 and 2013

Learning in broadest sense
Include studies that report on:

1. school library or school resource centres or school resource services
2. children or young people or pupils or students in any school setting
3. on personal development or confidence or attitudes to learning or enrichment or self-esteem or CfE capacities (successful learners, confident individuals, responsible citizens, effective contributors and 3 cross-curricular responsibilities of all: health and wellbeing, literacy, numeracy across learning)
4. report on empirical data
5. published or reported in English
6. published or reported between 2002 and 2013

Whole school provision
Include studies report on:

1. on school library or school library services or provision of resources
2. on children or young people or pupils or students in any school setting
3. on links with ICT or community or whole school provision
4. report on empirical data
5. published or reported in English
6. published or reported between 2002 and 2013

Professional expertise
Include studies that report on:

1. on school library or school library services or provision of resources
2. on school librarian or teacher librarian or teacher
3. on qualifications or attributes or qualities or training or cpd or continuing professional development
4. report on empirical data
5. published or reported in English
6. published or reported between 2002 and 2013

APPENDIX E Selection Framework

Stage 2 - General Information of potentially relevant research

Reference:
RefWorks ID:
Location of document (downloaded or not):
Document type:
Final status: included / excluded / not available

Stage 2 – topic relevance

Educational setting: School library / school resource service / provision of library resources
Educational level: all / primary / secondary / unspecified / professional

Learning Focus:
1. Academic Learning - attainment / achievement /exam or text results
2. Broader Learning - personal development / confidence / attitudes to learning / enrichment / self-esteem / community / teacher learning / teacher CPD / professional development / professional learning
3. Unspecified relevant topic (explain) –

Study type: evaluation / case study / questionnaire etc.
Study set in which country?

Stage 2 - quality

Consider quality (could be score 1(low) to 5(high) if it helps – max. score 35:

- Clarity of aims & objectives
- Study founded on previous knowledge
- Suitability of methodology
- Clarity & triangulation of evidence
- Appropriateness of conclusions in relation to aims, objectives, methodology & results
- Any detected bias, contradictory evidence?
- Any omissions in reporting?

Overall quality: poor / medium / good / difficult to judge

Stage 3 – Indepth analysis and reporting summary

Documents of high relevance and robustness to be retained for in-depth analysis.

Bibliographic reference:

Aims/objectives:

Methodology:

Results/Findings:

Conclusions:

Relevancy to Overall Review:

Relevance to Curriculum for Excellence:

Search history:

- Database / pathway
- Database ID
- Date / Searcher
- Search Terminology
- Citation only / Abstract only / Full text

Location of citation

APPENDIX F Annotated Bibliography

Data Collection Methods	Key Points from Study	Type of Learning Indicator	Contributing Library Elements

AANU, E. and OLATOYE, R., 2011. Use of library resources, study habit and science achievement of junior secondary school students. *Educational Research (ISSN: 2141-5161),* 2(7), pp. 1265-1269.

Nigeria. 360 students from 12 schools in 1 state. Junior secondary level.	Statistical correlation analysis of data from 3 questionnaires to elicit data on use of library resources, students' study habits and students' science achievement.	There was a significant relationship between any 2 variables, so use of library and study habits and science achievement are interrelated.	Higher test scores in science

ACHTERMAN, D.L., 2008. *Haves, Halves, and Have-Nots: School Libraries and Student Achievement in California.* [online] PhD thesis, University of North Texas. Available from: http://digital.library.unt.edu/ark:/67531/metadc9800/ [Accessed July 2013].

USA – California State tests CSTs 2006-7 school year, publically available school and community demographic data and a state survey of school library programs. Grades 4, 8, 11 English Language Arts test including reading comprehension component. Social studies content test for 8th & 11th grade, including history. Valid responses from: 61% of 5714 elementary students, 95% of 1257 middle graders, 84% of 1182 high school students. Secondary & primary age A very useful study for review of	Aim to examine the relationship between library programs and student achievement. Results showed substantially differing staffing levels from elementary to high school grades. Investigated relationship between staffing levels & achievement; between library element & achievement; investigated the way combination of elements relate to achievement; and staffing levels & library services. Found statistically significant correlations between staffing levels and student achievement at each grade level. The strength of the correlations	Higher reading scores Higher social study content scores.	Majority 21st Century library services regularly provided. Staffing levels at each grade level Total staffing correlates to services. Total output services correlation increasing with grade. Individual services vary with grades (resources, resource instruction, proactive communication with principal). Total input services correlated with all grades & increased with grade.

other studies.	between both certificated and total staffing tended to increase with grade level; at the high school level, correlations were among the strongest reported in any statewide study to date.		

ARNONE, M.P., REYNOLDS, R. and MARSHALL, T., 2009. The Effect of Early Adolescents' Psychological Needs Satisfaction upon Their Perceived Competence in Information Skills and Intrinsic Motivation for Research. *School Libraries Worldwide,* 15(2), pp. 115-134.

USA 1272 8th grade 13-year old students & 46 librarians in 46 schools in 20 US states. Online survey, 2008. Secondary age	Investigates SL factors influence students' perceived competence in IL & intrinsic motivation for research. Based on evidence that motivation to use & value of IL skills is important element of skills development. Findings indicate student perceptions of librarian's supportiveness & technology competence contributes significantly to their perceived IL competence & motivation for research. Examples of questionnaire statements. Student self-reported grades.	Perceived positive attitudes to research & skills competence.	Librarian technical & skills expertise. Instruction or mediation to build confidence & motivation. Opportunities to practice IL skills.

BANAJI, S., PERROTTA, C. and CRANMER, S., 2010. Best Practice 10 -United Kingdom – Scotland. Queensferry High School Cross-curricular Project. Best Practice 10, p. 49. In FERRARI, A., CACHIA, R. and PUNIE, Y. ed. *Creative and Innovative Good Practices in Compulsory Education in Europe. Collection and Descriptive Analysis of 10 Good Practices of Creativity and Innovation in Compulsory Education in the EU27.* Luxembourg: Publications Office of the European Union.

Europe - Scotland Individual examples of creative practice in schools. Scottish SL initiated example of cross-curricular activity with 12-15	Strong library initiative supported by new head teacher. Students work in groups to develop creative, critical & thoughtful approaches to international, national and local	Development of IL skills & practices. Students showed resilience & skills in undertaking for some new concepts of critiquing, evaluating, debating. Willing participation beyond school.	Librarian organization, knowledge & enthusiasm to co-ordinate & lead. Resource provision. Collaboration with teachers & senior management.

year olds. Secondary age	problems, using all forms of data & information, events & activities.	Improved knowledge of current affairs. Evidence of independence & initiative. Incremental increase in a variety of skills, knowledge, understanding & confidence.	

BAUMBACH, D.E.A., 2003. *Making the Grade. The Status of School Library Media Centers in the Sunshine State and How They Contribute to Student Achievement.* Florida School Library Media Study.

2006-7 Statistical analysis of California state test scores against 21st Century Learner standards. Responses from 61% of elementary sample of 5714; 95% of 1257 middle school sample; 84% of 1182 high school sample. Tests: English Language Arts (including reading comprehension) at Grades 4,8.11. Social Studies content test (including history) at Grades 8, 11. School & community data. Primary/secondary age	Greatly differing staffing levels across all school. Statistically significant correlation between certified staffing levels and student achievement at each grade. Generally the strength of correlations tended to increase with grade level; stated that at high school level the correlations were among the strongest reported in any study to date. There was a relationship between the majority of 21st Century standard services regularly provided and student achievement at all levels. Total services remain significant when controlled for school and community data. Useful literature review and appendices.	Higher tests scores in English language arts and US history	Total staff & then certified staffing levels. Total staffing correlates to services. Total Service outputs increase their significance with increasing grades. Relationship of individual services (resources, resource instruction, proactive communication with principal) and achievement vary with grade level. Total Services (inputs) increase their significance with increasing grade. Strongest correlation for hours open and technology.

