



Information literacy impact framework

Final project report, August 2022

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Executive summary

This report presents findings from a review of literature reporting on information literacy (IL) impact. It is intended to deliver considerations towards a framework for impactful IL interventions, including development of parameters to guide impact assessments.

The project team has:

- from an initial set of over 6000 results, developed a longlist (170 items) for possible inclusion in the detailed review and then drawn up a shortlist (26 items) to be included in the detailed review
- classified the longlist and shortlist in three dimensions: geography, context and method of study
- drawn initial conclusions on the scope and nature of IL impact research, most significantly the dominance of research in the education and library context carried out in Europe. These were presented in the project's interim report in early June 2022.
- refined and developed the themes reported in the interim report.

The key findings are that components of impactful IL interventions are:

- evaluation should be around effectiveness and outcomes
- choice of clear frameworks and structures to measure impact
- ensuring integration and relevance of the intervention
- collaboration between stakeholders
- design of content and delivery methods
- repetition and follow-up
- management buy-in and budget.

The next steps for the project are:

- (1) Presentation of findings at CILIP's annual conference
- (2) Publication of findings in *Journal of Information Literacy* and/or a CILIP professional journal, including recommendations for best practice.

A further step would be to obtain funding to further develop and test the draft framework in conjunction with MILA. This would be separate to, but draw on, the forthcoming review of 'information literacy and society' commissioned by MILA.¹

¹ The call for that review is at <https://mila.org.uk/news/call-for-proposals-il-and-society>.





1 Introduction

Information literacy (IL) – defined as the ability to find, understand, use, manage, and communicate information – is an essential capability for living and working in the digital age (Welsh & Wright, 2010). IL interventions aim to enhance IL capabilities, and are thought to have a considerable impact on society as they facilitate meaningful engagements with information across work, education, and leisure settings (Khan & Idris, 2019; Sundin et al., 2008).

There has been much research into IL interventions in higher education (Blake et al., 2017; Brooks, 2014). However, the impact of IL interventions across settings such as work, leisure, healthcare is not well understood. This is in part because there is no agreed definition of IL intervention impact and there are no set parameters to guide impact assessments.

Furthermore, there is uncertainty as to whether impact assessment should encompass both positive and negative effects; intended and unintended consequences; social, economic, cultural, environmental, or technological dynamics; and short-term and long-term processes (Choi et al., 2007; Cohen et al., 2014; Lockie et al., 2008; White, 2010). There is thus a rift between the assumed and symbolic value of IL in society, and its demonstrable, evidence-based value as an essential component of work, education, leisure, and citizenship in the Information Age.

This in turns creates a need for the development of a clearer definition of IL impact, and of a more coherent articulation of the current and potential benefits of developing IL competencies in citizens. This project aimed to begin to address this rift.

2 About this project

2.1 Origins of this project

Researchers Bruce Ryan and Marina Milosheva, both members of the Centre for Social Informatics at Edinburgh Napier University, heard of the Media and Information Literacy Alliance (MILA) soon after its creation in 2021. IL is a key part of their research interests. Hence both were keen to make contributions to MILA's work, seeing it as an avenue for academic research that would have tangible societal benefits. Both independently joined the MILA working group scoping a literature review of the impact of IL on society. During this working group's deliberations, it became clear that it would first be necessary to define what 'impact' means in this context. That was the starting point for this project.

Meanwhile, Edinburgh Napier University was offering small starter grants for projects that would help develop research skills. Peter Cruickshank has supervised and mentored aspects Ryan's research, and is also Milosheva's Director of Studies. He was hence the natural choice to lead Ryan and Milosheva's IL/MILA work. Together they developed a successful funding bid, leading to this report and underpinning future activities outlined in it.

2.2 Project overview

This project maps the current landscape of IL impact assessment research by recording findings in the literature on best practices and gaps in knowledge with regards to the tangible outcomes of IL interventions. It responded to two research questions:

- (1) 'How is impact defined in IL interventions?'
- (2) 'What are the success factors behind impactful IL interventions?'