BAXTER, S.J. and SMALLEY, A.W., 2004. *Check It Out! The Results of the 2004 School Library Media Program Census. Final Report.* Minnesota: Metronet.

USA – Minnesota 2002 & 2004 census	Relates test scores to library census & compares 2004 census with 2002	Higher reading scores	Staffing hours & qualifications Library spending

Grades 3,5,7,8 Reading & maths test scores 974 schools responded, 127 answered all questions. 1172 library media specialists responded Included library visits. Secondary & primary	census. Used 26 elements in library standards to draw comparisons with census & potential impact. School with 50% or more students receiving free or reduced-price lunch have lower staffing levels. 3-6 points higher on reading tests with libraries with higher expenditures.		District co-ordinators

BOUCHAMMA, Y. POULIN, V., BASQUE, M., and RUEL, C., 2013. Impact of Students' Reading Preferences on Reading Achievement. *Creative Education,* 4(8), pp. 484-491.

Canada Survey of 20,094 13-year-olds Secondary age	Boys spend more time reading textbooks, periodicals, Internet articles, electronic encyclopedias. Girls read fiction, informative texts. Useful for collection development. Reading achievement for both sexes determined by reading novels, informative texts, books from SL & level of interest in class reading & discussions.	Reading attitudes	Varied collection to accommodate tastes.

BURGIN, R., BRACY, P.B. and BROWN, K., 2003. *An Essential Connection: How Quality School Library Media Programs Improve Student Achievement in North Carolina.*

USA – North Carolina 994 random school libraries in 2 surveys. Reading tested at elementary & middle school grades. English tests used at high school grade level. Secondary & primary	Data on staff activities, service hours, library usage, library technology, Internet access, operating expenditures, management, school demographics. When correlation found corroboration tested by comparing high & low performing schools.	Higher test scores	Staff hours Qualified staff Hours open Collection quality Spending on resources

	Higher performing schools had 1/3rd as many staff hours as did those in low performing schools. Scores tended to increase when libraries were: staffed more, open more hours, had newer books, spent more per 100 students on print materials (bks, periodicals), spent more per 100 students on electronic access to information, more likely to subscribe to online periodical & cdrom services.		

CHU, S.K.W., TSE, S.K., LOH, E.K.Y., and CHOW, K., 2011. Collaborative inquiry project-based learning: Effects on reading ability and interests. *Library & Information Science Research,* 33, pp. 236-243.

Hong Kong Case study methodology Primary 4 students & PIRLS tests School study Primary age	Examined effects of an inquiry approach to group projects on the reading abilities of primary school students.	Reading ability (comprehension, speed & vocabulary) improved	Collaboration between school librarian & teachers

CLARK, C., 2010. *Linking School Libraries and Literacy: Young People's Reading Habits and Attitudes to Their School Library, and an Exploration of the Relationship between School Library Use and School Attainment.* (ID: ED513438). [online]. London: National Literacy Trust. Available from: http://www.literacytrust.org.uk [Accessed September 2013].

UK Survey of 17,089 pupils from 112 schools in 2009. 32 questions on survey	Questionnaire covered pupil background, reading & writing behavior, perceived ability & attitudes and library use. 68.7% indicated they use library but this declines with age and more Asians use library than other ethic groups. Girls like books, boys like technology in SL. Useful for collection	Attitudes towards reading	Library provides easy access to books & technology. Library is friendly space.

	development. SL users more likely to consider themselves as readers & enjoy reading. Also more likely to agree with statement that reading helps them find information they need or want. Seen as important to succeed in life by users and non-users. Strong link between reading attainment & SL use, study does not claim causality.		

DENT, V.F., 2006. Observations of school library impact at two rural Ugandan schools. *New Library World,* 107(9), pp. 403-421.

Uganda 2 rural schools, one with & one without SL. Qualitative & quantitative data, 2005. 85 students questionnaires, 6 focus groups, interviews with 5 school administrators & 3 library staff. 10 hrs observation. Secondary age.	Explore connections between presence of SL in 2 schools & student academic engagement indicators: attainment, reading habits, study habits, library use patterns. Not intended to demonstrate strong correlations. 5 questions: Do student make good use of SL? Do students recognize importance of SL? Do students use resources for non class-related activities? Are there any noticeable differences between grades of students with SL & those without? Do students with SL read more? Details evidence for positive responses to first 4 questions. Last question 2 schools had similar results.	Impact on student reading habits. Use of materials for non-school related activities. Academic attainment	

DIEM, C., 2012. How the presence of a technologically supported library influences high school students' reading habits and skills. *Global Advanced Research Journal of Library, Information and Archival Studies,* 1(1), pp. 001-005.

Republic of Indonesia – South Sumatra Secondary level	Aim to see the influence of 4SL factors on students' library visits, reading habit, reading comprehension achievement based on gender & type of schools. 4 factors= ICT devices, collection size, length of service-time, & acquisition & addition of collection per year. Total library factors correlate with students' library visits & with reading comprehension achievement. Contributions being 43% & 23.1% respectively. No significant difference between reading achievement between gender, but there was a difference in reading attitude & habits.	Reading achievement	ICT devices Collection size Length of service-time of librarian Acquisition & addition of collection per year.

DOW, M.J. and MCMAHON-LAKIN, J., 2012. School Librarian Staffing Levels and Student Achievement as Represented in 2006-2009 Kansas Annual Yearly Progress Data. *School Library Research,* 15.

USA – Kansas 2006-2009 Composite proficiency rates for 2008-9. 2.5 million assessment results from 1389 schools 5 subjects areas: reading, maths, science, history/government, writing Elementary, middle, high school	Examining library staffing levels (FT, PT, no LMS) & student achievement. Schools not students were used as the unit of analysis. Five categories of student performance. Found where schools maintained higher & more stable LMS staffing levels, the annual progress data showed higher proficiency rates. Small to moderate difference between no-LMS & FT LMS but critical for meeting targets.	Higher composite test scores	Staffing levels

	Larger schools less effect with only 1 LMS. Erratic staffing creates complicated results. Use of state standard collaborative approach to common language across curriculum. Regardless of poverty FT LMS outperform no LMS. Consistent across grades & subjects.		

EDWARDS, K. 2011. Is There a Place for iPods in our School Libraries and Resource Centres. *The School Librarian*, 59(3), pp. 139-140.

UK England Shared practice report Secondary age	IPods were introduced in library for checkout for GCSE exam revision notes. 6 iPods fully booked for weeks in advance. IPods fully loaded with curriculum-based audio-visual revision content by GCSEPod.	Higher GCSE exam grades increased from 59% students attaining 5 or more A*-C grades to 77%, an increase of 18%. (not claimed as SL impact alone. Increased motivation. Increased library use.	Librarian initiative & management Electronic devices Networked for school & home use Revision notes in collection, subscription for constant updating.

EYE, J., 2003. *The Relationship Between School Library Media Programs and Student Achievement on Standardized Reading Tests in Utah.*[online]. Chicago: AASL. Available from: http://www.ala.org/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume62003/utah [Accessed October 2013]

USA – Utah Grades 3,8,11 Stanford-9 (SAT-9) - reading 100/622 useable school responses to survey. Secondary & primary	Examined LMSs involvement with students & staff; funding; technology use in SL, & presence of certified LMS. Utah reading scores linked significantly to socio-economic status of students at all levels. Qualified librarian not linked with reading scores. LMSs time spent managing computer networks was significant. Access to library resources through IT was associate with higher reading scores.	Higher reading scores	Quality collection Networked resources

	Up-to-date collections were strongly associated with higher test score, very significant with 11th grade.		

FARMER, L.S.J., 2006. Library Media Program Implementation and Student Achievement. *Journal of Librarianship and Information Science,* 38(1), pp. 21-32.