The first stage was conducted between 1 April 2022 and 31 May 2022. It consisted of a scoping review of IL impact reported in peer-reviewed literature. It started from two initial assumptions:



- (1) IL impact can be broadly understood to be the outcome(s) of an IL intervention. This includes behavioural or attitudinal markers of impact, but does not include the development of IL skills. Rather, the formulation of IL impact used in this project pertained to the effect of IL skills or IL instruction on another observable phenomenon.
- (2) No standardised measure of IL impact assessment has been developed to date. Therefore, conceptualisations of IL impact may not always be presented as 'impact', or assessed formally. For this reason, interpretive flexibility has to be employed when seeking to explore the meanings of *IL impact* in practice. Hence the outcomes of this project are intended to be a response to this gap.

The second stage (June and July 2022) was identification of the factors that are likely to lead to impactful in IL interventions to support the construction of an outline information Literacy Impact Framework.

3 Selection of papers for evaluation

To ensure a fully systematic scoping review of IL impact, a broad and geographically inclusive strategy was used. English-language outputs (including books and conference papers) published from 2005 onwards were considered for inclusion in the scoping review. Two reviewers (Ryan and Milosheva) independently examined and scored publications based on previously agreed criteria. The project consisted of several filtering and sense-making stages, presented in Table 1:

Table 1: selection stages

Stage	Description
Development of keywords	Keywords were assess, benefit, effect, evaluat*, impact, indicator*, measur*, monitor*, outcome, output, result
Collection of results (N = 6177)	Two databases were searched: LISTA and Web of Science. Duplicate results were removed.
Focus on IL (N = 3816)	Results which did not have <i>information literac</i> in title and/or abstract were removed.
Focus on relatively recent results (N = 3707)	Results from before 2005 were removed, to match other MILA work
Drawing up longlist (N=170)	Both reviewers independently reviewed titles and abstracts, looking for results focussing on impact. During this process, a further 26 duplicates were removed. <ul style="list-style-type: none">• When the reviewers agreed that a paper focussed on impact, it was added to the longlist. There were 135 such papers.• If one reviewer found that a paper 'definitely' was impact-focussed, but the other found it 'maybe' was impact-focussed, the reviewers discussed these papers. Hence of 74 'yes-maybe' papers, 35 were added to the longlist.• If both reviewers found that a paper was 'maybe' impact-focussed, this paper was excluded from the longlist. There were 363 such papers.• If either reviewer found a paper was not impact-focussed, it was excluded from the longlist regardless of the other reviewer's assessment. There were 3109 such papers.



Stage	Description
Drawing up shortlist (N = 26)	<ul style="list-style-type: none"> Both reviewers independently assessed each longlisted paper for significance, quality and rigour (SQR), each awarding 3 for high SQR, 2 for intermediate SQR, 1 for low SQR. Papers with total SQR scores of 6 or 5 were added to the shortlist. There were 22 such papers, listed in Table 3 below At this stage, the longlist papers' geographies, contexts and methods of study were noted. (See Table 2 below.) It was found that the shortlist was more Eurocentric than the longlist, and that the shortlist had higher proportions of 'everyday' and 'workplace' studies. Hence four papers with total SQR score 4 focussing on America, Asia, or 'citizenship' or 'conceptual' studies were added to the shortlist.

Publications included in the longlist were categorised as relating to three dimensions **Geography**, **Context**, and **Methodology** as shown in Table 2. The papers in the shortlist are presented in Table 3 in the Appendix.

Table 2: longlist and shortlist items' geographies, contexts and methods of study

Geography	Long-list	Short-list	Context	Long-list	Short-list	Method of study	Long-list	Short-list
Europe	38	12	Education	91	15	Quantitative	64	11
Americas	56	7	Library	22	3	Mixed	18	8
Africa	14	2	Workplace	11	3	Qualitative	20	4
Asia	18	4	Everyday	5	2	Lit. review	9	0
Oceania	11	1	Health	10	2	NA/none	59	3
Global	4	0	Citizenship	3	1	--	--	--
NA/not stated	29	0	Conceptual	1	0	--	--	--
--	--	--	NA/not stated	27	0	--	--	--
Totals	170	26	Totals	170	26	Totals	170	26

Notes:

Method of study: papers were sifted by topical relevance before categorisation by methodology. At this point, papers were rejected once it was established that no 'proper' impact assessments were performed and reported within them.

Some of the shortlisted papers had 'no' documented method of study. However, they were retained because they contributed valuable practical considerations:

- IL interventions about fake news: Auberry (2018)
- frameworks for evaluation of IL impact (Markless & Streatfield, 2017; Streatfield & Markless, 2008)

Geography: During shortlisting, the proportion of papers focussing on Europe more than doubled (from 22% to 46%), and 'global' and 'unallocated' papers were eliminated. On reflection this unexpected filtering may have happened because titles and abstracts were reviewed before geographies were classified and authors who do not report the contexts of their research presented their work in ways that reduce their papers' SQR values.

It is also possible that excellent IL work outwith the anglosphere has been excluded because the project team searched only for papers written in English.



4 Key findings from the evaluation

An initial review of the selected papers showed that while instances of impact are apparent in the literature, formal and purposeful impact assessment is rarely performed. The assessment of IL impact is often not the primary objective of research projects.

As noted above, the selected publications show a bias towards Europe, even over the Americas, which is somewhat surprising given that the search was restricted to English-language papers. More predictable (unfortunately) is the lack of research reporting on Asian and African contexts.

In terms of impact assessment generally, the main observations from the literature include:

- Impact assessment is most commonly found in institutions, particularly in the education domain (e.g. Y. H. Chen, 2015; Craig & Corral, 2007; Daugherty & Russo, 2011; Hopkins & Julian, 2009), and to a lesser extent in the library domain (Doney, 2006). Long-term impact is measured rarely (L. C. Chen et al., 2014; Maranda et al., 2016).
- Discussions of means of impact assessment are scant, with the exception of Crawford's (2013) chapter on the topic of IL impact assessment methods, and the critical review of IL impact assessment in higher education by Markless and Streatfield (2017). Here, the authors critique the paucity of systemic evaluation and measurement of IL impact, despite the presence of much excellent IL work.

Differences between contexts are also seen:

- The impact of educational IL initiatives has been evidenced primarily in the form of student learning and achievement indicators, such as increased use of suitable sources, better memorisation and comprehension of subject content, improved critical thinking skills, and higher degrees of self-confidence associated with information use (L. C. Chen et al., 2014; Craig & Corral, 2007; Doney, 2006). However, impact on student learning does not always transpire into higher grades (e.g. Squibb & Mikkelsen, 2016).
- In the library, IL impact is apparent in the increased use of the library portal, and more positive perceptions of the library as a whole (Y. H. Chen, 2015). Thus, the most immediate impact of IL interventions is on the behavioural indicators and metrics associated with information use.
- In the workplace, improvements in organisational innovation can be attributed to IL interventions (Ahmad et al., 2020). IL also begets added business value through cultural changes and increased information use (Cheuk, 2008), and impacts on the degree to which ethical practices are adopted in organisations (Forster, 2013).
- In everyday and health applications of IL, impact is evident in citizens' increased readiness for self-directed learning and positive health outcomes (Hirvonen et al., 2016; Seifi et al., 2020)

In terms of research methods, IL impact is most frequently demonstrated through quantitative methods and mixed methods research. Qualitative research methods are less popular overall, yet they have an established presence in all IL context classifications, and are not reserved for the assessment of specific types of impact. The most popular methods for impact assessment are surveys, observation, group discussion, interviewing, and phenomenographic methods (Crawford, 2013, p. 211).

These findings are developed in the following section to identify the factors that point to effective interventions.



5 Towards an information literacy impact framework

This section responds to the project's two main research questions and identifies the key papers that in each area.

5.1 Defining successful impact in IL interventions (RQ1)

Generally, it appears that impact is evaluated (and hence defined) in terms of outputs/efficiency/'busyness' instead of outcomes/effectiveness. For example:

- Daugherty and Russo (2011) evaluated their intervention in terms of whether students used the skills they were taught but not whether this was associated with higher grades.
- Doney (2006) describes an outreach project by her library service. She notes the importance of evaluation, but evaluated increases in delivery of IL skills sessions, requests for literature searches, and book issues to the nurses Doney's service supports, rather than outcomes such as more capable nursing or improved healthcare outcomes.
- Similarly, Howard and Gill (2005)'s success criteria include increased use of their library, improvements in bibliography writing, increased use of document supply, increased understanding of search, increased use of IL tutorials. Clearly some of these are outputs, not outcomes.
- Petrak et al (2008)'s evaluation is based on self-reporting of inputs: the usefulness of course content, lecturers' preparedness, presentation style. While these factors may well be important precursors, they do not evaluate tangible improvements in practice or outcomes in medical practitioners' continuous professional development.