USA – Southern California 60 schools, 9 elementary, 12 middle, 8 high schools Grades 2-11 Small sample Reading & API core subjects Use of 21st Century learner standards Secondary & primary	Adapted AASL 1999 library standards for self-reporting rubric with test scores, centred round teaching & learning, information access & delivery, program administration. Examined relationship between librarian & administrators' perceptions of library media programs. Taken as a whole, significant difference for only 3 factors: integrated IL standards, physical access to facilities, effective library operations. Different grades different factor correlations. At high school level significantly higher reading scores with physical access to facilities, appropriate staffing & CPD by librarians.	Higher reading scores	Access Collaborative planning & instruction Administrative support Program planning Program communication & Instruction Collection Administration Compliance-related activities (copyright) Library networking

FODALE, F. and BATES, J., 2011. What is the impact of the school library on pupils' personal development? A case study of a secondary school in Northern Ireland. *School Libraries Worldwide*, 17(2), pp. 99-113.

Northern Ireland Case study of secondary school in disadvantaged area. Interviews & postal questionnaires from staff & parents.	Explores impact of SL in terms of personal development & how best to evaluate such impact. Use of Inspiring Learning for All GLO framework of: knowledge &	Perceptions of positive impact: on motivation to learn, self-esteem & personal confidence; attitudes towards reading & IL skills development.	Library as independent study space not always available at home. Welcoming, stimulating place. Opportunity for pupil librarians.

Secondary age	understanding; skills; attitudes & values; enjoyment, inspiration, creativity; activity behavior & progression. Includes quotes as evidence of impact.		

FRANCIS, B.H., LANCE, K.C. and LIETZAU, Z., 2010. *School Librarians Continue to Help Students Achieve Standards: "The Third Colorado Study (2010)." A Closer Look.*
LANCE, K.C., November 2010. *School Librarians Continue to Help Students Achieve Standards: The Third Colorado Study.*

USA 3rd Colorado Study Elementary level 2007-8 school library data & 2008 CSAP reading scores. Primary only	Strong link between school library data & students scoring proficient or advanced on CSAP reading. Also associated with reduced %s of students receiving unsatisfactory CSAP scores. Full-time endorsed librarian linked to better scores: 68-72% scoring proficient or advanced & 9-11% scoring unsatisfactory compared with schools without librarians 64-68% & 12-13%. Expenditures: 68-72% 9-11% with & 62-67%, 12-14% without librarian. Library visits: 67-72%, 10% with & 62-67%, 12-14% without librarian. Periodicals & video collecions	Higher reading scores Reducing achievement gap	Staffing Funding Visits Collection

GILDERSLEEVES, L., 2012. Do school libraries make a difference? Some considerations on investigating school library impact in the United Kingdom. *Library Management,* 33(6), pp. 403-413.

UK Pilot phase of study using multiple surveys, interviews & focus groups on selected sample of schools &	Aim to identify key contributions by SL or librarian. Perceptions & expectations of SL & librarian.	Perceived help with IL (finding, ethical use, independence) skills & practices.	Instruction Collection organization to meet user needs. Library as work space.

correlations with school performance ranking.	Findings tend to support hypothesis that a correlation may be traced between good library provision & positive pupil engagement with reading & information skills. Pupils & teachers have considerable difficulty articulating the differences SLs & librarians contribute to experiences. Authors suggested lack of language & overall conceptual framework. McCracken (2010) described one school's approach to developing common conceptual understanding. Quotes by students identified library inputs that helped them. Authors reported missed opportunities by librarians for mutual understanding. Gives good review of current evidence & research in UK.		

GILLESPIE, A.M., 2006. *Teacher-librarian contributions to student literacy standards.* Queensland: QUT.

Australia PhD study Year 3,5,national benchmark tests for reading. 4 teacher-librarians & case study of 1 librarian. Small scale Primary age	Pilot project to establish whether teacher-librarian can have positive impact on literacy levels, & effective strategies & work practices & how they demonstrate effectiveness (in Appendices). Also reveal hindering issues: time, inadequate support staff levels, low budgets.	Perception of impact from each teacher-librarian	Opening hours beyond school hours Inviting library space Provision & delivery of resources to teachers.

GOY, C., 2009. Making a Difference: How a Reading Scheme and an Unusual Competition are Helping to Ring the Changes in the Northern Pennines. *The School Librarian*, 57(4), pp. 206-208.

UK England Shared practice Secondary age	Library introduced Renaissance Learning Accelerated Reader. Timetable reorganized to enable Key Stage 3 pupils 20mins of reading/day. Data monitored by librarian with regular reports to teaching staff. Written by assistant head.	Increases in reading ages for all.	Collaboration between librarian, teachers & senior management.

HAY, L., 2005. Student learning through Australian school libraries. Part 1: A statistical analysis of student perceptions. *Synergy,* 3(2), pp. 17-30.
HAY, L., 2006. Student learning through Australian school libraries. Part 2: What students define and value as school library support. *Synergy,* 4(2), pp. 27-38.

Australia – Queensland & Victoria Years 5-12 Scaled questionnaire of 48 'help' statements to students, teachers, librarians. Also one critical incident question. 6718 submitted responses, 5474 critical incident responses. Secondary & primary	99.40% of 6676 students indicated SL & its services (including school librarian) helped them in some way. Similar to Ohio 99.44%. Ranking also similar to Ohio, 96.3% Q12 "The information in the school library helped me work out the questions for the topics I am working on", 95.7% Q11 "The school library has helped me know the different steps in finding and using information", 94.8% Q13 "The school library has helped me find different sources of information (such as books, magazines, CDs, websites, videos)". Selection of quotes from critical incident responses illustrating impact on broader learning.	Achievement in learning outcomes Critical incident responses reflect impact on broader learning: self-esteem, confidence, motivation, incentive to learn	Computer & internet use & support. Librarian expertise (organizing information for curriculum relevance). Instruction (helping with study mgmt., information need, web evaluation) Library environment

HAYCOCK, K., 2011. Connecting British Columbia (Canada) School Libraries and Student Achievement: A Comparison of Higher and Lower Performing Schools with Similar Overall Funding. *School Libraries Worldwide,* 17(1), pp. 37-50.

Canada - British Columbia Reading literacy, per-student funding, school library data 300 questionnaires to top & bottom 100 elementary schools & 50 high schools. 84 (28%) validated responses. Low-performing schools under-represented. 4 & 7 grade reading comprehension scores, grade 10 FSA scores & grade 12 provincial exams. Secondary & Primary	Examining schools with similar funding but with differing test results for student achievement, i.e. higher & lower performing schools. 52 library predictors replicated from previous studies, clustered into 7 categories: access, staffing, activities, usage, ICT access, library resources, annual budget & expenditures. Reinforce finding from other studies.	Higher performing schools had higher levels of library activities.	Access Volunteers Staffing Time allocation & teacher partnerships Usage Technology Funding

HERRING, J., 2009. A grounded analysis of Year 8 students' reflections on information literacy skills and techniques. *School Libraries Worldwide,* 15(1), pp. 1-13.

England 21 year 8 students in one secondary school class. Student diary & interviews with teacher. Secondary age	English assignment of discursive essay requiring balance argument of chosen topic. Used IL skills. Aim was to understand how student reflect on IL skills, their ability to link IL to their assignment, factors influence confidence & IL attributes. Findings organized into 4 categories: using IL skills; making links; being confident; being reflective.	Teacher reported some improvement in quality of students' writing. Engagement with brainstorming & concept maps. Evidence of some evaluation skills.	Collaboration

HERRING, J.E., 2011. Year 7 Students, Information Literacy, and Transfer: A Grounded Theory. *School Library Research,* 14.