As will be seen in the next section, there are clear calls to evaluate/define impact in terms of longer-term outcomes.

5.2 The success factors behind impactful IL interventions (RQ2)

It had been anticipated that all shortlisted results would include information on how the reported IL interventions generated impacts, what those impacts were, and how they were evaluated. Extracting such details would have then led to a simple table or figure of success factors for IL interventions. In practice, this was not fully achieved because several papers omitted some or all of these details.

However, it is possible to draw lessons from the results of the review. The components of a potential information literacy impact framework are evaluated in the following subsections, in relation to relevant papers from the shortlist (shown in italics).

5.2.1 Evaluation should be around effectiveness and outcomes

Craig and Corral (2007), Crawford (2013), Forster (2013), Lee et al. (2020), Markless and Streatfield (2017), Seifi et al. (2020), Squibb and Mikkelsen (2016), Streatfield and Markless (2008)

Clearly it is necessary to understand whether any intervention has had impact, and what this impact is, i.e. how well the intervention has 'worked'.

Markless and Streatfield (2017, p. 113) advocate against simply collecting 'busyness statistics' (i.e. outputs) towards engagement with user experiences with libraries. These authors' papers, and their 'how-to' book (Streatfield & Markless, 2012), provide clear thinking on how to undertake evaluation. The 2008 publication reports an example of stimulating impact evaluation in university libraries, using 'facilitated action research'.

The 2017 paper can be seen as a framework of questions to ask about how to evaluate IL interventions as they are planned. It notes the support for evaluation needed from 'leaders of LIS education



programmes, staff of academic institutions, library leaders and managers and IL practitioners' (Markless & Streatfield, 2017, p. 106). The framework of questions covers three main areas:

- the levels of expertise required, and where leaders of LIS programmes, academic staff, library leaders/managers and IL practitioners fit into this context. The authors are concerned that library leaders/managers are biased towards action rather than articulating clear, meaningful impact objectives.
- 'inclusive approaches to impact evaluation', and is concerned with moving away from reinforcing existing power relationships. To further this, the authors recommend three simple questions:
 - who are the evaluations for?
 - who should decide what to evaluate and how?
 - who owns the results and decides what to do with them?
- That any IL intervention needs a strong Theory of Change, i.e. 'a description and illustration of how and why a desired change is expected to happen'.

The other papers related to this component might be seen as footnotes to these authors' work:

- Craig and Corral (2007) state that 10% of IL literature is about assessment (measuring learning) and evaluation (effectiveness of interventions). They point out that perceptive measures (e.g. self-efficacy) are often used in assessments and evaluations, such measures do not objectively evaluate 'real' IL. This point is echoed by Kennedy and Gruber (2020) and Maranda et al (2016), who point out that confidence is not related to knowledge.
- Crawford's (2013) chapter also notes the paucity of assessment of IL interventions. He suggests that 'higher order' factors (i.e. outcomes) should be measured, using validated tools such as SCONUL's Satisfaction Survey², The Public Libraries Plus survey³ and the LIBQUAL+ survey⁴. Such factors include improvements to knowledge, and changes in perceptions and actions, even though it is difficult to quantify these. Crawford also suggests collecting both positive examples of how information is used and failures that could have been prevented. He commends Streatfield and Markless (2012) and Lipu et al.'s *Exploring Methods in Information Literacy Research* (2007).
- Seifi et al (2020) provide a positive example of measuring outcomes using an IL scale developed specifically for a certain geography (in this case, Iran). This scale uses the measures 'readiness for self-directed learning', 'readiness to overcome deterrents to participation', 'readiness to respond to triggers for learning', 'readiness for lifelong learning' (Jamali Mahmuei & Alizadeh, 2013).
- Uzuegbu (2019) provides a topical instance of 'IL instruction'. Uzuegbu's approach is simply talking to rural villagers about sustainable development goals (SDGs), rather than enabling them to work with such information. However, he notes how 'IL provision' around SDGs can stick in peoples' minds, and lead to actions such as travelling 29 miles to deal with non-biodegradable waste.