Australia, New South Wales Year 7 students, TLs & teachers in 3 schools.	Examined IL & transferability. Findings outline value students place on IL practices & factors determining	Evidence of IL practices Limited evidence of transferability	[Instruction or mediation & collaboration required but not necessarily demonstrated in study]

Grounded theory including observation, student diaries, questionnaires, interviews. Secondary age	strafe of practices across time & subjects. 3 groups: minority engaged in learning, value IL & likely to transfer; majority potential for engagement but unlikely to transfer without intervention; small minority who fail to grasp concepts and don't transfer. Found lack of culture of transfer in schools hinders development of students as transferrers. Interesting comparison with McCracken (2010) where culture of transfer has been established.		

HUGHES, H.; BOZORGIAN, H., 2013. *School libraries, teacher-librarians and their contribution to student literacy development in Gold Coast schools. Research Report*. Brisbane, Australia: School Library Association of Queensland. Available online http://www.slaq.org/research [Accessed July 2013]

Australia – Gold Coast, Queensland Elementary schools 97 schools, 27 principals responded. Open & closed questions on demographics, NAPLAN test scores fro reading & writing Pilot study, small scale, conducted 2012 Acknowledges contestability & limitations of standardized test scores. Good summary of key findings from all studies to date Primary only	Aim to investigate status of school library provision & staffing; and how SLs & teacher-librarians contribute to students' literacy development. Literacy related to library activities. Principals views on contributions of SL & librarian to literacy development. Findings consistent with current research: links between literacy outcomes & qualified librarian. Schools with librarian generally had more literacy activities. Lower the student:library staff ratio= higher the NAPLAN national mean score for reading & writing. Even more pronounced with teacher-librarian. Strongest for reading but	Higher reading & writing scores	Full-time qualified staff Library leader Collaboration Resource expert Technology promoter Peer educator

	significant for writing. 50% schools with T-L had NAPLAN scores higher than national mean for reading & writing for corresponding year group. Schools without T-L scored consistently below national mean for reading & writing		

HUYSMANS, F., KLEIJNEN, E., BROEKHOF, K., and DALEN, T.V., 2013. The Library At School: Effects on reading attitude and reading frequency. *Performance Measurement and Metrics,* 14(2), p. 4.

Netherlands Evaluation of leisure reading intervention in primary schools involving. Data collected 2011-12, from 4,682 2-6 grade students from 229 classes, 284 teachers from 68 schools. Primary age	Nationwide Library at School programme. Evaluation took place just after implementation. Only 32 of 77 schools had a library, others linked with public library or library service. Those with school libraries provided more opportunities for book related activities. The more often pupils visit the library, the more they like reading books. Reading aloud to class showed slight positive effect. Multilevel regression analyses showed it was too early to show effects on reading attitudes and leisure reading, although slight positive univariate effects were found. Suggests that a school library alone may not be enough and that the role of a reading-media consultant might have to be strengthened.	Positive reading attitude	School library Reading media specialist Reading promotion activities

KLINGER, D.A., LEE E.A., STEPHENSON, G., DELUCA, C., and LUU, K., 2009. *Exemplary School Libraries in Ontario.* Toronto, Canada: Ontario Library Association.

Canada Southern Ontario 8 selected elementary SLs identified as exemplary. 200 students at least in each school. Student/teacher surveys, teacher/librarian/administrator interviews, activities & practices, observation. Primary age	Aim to identify characteristics of exemplary elementary school library. Includes quotes from participants. Authors discovered "vision of library as a classroom & welcoming place of learning are key facets of exemplary school libraries."p.3 Outlines challenges particularly for collaborative work. Only limited evidence of student perceptions of help from SL. Reports students in exemplary SLs had positive attitude to SL, stated they would like to use it more often, stated they liked reading & thought they were good.	Positive attitudes	Librarian qualities Principal support Instruction Collaboration with teachers & parents Wide variety of activities Developing teacher competency & confidence.

KRASHEN, S.D., 2004. *The Power of Reading: Insights from the Research*. Westport, CT: Libraries Unlimited.
KRASHEN, S., 2012. *The Power of Reading.* The COE Lecture Series. Georgia: The University of Georgia. [online]. Available from: http://www.youtube.com/watch?v=DSW7gmvDLag [Accessed October 2013].

USA All ages	Research indicates free voluntary reading each day improved reading development. Gains may take a year to show in any meaningful way. Incentive reading programmes give message that reading is something not good & may not work longterm. Digital reading (texts & articles) are valuable.	Improved reading development	Free voluntary reading for 10 mins. every day. Availability of plenty of free reading material.

KRASHEN, S., LEE, S. and MCQUILLAN, J., 2010. An Analysis of the PIRLS (2006) Data: Can the School Library Reduce the Effect of Poverty on Reading? *CSLA Journal (California School Library Association),* 34, pp. 26-28.

USA - worldwide 4th grade PIRLS 2006 data on reading achievement Primary age	Aim to analyse the PIRLS data for specified countries selecting a few factors from PIRLS questionnaire that theory predicts will be important predictors of reading achievement. Confirms that variables related to reading are powerful predictors of reading test scores: high socio-economic status (SES) generally means more access to books outside school, more sustained silent reading time means more reading, access to libraries is associated with more reading. The impact of the SL is nearly as strong as the impact of SES, suggesting that a library can mitigate to some extent SES.	Improved reading ability	Access to reading material.

LANCE, K.C. and HOFSCHIRE, L., 2012b. School Librarian Staffing Linked with Gains in Student Achievement, 2005 to 2011. *Teacher Librarian*, 39(6), pp. 15-20.
LANCE, K.C. and HOFSCHIRE, L., 2012a. *Change in School Librarian Staffing Linked with Change in CSAP Reading Performance, 2005 to 2011.* Library Research Service.

USA – 4th Colorado study Grades 3 to 10 Used existing Colorado state statistical data on SL staffing & test scores, 2005 & 2011 Secondary & primary	Aim to examine the relationship between staffing levels & reading achievement over time. Test scores categorized as advanced, proficient, partially proficient, or satisfactory. Summarised reading scores by schools.	Higher reading scores	Qualified full-time librarian

	Found positive & statistically significant relationship between advance reading levels & endorsed librarian staffing trends. Schools maintaining or gaining a qualified LMS between 2005 & 2011 tended to have more students with advance reading scores & to have increased their performance than those without or losing LMSs, 45% & 49% respectively that those that either lost or never had one (33% & 20& respectively). Also a negative & statistically significant relationship between unsatisfactory reading levels & endorsed librarian staffing trends. In 2011, schools with at least one endorsed averaged significantly higher advanced CSAP reading scores 8% vs. 6% and significantly lower unsatisfactory scores 9% vs. 11% than schools with less than one FT endorsed librarian. Even when controlled for poverty. Those not managed by endorsed librarian had no significant link with reading scores.		

LANCE, K.C. and SCHWARZ, B., 2012. *How Pennsylvania School Libraries Pay Off: Investments in Student Achievement and Academic Standards*.
KACHEL, D.E. and LANCE, K.C., 2013. Librarian Required: A new study shows that a full-time school librarian makes a critical difference in boosting student achievement. *School Library Journal,* 59(3), pp. 28-31.