There are at least three caveats in the shortlisted papers' comments on evaluation. Firstly, Forster (2013) builds on Brettell (2003, 2007) to show that it is not always clear that interventions can be proven to be effective. Secondly Lee et al. (2020) note that learners are not homogenous, which tacitly calls for nuance in evaluation. Thirdly, in Squibb and Mikkelsen (2016)'s intervention, IL instruction had no statistically significant effect on grade-point averages.

² <https://www.sconul.ac.uk/page/sconul-satisfaction-survey>

³ <https://www.cipfa.org/services/research/subscribers-area/plus-adult-library-survey>

⁴ <https://www.libqual.org/home>



5.2.2 Choice of clear frameworks and structures to measure impact

L. C. Chen et al. (2014), L. C. Chen et al. (2017), Craig and Corrall (2007), Forster (2013), Kennedy and Gruber (2020), Markless and Streatfield (2017), Seifi et al. (2020)

Several papers advocated the use of frameworks and structures to underpin IL interventions:

- Markless and Streatfield (2017, p. 113) state that IL interventions, and their evaluations, require strong Theories of Change. These should be tied with clear objectives that can then be evaluated, and focus on changes to people, and hence pedagogy. These researchers' library teams found, *inter alia*, that it was important to focus on one aspect of provision, e.g. a [single] aspect of IL.
- Seifi et al (2020)'s intervention was based on the SCONUL (2011) model of IL, and Kuhlthau's information search process model (Kuhlthau, 2003). They used a scale by Kungu (2010) to measure LLL readiness, as well as (Jamali Mahmuei & Alizadeh, 2013)'s IL scale. The SCONUL model was also used by Craig and Corrall (2007), although these researchers omitted pillars 6 and 7 ('manage' and 'present'). As Forster (2013) points out, the synthesis of information supported by these two pillars is a key part of IL.
- Chen and colleagues advocate inquiry-based methods such as Big 6 and super3, in projects that are integrated into the curriculum, and require students to investigate and deliberate (L. C. Chen et al., 2014, 2017). This leads to improvements in both memory and comprehension of subject matter. The latter is a clear goal of IL interventions. These authors tacitly recommend ongoing interventions throughout the school career, and evaluation of impact over this period. These papers are the only longitudinal studies shortlisted for this review.
- Kennedy and Gruber (2020) build on the ACRL IL framework, using the Problem-Solving Analysis Protocol (Steinke & Buresh, 2002).

5.2.3 Ensure integration and relevance of the intervention

Ahmad et al. (2020), Cheuk (2008), Craig and Corrall (2007), Crawford (2013), Cullen et al. (2011), Hopkins and Julian (2009), Squibb and Mikkelsen (2016)

It is well known that IL is context dependent (e.g. Forster & Omar, 2019; Lloyd, 2007), so it follows that IL instruction/interventions must be integrated into their contexts. The following shortlisted papers clearly respond to this:

- Ahmad et al (2020)'s study is of one of three considering the workplace. These authors recommend twice-yearly 'practice-based' IL interventions. Craig and Corrall (2007) agree that IL training needs to be built into work, while Cheuk (2008) uses an example of a workplace IL intervention to advocate integration with knowledge worlds. For Cheuk, interventions can be made relevant by making them useful, such that they enable participants to learn (rather than being taught or commanded).
- Crawford (2013) calls for focus on specific topics such as health, finance, employability, while (Cullen et al., 2011) call for embedding IL education in the curriculum.
- Hopkins and Julian (2009) report on an integrated intervention that lasted through undergraduates' degree programmes, but varied according to their academic disciplines. Hence these authors found that IL teaching needs to be relevant, taking in what students already know. These authors also suggest that IL teaching needs time for both delivery and for it to take root, and that interactive, in-person teaching helps.
- Squibb and Mikkelsen (2016) also advocate embedding IL instruction in courses.