USA – Pennsylvania Test scores: PSSA Reading at grades 3-8, 11	3 phases. 2011 library survey & test score data, examining relationship of SL infrastructure & test scores;	Reducing achievement gap (often stronger link than for non-disadvantaged)	Staffing – qualified & support Flexible scheduling Instruction on information literacy

Writing at grades 5, 8, 11 Also Core standards of English language arts & literacy in history/social studies, science & technical subjects. Survey of perceptions. Over 2180 schools responded to survey.	perceptions of administrators, teachers, librarians about SL programs & LMSs & relationship to test scores; estimated statewide costs of SL infrastructure components found to have positive association with achievement. Examined economically disadvantaged (black, Hispanic, disabilities). Evidence that SLs & LMSs can substantially help reduce achievement gap. Advanced scores more likely & below basic scores less likely when students have access to all 12 measures of infrastructure, not explained away by socio-economic or demographic factors. Generally when activities are valued & reported as undertaken more they assess the library role in supporting learner standards as excellent.	Writing scores more significant than reading. Perceptions suggest higher scores are achieved by developing 21st Century Common Core Standards.	Better Funding Better equipment & stock More accessible In-service CPD provider

LANCE, K.C., RODNEY, M.J. and HAMILTON-PENNELL, C., 2005. *Powerful Libraries Make Powerful Learners. The Illinois Study.* Illinois:

USA – Illinois Grades 5,8 ISAT reading & writing Grade 11 PSAE Reading & ACT English, Maths, Science, 2003, 657 schools in participated in voluntary survey	Other factors correlated: household income, per pupil spending, teacher-pupil ratio, ethnicity. Where correlations found between dimensions of SLs & appropriate indicators of academic achievement, test performance was compared for schools with stronger & weaker library variables to determine differences in achievement associated with stronger SL	Reading scores Writing scores Subject content	Flexible access Total staff hours Collaboration (identifying materials, planning, motivating, teaching, committees, networking) Collection size Expenditure Technology – online resources in classroom Visits, individual & group

	programs. Elementary schools reporting more flexible access performed 10% better in reading & 11% better in writing than 5th graders with less flexible access. High schools 6% higher reading & 5% higher ACT scores. Only household income has stronger influence. Higher staff levels linked to higher reading scores E13%, M8%, H7% and writing scores E17%, M18%, & H5%ACT scores. E. level persists regardless of per pupil spending, teacher-pupil ratio or rate/ethnicity. At 8th & 11th grades persists despite household income. All grade levels test scores tend to be higher.		

LANCE, K.C., 2010. The Impact of School Libraries on Academic Achievement-A Research Study Based on Responses from Administrators in Idaho. *School Library Monthly,* 26(9), pp. 14-17.
LANCE, K.C., RODNEY, M.J. and SCHWARZ, B., 2010. Collaboration Works—When It Happens! The Idaho School Library Impact Study. *Teacher Librarian,* 37(5), pp. 30-36.
LANCE, K.C., RODNEY, M.J. and SCHWARZ, B., 2010. *Idaho School Library Impact Study. How Idaho School Librarians, Teachers and Administrators Collaborate for Student Success.* Idaho: RSL Research Group.

USA – Idaho Grades 3,4,5, elementary, 7,8 middle, 10 high school. Achievement = % with advanced scores. Test scores & perception surveys. 2009 Idaho ISAT reading & language arts. 285 librarians coordinated survey –	Examining relationships between administrators & teachers have with their LMS, how SLs & LMSs are valued & perceived, how those factors effect libraries & their impact on achievement. Findings varied by grade, very different responses between qualified & non-qualified staff.	Reading & language arts scores Quotes reveal broader learning indicators – highly engaged, motivation, skills, winning competitions	Qualified librarian Collaboration Instruction in information literacy to students & teachers (CPD) Administrator support Technology integrators Teachers requesting help has relationship with scores at high school.

238 librarians, 668 teachers, 174 administrators. Large amount of data Quotes from survey critical incident items. Secondary & primary	Self-assessment of ICT standards teaching. Where administrators value strong library programs & can see them doing their part for student success, students are more likely to thrive academically.		

MARDIS, M., 2007. School Libraries and Science Achievement: A View from Michigan's Middle Schools. *School Library Media Research,* 10.

USA – Michigan 8th grade MEAP science test scores Science attainment Mixed method qualitative data & Michigan SL Survey & science test scores 196 schools in sample Early Secondary	Perceived relationships & statistical analysis of test scores. LMSs find it hard to interact with science dept.	Science test scores	Media collection (number of videos per 100 students) science collection Technology Reported enrichment activities to extend science

MCCRACKEN, I., 2010. The future is skills. *Library and Information Research,* 33(105), pp. 20-35.

Scotland Shared practice, review of implementation of whole school skills rationale & programme. School in deprived area. Secondary age	Useful information on the process of collaboration to establish joint understanding & implementation of programme, incorporating IL. Author makes links with CfE. Describes impact on expectations & skills, as well as careers & employer reactions.	Pupil recognition of personal skills. Analytical skills to enable transferability across different situations. Increased employability.	Collaboration Librarian knowledge

MICHIE, J.S. and CHANEY, B.W., 2009. *Second Evaluation of the Improving Literacy through School Libraries Program.* (ID: ED504205). Jessup, MD: US Department of Education.

USA Grants given to districts with 20% or more students from low income families. Survey from 2005-6 test scores data	Introduced program to improve literacy skills & academic achievement by increased access to up-to-date SLs with qualified staff, technology, resources.		Student usage Collaboration

& received grants in 2003-4.	Findings showed increase in usage but no significant change in materials checked out. Grantees reported more collaboration. No definitive statement on test scores but evaluation thought to be too recent to make a significant difference.		

NELSON, J.V., 2009. *Leadership through middle school library programming: impact on Latino student achievement.* Ed.D. thesis, San Diego. Available from: http://escholarship.org/uc/item/3c076734 [Accessed August 2013].

USA - California 3rd, 7th 8th grades Mixed methods, California Assessment Test Sixth edition (CAT/6), CST California Standards (English/language arts,, maths, grade 3 & 7)state library survey, interviews with LMSs EdD thesis	Examined staffing, access, resources & services provided through middle SLs in California. Looked at poverty, English language fluency, ethnicity. Higher performing schools provide higher percentage of library services & resources for Latino & white students.	Reading scores Reducing achievement gap	Professional staffing

NEW YORK LIFE FOUNDATION, 2006. Students at New York Life Revitalizing High School Libraries Sites Talk About Why Their Library Media Centers "Rock"! *New York Life*, 2. Washington: Public Education Network.

USA Questionnaire to over 600 students Secondary age	Pilot scheme to refurbish 4 high school libraries in 3 states. States that reading behaviours reported are strongly associated with higher reading & academic achievement. Includes student quotes providing evidence of improved attainment, learning outcomes & attitudes.	Increased talking about books, reading for fun, reading academic material. Increased grades, quantity & reading development. Improved attitude to study. Knowledge building. Improved vocabulary.	Welcoming, comfortable library environment, and new resources. Extended hours & more flexible access resulted in increased use for work & in own time.

NORTH LANARKSHIRE COUNCIL EDUCATION RESOURCE CENTRE, 2005. *Examples of good practice in secondary school library resource centres.* [online] Available from: http://www.northlanarkshire.gov.uk/CHttpHandler.ashx?id=1752&p=0 [Accessed August 2013].

UK Scotland Vignettes of activities Secondary age	Report to highlight good practice exemplified by HMIe Libraries Supporting Learners. Example is vignettes of particular activities. Perceptions of librarian, often inputs rather than outcomes. Some provide ways of capturing evidence of impact during an activity.	High standard of work. Improved motivation & discussion about reading. Increase in reading attainment. Demonstrated ability to access & learn from range of sources. Increased self-esteem, confidence, enthusiasm.	Collaboration Reading promotion Library borrowing Instruction in IL Linking with school priorities

OFSTED, 2006. *Good School Libraries: Making a difference to learning.* Manchester: Ofsted.

UK England Inspection data collected from 32 school visits, 2004-2005. Primary/secondary age	Survey designed to follow up Ofsted findings. Reports on good & weaker SLs & factors leading to improvements. Reported poor quality of IL programmes.	Reported impact on pupils' personal development.	Head teacher support. Qualified librarian given middle mgmt. status. Collaboration. Qualified librarian. Effective monitoring & evaluation. Coherent programmes for developing IL. Librarian qualities of initiative & enthusiasm. Links with school priorities. Creative use of resources & space. Pupil librarian opportunities. Reading promotion.

OFSTED. 2011a. *Ofsted good practice resource - promoting reading in a secondary school: Don valley school and performing arts college* [online] Available from: http://www.ofsted.gov.uk/resources/good-practice-resource-promoting-reading-secondary-school-don-valley-school-and-performing-arts-coll [Accessed September 2013].

HOPSON, Lyn. 2013. Whole-school Literacy: Achieving Recognition for you School Library. *The School Librarian*, 61(2), pp. 70-71.

England Self-evaluation & inspection Shared practice Students largely from disadvantaged backgrounds. Secondary age	School focused on improving students' attitudes to reading, enhance progress in English & improve literacy across curriculum. Library projects provide a focus for work. Dedicated, knowledgeable librarian.	Improved standards. Attitudinal outcomes - positive attitudes towards reading.	Whole school involvement. Collaboration with teachers, senior management & parents or carers. Senior management support. Librarian qualities. Welcoming library environment. Use of technology as motivator. Increased library visits.

OFSTED, 2011b. *Removing Barriers to Literacy.* Manchester: Office for Standards in Education, Children's Services and Skills.

England Inspection visits to providers of childcare (45), secondary schools (37), primary schools (61), colleges (21), training providers (16), adult learning, prison & young offenders, 2008-2010. Selected as previous inspection data provided evidence of enabling improvements in literacy to disadvantaged young. All ages	Focused on those eligible for free school meals, looked after children & white British boys from low-income families. In 2nd year, focused on pupils eligible for free school meals reaching at least national average levels of attainment to identify good practice. Successful schools introduced additional dedicated library lessons or reading time.p42 "All schools visited had well-resourced libraries, often with computerized loan systems and facilities for accessing learning resources on an intranet. Libraries in the secondary schools were often open for much longer than the school day. This enabled students to	Schools emphasized the contribution the school library made to improving literacy skills.p.42	Well-resourced Networked resources Longer opening hours Librarian qualities

	complete their homework on the school's computers before and after school. The enthusiasm and responsiveness of the librarian generally had a direct impact on the attitudes of the students towards the library and reading." P42		

POSCOPELLA, A., 2005. *Heart of the school | district administration magazine* [online] Available from: http://www.districtadministration.com/article/heart-school [Accessed September 2013].

USA Delaware One district's report on investment in SLs. Small example Primary/secondary age	Reports that before students test scores were in the middle of the state average, following funding, now among top performing schools in reading, maths & writing.	Higher attainment in reading, maths & writing.	Funding Qualified librarians Open/flexible access Reading promotion

QUALITY RESOURCES LLC, MILLER, J., WANT, J. and WHITACRE, L., 2003. *Show Me Connection: How the School Media Centre Services Affect Student Achievement 2002-2003.* Missouri: MO Department of Elementary and Secondary Education Missouri State Library.

USA – Missouri Weighted Av. Missouri MAP index scores – reading & non-reading (social studies, communication arts, health/PE, fine arts, maths, science together).	Impact on test scores not negated by: school factors of free/reduced lunch rate, % African Americans, teacher education; or Community factors: % poverty, median household income, educational level.	Reading scores Non-reading scores	Library usage Summer reading Library access Budget Librarian qualifications

Core date from 2243 schools, survey results from 782 schools. Variety of core data All grade levels Secondary & primary	Characteristics having a strongly significant impact: library usage, summer reading program. Significant impact: library access, budget, & librarian qualifications No significant impact: library space, collection, staffing, library mgmt. & library activities.		

QUEEN'S UNIVERSITY AND PEOPLE FOR EDUCATION, 2006. *School Libraries and Student Achievement in Ontario.* Ontario: The Ontario Library Association.

Canada - Ontario Grades 3 & 6 Primary level	Schools with qualified librarian tend to have higher proportion of Grade 6 attaining level 3 (meeting provincial standard) or higher than schools without librarian. Schools without trained staff tend to have lower achievement on grades 3 & 6 reading tests. Survey reported steady decline in students reporting that they like to read. At same time there has been steady decline in % elementary schools with teacher-librarians.	Higher reading scores Reporting positive attitude to reading	Qualified librarian

ROBERSON, T., SCHWEINLE, W. and APPLIN, M.B., 2003. Survey of the influence of Mississippi school library programs on academic achievement: Implications for administrator preparation programs. *Behavioral & Social Sciences Librarian,* 22(1), pp. 97-114.
ROBERSON, T.J., APPLIN, M.B. and SCHWEINLE, W., 2005. School libraries' impact upon student achievement and school professionals' attitudes that influence use of library programs. *Research for Educational Reform,* 10(1), pp. 45-52.

USA – Mississippi Grades 2,4,8,10 19% of 834 librarian response rate. 149 from successful districts, 11 from unsuccessful districts. Limited ability for comparison	Impact on attainment & how teacher, principal & librarian perceptions shape function & use. Successful rated schools had larger collections (more bks, magazines, electronic subscriptions, video, ref	Higher test scores	Collection Technology Budget Library use Collaboration Staffing hours

Perceptions phase 880 participants (principal, teachers, librarians) 5 star school rating system.	CDRoms & software), higher budgets, library use, more technology, & staff spending more time at meetings with teachers & reading incentives. Unsuccessful schools reported more open hours but less usage. Second article on perceptions phase comparing affective & attitudinal differences to cooperative activities. Teachers less amenable to cooperation with librarian than principals. Teachers thought librarians should spend more time with students. The more positive attitude to librarian the more amenable to cooperation.		Reading incentives

RODNEY, M.J., LANCE, K.C. and HAMILTON-PENNELL, C., 2002. *Make the Connection Quality School Library Media Programs Impact Academic Achievement in Iowa.* Iowa: Iowa Area Education Agencies.

USA Iowa 169 schools at 4th grade, ITBS test for basic skills. 162 schools at 8th grade ITBS. 175 schools at 11th grade ITED test for educational development. Quotes reporting evidence Secondary & primary	Aim to identify characteristics of library programs & librarians that effect achievement; Assess collaboration & growing role of IT. SL programs accounts for 2.5% of variation in Iowa reading scores for 4th & 8th graders. Differences not explained by: district expenditure per pupil, teacher/pupil ratio, %classroom teacher with MS degree, (weaker) children in poverty, ethnicity, (stronger) adult education. Staff hours correlated to: planning	Higher Reading scores. Anecdotal evidence: motivation, IL practices, engagement, wider resource use. p.90 for evidence of improved reading especially Hispanics	Qualified staff hours per 100 students Total staff hours per 100 students Print volumes per student Periodical subscriptions per 100 students. Principal support Collaborative planning & teaching More recent collections Higher usage Reading incentives Other factors varied with grades. Anecdotal evidence: inspiring

	with teachers, in-service training, meetings, managing networks; reading incentives, collection quality, technology development, usage.		reading, supporting student & teachers IL practices

RODNEY, M.J., LANCE, K.C. and HAMILTON-PENNELL, C., 2003. *The Impact of Michigan School Librarians on Academic Achievement: Kids Who Have Libraries Succeed.* Lansing, Michigan: Library of Michigan.

USA – Michigan MEAP reading tests Grades 4 & 7 Secondary & Primary	Test scores rise with qualified school librarians, greatest % increase at elementary level. Relationship not explained away by other school or community conditions at any school level. 8% in high schools to 35% in elementary schools.	Higher reading test scores	Qualified staff, more staff hours More hours open Collection & budget Collaboration Extensive & sophisticated IT networks Usage Instruction at elementary level Reading promotion Collection development Open access at middle high school level In-service CPD teaching

SHAH, S.Z.U. and FAROOQ, M.S., 2009. Effect of School Library on Students' Learning Attitude. *Online Submission,* 24, pp. 145-151.

Pakistan 70 high schools, 560 teachers randomly selected. 16 item opinionaire with 5-point Likert scale. Secondary age	Positive responses to statements about welcoming SL learning environment; encouraging LLL; positive attitudes to study & learning; positive study habits; knowledge & understanding; gives sense of confidence; enhances skills; & self-concept; motivates further reading.	Perceptions of positive attitudes to learning, study & reading.	