5.2.4 Impact requires collaboration between stakeholders

Crawford (2013), Lee et al. (2020), Middleton (2005)

While it is clear that collaboration between IL intervention workers and others will be needed to integrate IL interventions into workplaces and teaching, the following papers provide a little detail of how this might be done:

- Crawford (2013) advocates collaboration around national policies.
- Lee et al (2020) state that training and support to use government websites requires collaboration with local libraries, civil society organizations, information agencies, and data scientists. Such training could well need to be domain-specific.
- Middleton (2005)'s collaboration included embedding of teaching, i.e. collaboration between lecturers and library staff. They noted that many factors are outwith these workers' control.

5.2.5 Design of content and delivery methods

Auberry (2018), Daugherty and Russo (2011), Howard and Gill (2005), Kennedy and Gruber (2020), Maranda et al. (2016), Olaopa (2017), Seifi et al. (2020)

Few of the papers that aimed to describe interventions gave detail of content and delivery methods that would enable repetition of these interventions. Exceptions included the following:

- Auberry (2018) calls for use of delivery frameworks such as RADAR: relevance, authority, date, appearance, reason for writing (Mandalios, 2013). Unfortunately, Auberry does not report any impact data to back up this call.
- Daugherty and Russo (2011) provide thorough details of their intervention in an annex⁵.
- Howard and Gill (2005) call for 'well-designed tutorials'.
- Kennedy and Gruber (2020) advocate service learning, in which 'students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility'.
- Maranda et al. (2016) give detail of an intervention for first-year medical students that includes three online modules, three in-person classes and a project about therapeutics. This is followed up with a second-year project involving a literature review.
- Olaopa (2017) notes the need for visually impaired learners to have access to appropriate material (braille, audio-books etc). In their clear absence in his research geography (southwest Nigeria), such learners suffer from low IL.

A further factor around design and delivery is the way people prefer to learn, seen in the statement by Seifi et al. (2020) that older Iranians are used to learning by rote rather than understanding. Hence these authors imply that it will take time to deliver IL outcomes. Their training for use of public libraries has a curriculum of basic library skills; recognition of a need for information skills; information sources skills; skills of Internet searching and knowledge of resources; skills of databases and library searches; search skills of evaluating information and sources; and referencing and ethical skills

⁵ <https://ars.els-cdn.com/content/image/1-s2.0-S0099133311000747-mmc1.doc>



5.2.6 Success depends on repetition and follow-up

Ahmad et al. (2020), Y. H. Chen (2015), Cullen et al. (2011), Daugherty and Russo (2011), Kennedy and Gruber (2020)

Several papers state or imply the need to repeat or reinforce the effects of IL interventions, or at least to check whether any impact outlasts the end of the intervention. There is evidence that IL skill soon fades without such support. For example:

- Kennedy and Gruber (2020) advocate delayed post-testing as well as simple pre/post testing.
- Ahmad et al. (2020) call for workplace IL training programmes to be conducted at least twice a year.
- Y. H. Chen (2015) built on the Technology Acceptance Model (Davis et al., 1989) and the information systems success model (DeLone & McLean, 2003) to investigate semester-long training in use of a university library portal. Perceptions (ease of use, usefulness, information quality, system quality, service quality, satisfaction) and actual use had all increased by the end of the intervention, but 3 months later only use of the portal remained at an increased level.
- ‘memory-fade’ was also found by Cullen et al. (2011), and by Daugherty and Russo (2011) who note that of the skills taught in their intervention, evaluation skills are the ones that are lost.