SHAPER, S. and STREATFIELD, D., 2012. Invisible care? The role of librarians in caring for the 'whole pupil' in secondary schools. *Pastoral Care in Education,* 30(1), pp. 65-75.

UK National survey to establish census of SL provision & activities. 2009-2010, 1542 secondary schools responded to library questionnaire, 1044 completed the activities survey. Secondary age	Survey did not ask questions on student social development. Librarian critical incident responses revealed 3 key aspects of their contribution: support for learning; maintaining a safe & secure environment; providing individual support. Qualified librarian more likely than non-qualified staff to engage in instructional & collaborative activities. Number of examples of inputs and perceived or actual learning outcomes.	Librarian perception of enhancing self-esteem. Example of improved grades, reading & confidence from attendance at homework club in SL. Parent reported increased confidence as result of library & librarian support.	Safe, welcoming, peaceful, accessible library environment, different from classroom. Librarian training & qualities

SMALL, R.V., SHANAHAN, K.A. and STASAK, M., 2010. The Impact of New York's School Libraries on Student Achievement and Motivation: Phase III. *School Library Media Research,* 13.
SMALL, R.V. and SNYDER, J., 2009. The Impact of New York's School Libraries on Student Achievement and Motivation: Phase II--In-Depth Study. *School Library Media Research,* 12.
SMALL, R.V., SNYDER, J. and PARKER, K., 2008. *New York State's School Libraries and Library Media Specialists: An Impact Study. Preliminary Report.*
SMALL, R.V., SNYDER, J. and PARKER, K., 2009. The Impact of New York's School Libraries on Student Achievement and Motivation: Phase I. *School Library Media Research,* 12, pp. 2-2.

USA – New York State library statistics, school demographic data & test scores. Survey of Perceptions of motivation, administrators' support, & adequate resources for disabilities. Examples of critical incident responses	3 phase study: phase 1 general survey to 38.5% of LMSs & 13% principals. Findings indicate: schools with certified LMSs more likely to have higher scores regardless of resources available at elementary level. LMSs more likely to select materials with diverse points of view	Higher English & language arts scores for 4th graders.	Qualified school librarian providing Resources of differing points of view & supporting curriculum Responses to critical incident item report assistance during research process, technology assistance,

All grades	to support curriculum. LMSs perceptions of motivating students correlated with importance they place on teaching IL skills. Principals perceive higher support for LMSs than LMSs perceive there to be. LMSs report lower levels of resources for students with accessibility issues. They play important role in technology use in schools. Phase 2: in-depth study of 7 areas of inquiry (IL finding info, IL using info, IL evaluating info, technology use, respect for diversity, collaboration, professional development, individualized educational programs, assistive technology, inclusion & collection development, learning climate). Phase 3: examining implementation of 2008 AASL 21st Century Learner Standards.		collaboration with teachers. Instruction Collaboration

SMALLEY, T.N., 2004. College success : high school librarians make the difference. *Journal of Academic Librarianship,* 30, NUMB 3, pp. 193-198.

USA – California Small scale Study looked at students at Cabrillo College, Santa Cruz California and the three districts they attended high school. One district has school librarian and the other two don't. 506 students were identified according to stated criteria. Secondary/college age	Reports on identified need for high school students to have good working knowledge of library use to make successful use of college libraries. Reinforces need for IL instruction in schools & importance of librarian instruction. The college looked at records on Library 10 grade rosters and asked whether those from high schools with librarians do better in Information	Information literacy competencies & practices	Librarian instruction in information literacy

	Research course than those from high schools without. Mid point check, 57% students from district with school librarians scored in top third, in the other two districts the figures were 25% & 15% For scores in the lowest third the scores were 15% with librarian, 38% & 45% for others. Final check 66% students with librarians earned A grade. The other two were 43% & 37%. These students had had time to practice and review their skills over the period of the course.		

SMITH, E.G., 2006. *Student Learning Through Wisconsin School Library Media Centers. Library Media Specialist Survey Report.* Austin, US: EGS Research & Consulting Division for Libraries, Technology and Community Learning.

USA Wisconsin 855/1083 completed surveys. Knowledge & Concepts Exam (WKCE) in reading & language arts. Survey of SL programs, staffing qualifications, demographics (questionnaire included in report) 5 case studies	Study examined leadership & instructional roles of Wisconsin librarians required for robust information & technology progamme & direct relationship with/impact on student achievement & learning. Tracked scores against staffing, hours open, collections & funding. Well-staffed libraries, especially with full-time professional & support staff, exhibit greater impact on student academic performance. Higher performing schools tend to have greater resources & services than	Higher test scores ("Schools with trained library staff are more likely to have higher proportion of Grade 6 students who attained level 3* or higher on reading tests. Students without trained library staff tend to have lower achievement on the grades 3 and 6 reading tests (both in terms of average achievement and attaining level 3 or higher)" p.5 With teacher-librarian or library technician schools could expect to	Paid staff Collaboration Technology – computers & access to resources Book collection Visits by individuals Expenditure per student

	lower performing schools. Grades 3 & 6 students with teacher-librarians are more likely to report that they enjoy reading.	have reading scores approx. 5.5 percentile points higher than the average, the relationship is stronger at grade 6 than grade 3.)	

SMITH, L., 2010. Our iPod Touch Experiment. *The School Librarian*, 58(2), p. 71.

England Self-evaluation Shared Practice Secondary age	Librarian started reading books on iPod in library to attract attention. Interactive or with music.	Engagement with reading.	

SOFTLINK, 2012. *Softlink Australian School Library Survey 2012.* (www.softlinkint.com). Australia: Softlink.

Australia Years 3,5,7,9 637 school responses to questionnaire with 31 questions covering: general school details, budget & staffing, Ebooks & accessibility, emerging issues, Federal funding, views on opportunities & challenges. Secondary & primary	Softlink provides library software. Surveys in 2010, 2011, 2012 all reveal positive correlation between NAPLAN literacy scores & two key library resourcing indicators, including budget, number of school librarians. Both budget & librarian correlations strengthens as students progress from Grade 3 to Grade 9. "School libraries with lower funding achieve lower than the national average reading literacy scores. Those school libraries that receive higher funding show higher than the national average reading literacy scores. This finding reinforces the outcomes of the 2010 and 2011 surveys." P9 Future trends: eBooks, mobile devices, digital resource access (although Softlink research identified	Higher NAPLAN literacy scores	Budget Staffing levels.

	this as an underdeveloped resource though 75% of teacher librarians think providing access to the catalogue, ebooks, & electronic resources to mobile device and outside school hours as important.		

SULLIVAN, 2013, *Institute of Education News & Events 2013*. [online] London: Institute of Education. Available from: www.ioe.ac.uk/newsEvents/89938.html [Accessed September 2013].
SULLIVAN, A. and BROWN, M., 2013. *Social inequalities in cognitive scores at age 16: The role of reading*. CLS Working Paper 2013/10. London: Centre for Longitudinal Studies. Available from: http://www.cls.ioe.ac.uk/[Accessed September 2013].

UK Longitudinal survey of social inputs & habits All ages	Longitudinal British Cohort Studies provides periodic & comprehensive data on number of social aspects of life.	Positive attitude to reading is good indicator of reading ability. Reading ability is best indicators for academic success in schools & later life. Reading for pleasure increases progress in maths, vocabulary & spelling between ages 10-16	Library visits Wide & regular reading Reading newspapers (at 16 is 4times greater than advantage of parental education) e-readers & budget to support them

TODD, R.J., GORDON, C.A. and LU, Y., July 2010. *Report of Findings and Recommendations of the New Jersey School Library Association Survey Phase 1: One Common Goal: Student Learning.* CISSL NJSLA.
TODD, R.J., GORDON, C.A. and LU, Y., September 2011. *One Common Goal: Student Learning. Report of Findings and Recommendations of the New Jersey School Library Survey Phase 2.* New Jersey: CISSL NJSLA.
TODD, R.J., 2012. School Libraries and the Development of Intellectual Agency: Evidence from New Jersey. *School Library Research,* 15.

USA – New Jersey Phase 1 in 2008-9, survey of 765 schools, 30% of total in New Jersey. Phase 2 in 2010-11, 12 LMSs chosen for in-depth analysis using focus groups. Primary/secondary age	Phase 1 gives status of public SLs in NJ: infrastructure, personnel, resource & IT provision, instructional & admin work. Instructional role predominant characteristic, cooperations, coordinations & fewer collaborations.	Perceived test score achievement. Developing resource-based competencies. Developing thinking/knowledge-based competencies. Affective learning. Interpersonal competencies.	Qualified staff Principal support Instructional role in IL Variety of information formats to develop multimodal literacies. Cooperations & collaborations Supporting curriculum content

	Seen as due to 84.5% are qualified school librarians & 52.5% have some support staff to free time for instructional collaborations. Strong IL support & 96.1% meet with principal during year. 721 LMSs contribute to learning outcomes in 6 key ways (see learning indicators column) Provides quotes to support evidence of learning indicators. Phase 2 in-depth analysis of 'stories' of perceived student learning & SL, from focus groups with administrators, teachers & LMSs in selected schools.	Reading skills & interests. Attitudinal learning: excitement, interest, motivation for learning, engagement.	Developing process of discovery & knowledge development.

TODD, R.J. and HEINSTROM, J., April 2006. *Report of Phase Two of Delaware School Library Survey: "Student Learning Through Delaware School Libraries" Part 2 Summary of Findings & Recommendations.* New Jersey: CISSL.
TODD, R.J. and HEINSTROM, J., undated. *Reports for the Governor's Task Force on School Libraries Delaware Study.* New Jersey: CISSL. Available from: http://www2.lib.udel.edu/taskforce/study.html [Accessed September 2013]
TODD, R.J., February 2005. *Report of the Delaware School Library Survey.* New Jersey: CISSL.

USA 2 phase study, 5733 valid student responses, 468 faculty from 13 selected schools with quality SLs Scaled questionnaire of 'Library Helps' Similar method of 'help' statements as Ohio. Primary/secondary age	48 'help' statements in 7 blocks of questions about: 1-getting information, 2-using information, 3-knowledge, 4-computers, 5-reading, 6-independent learning, and 7-achievement with 5-point ranking. 98.17 responded that SL, especially LMSs helped them to some degree. Student ranking of 'helps': 4,1,2,3,5,7,6 Faculty ranking: 4,1,5,2,3,7,6, The subjects where help seemed to	Help with assignment, finding resources, reading, learning & ICT skills.	Providing flexible place of completion of work. Social interaction environment. Qualified librarian Information & technology infrastructure Instructional interventions & support mechanisms Caring environment

	have most impact in terms of remembering content were English, Social Studies, Science, Language Arts. Library seen as enabling transformation of information into learning. Transition from learning to read to reading to learn.		

TODD, R.J. and KUHLTHAU, C.C., 2005. Student Learning Through Ohio School Libraries, Part 1: How Effective School Libraries Help Students. *School Libraries Worldwide,* 11(1), pp. 63-88.
TODD, R.J. and KUHLTHAU, C.C., 2005a. Student Learning Through Ohio School Libraries, Part 2: Faculty Perceptions of Effective School Libraries. *School Libraries Worldwide,* 11(1), pp. 89-110.
TODD, R.J. and KUHLTHAU, C.C., 2005b. Listen to the Voices Ohio Students Tell Their Stories of School Libraries*. Knowledge Quest,* 33(4).
TODD, R.J. and KULTHAU, C.C., 2004. *Student Learning Through Ohio School Libraries: Background, Methodology and Report of Findings.* New Jersey: CISSL.

USA 39 effective SLs, 13,123 students, 879 faculty Grades 3-12 Survey of students, teachers, school principals and librarians. 48 'help' statement in 7 blocks. Primary/secondary age	Aim to examine how effective SLs help students with learning in & out of school, considering both human & non-human interventions. The help the library makes is described as being 'helps-as-inputs' or help that engages students in the process of effective learning and 'helps-as-outcomes' that demonstrate meaningful learning or academic achievement. The 'helps' are strongest in the elementary school and decreases as students progress through schooling. Students saw little value in library instruction that was repetitive, not building on previous knowledge and	Perceptions of help finding information, using computers, information use and to complete school work. Teaching staff ranked help with reading interests higher than students. Reported evidence that SL is informational, transformational, and formational – leading to knowledge creation, production, dissemination & use.	Information literacy instruction. Library as active, rather than passive, agent of learning.

	skills, not contextualized by specific curriculum contents and required learning tasks, and which were not clearly linked to the goal of completing research efficiently and successfully.		

TONNE, I. and PIHL, J., 2009. Literacy enhancement in practice–collaboration between school and library. In: *Proceedings of International Conference on Primary Education.* 25-27 November 2009 Hong Kong.

Norway Mixed method study 3 classes in 2 schools, 1 public library Small scale 2007-2011 Primary age	Reporting on preliminary results of Literacy Project examining relationship between library use & reading achievement. 1 school had well functioning library with knowledgeable librarian in 2009. Development in average reading speed of 76 words per minute Nov 2008 to 92 in second test April 2009. For teachers this was considered good development. There was particular improvement for a few pupils scoring below the critical limit of 50 words per minute. Correlation between pupils recording reading of many books during the school year and fast reading. More improvement in reading recorded by group of Norwegian as non first language than Norwegian first language group.	Reading speed Amount of reading	'Book flooding' programme introducing variety of books and frequent visits to library.

TWIST, L., SIZMUR, J. BARTLETT, S., LYNN, L., 2012. *PIRLS 2011: Reading achievement in England*. Slough: NFER. Available from: http://www.nfer.ac.uk/nfer/publications/PRTZ01/PRTZ01_home.cfm?publicationID=853&title=PIRLS%202011 [Accessed September 2013]

UK England	Comparison of English PIRLS findings	Higher reading attainment	Large collection of book resources

Primary/secondary age	with other countries, examining reading attainment, provision of resources including SLs. "Internationally, pupils attending schools with well-resourced school libraries had higher attainment than those with few library books or no school library at all."p.65 Authors report difficulties of interpreting data.		

ULLAH, S.Z. and FAROOQ, M.S., 2008. Quality Libraries Produce Quality Learners. *Journal of Quality and Technology Management,* 4(2), pp. 1-9.

Pakistan 480 school teachers from 60 high schools 18 statement questionnaire with 5-point Likert scale Secondary age	Teacher perceptions of the importance of libraries. Found that both make & female teachers were in favour of student use of libraries to increase academic achievement. Perceived SL to enhance study habits; impact reading ability, learning & grades, finding information; motivates reading & class contribution; promotes ideas creation & use of information, language development, critical thinking, technology use.	Perception of enhanced attainment, skills and attitudes.	

WRIGHT, D., 2012. Exposure to E-Books: Exciting or Extravagant? The School Librarian, 60(3), pp. 138-139.

Scotland Self-evaluation Shared Practice Primary/secondary age	Five Kindles gifted to school library. WiFi only, not 3G, to keep control over downloads. Library ordered ebooks using gift certificate bought by finance dept. Pupils can request book to be	Reported increased engagement with reading. Sense of achievement.	

	purchased at point of need. No page numbers, only % so sense of achievement rather than daunting. No judging what you read as no one can see. Built in Dictionary.		

Abbreviations used: SL=school library; IL=information literacy/skills; CfE=Curriculum for Excellence; TL=teacher-librarian; LLL=lifelong learning; mgmt.=management; FT=full-time; PT=part-time; LMS=library media specialist.

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