5.2.7 The importance of management buy-in and budget

Ahmad et al. (2020), Cheuk (2008), Craig and Corral (2007), Doney (2006), Hopkins and Julian (2009), Markless and Streatfield (2017), Seifi et al. (2020)

The following papers show the need for support from management, and either tacitly or explicitly comment on the budget required for interventions. For example:

- Ahmad et al. (2020) tacitly state that developing an innovation ‘mindset’ needs investment in information-handling capabilities. For example SME executives ‘should critically evaluate their awareness of the organizational information landscape’, while enabling their organisations’ information capabilities.
- Markless and Streatfield (2017) also note the role of leadership in delivering evaluation of impact, but are concerned that library leaders may be biased towards providing services and activities rather than setting impact objectives.
- In Cheuk’s (2008) example of introduction of an information system in a large environmental consultancy, the foundational step was obtaining senior management buy-in, not least in the form of budget to implement the intervention. This enabled the consultancy to (1) find a relevant use-case (in this case, reducing the consultancy’s carbon footprint); (2) recruit, educate and empower knowledge champions; (3) introduce all staff to the new system; (4) ensure the information system was integrated with staff ‘knowledge worlds’, so that it was seen as a starting point that is integrated with other corporate systems; (5) implement ongoing training and consultation around further development of both the system and staff; (6) implement ongoing engagement to recognise and fix issues; (7) recognise that simply instructing people to follow new practices is ineffective.
- Craig and Corral (2007) also show the need for senior management buy-in, not least in supporting relevant testing.
- Doney (2006) notes the importance of senior management buy-in and budget: her programme would not have happened had her head of nursing not asked for it and provided funding.
- Hopkins and Julian (2009) also note the need for buy-in from management and other stakeholders.
- Seifi et al. (2020) show that development of IL requires societal change, which might be seen as ‘societal buy-in’, and funding/infrastructure.



- Uzuegbu (2019, p. 92) notes a form of senior buy-in in that a village chief banned deforestation activities 3 months after Uzuegbu's intervention, having learnt of the implications from one of his cabinet members who took part in the intervention. This can also be seen as further evidence that 'work-based' IL can be collaborative (Cruickshank, Hall & Ryan, 2020).

5.2.8 External factors

Hirvonen et al. (2016) show that, in the case of Finnish young men called up for national service, lower everyday health IL (EHIL) scores are more likely among men over 18 years old, those engaged in or having completed compulsory or vocational education, not studying, and having a father in a manual labour occupation. Similarly, those who were physically inactive or had certain unhealthy aspects to their lifestyles also had lower EHIL scores. The reverse relationship was also found, i.e. those with low EHIL scores were less likely to engage in health-promoting behaviours. Hence it may be that EHIL is both a cause and a benefit of health. However, Hirvonen and colleagues are careful to note that the direction of causation was not proven in their research.

6 Conclusion and next steps

The review of the literature has found evidence of inconsistent impact assessment with poor use of evidence. This is despite thorough work by several authors towards a roadmap for those willing to assess IL impact, but not knowing where to start.

Overall, there is a dearth of IL research associated with impact assessment outwith the educational and library contexts. More research into workplace, everyday, health, and citizenship IL impact is needed. Another significant gap is the world away from Europe and the Americas. This may reflect a weakness in the literature search approach, and there may be a range of publications in other languages. However, given the wide scope of the search carried out, it is also likely to reflect real gaps in past research.

It is already well recognised, for instance in Markless & Streatfield (2017), that the future of IL impact evaluation is open, and likely to be shaped by external demands and recent developments. Measurement of IL impact will be most urgently needed in the area of misinformation and disinformation management. These authors call for more systematic and theory-based approaches to impact evaluation, acknowledging that there is a long road ahead for IL impact (Markless & Streatfield, 2017, p.106). Their assertions are consistent with the results of this scoping review, which suggests that the components of impactful IL interventions are:

- evaluation should be around effectiveness and outcomes
- choice of clear frameworks and structures to measure impact
- ensuring integration and relevance of the intervention
- collaboration between stakeholders
- design of content and delivery methods
- repetition and follow-up
- management buy-in and budget.

Indeed, in this scoping review, it was found that more could be done to shape the impact assessment of IL interventions globally. Comprehensive impact assessment initiatives appear to be rare, and it is difficult to glean best practice guidelines from the extant literature.

It is proposed that the IL impact framework sketched above should be developed, taking into account the contextual and methodological differences found. This should be inclusive and flexible enough to be applied across a variety of settings, and begin to establish methodological and conceptual standards



for IL impact assessment by drawing upon a wide range of resources (LIS literature; impact assessment standards and models from other disciplines). The clear next step would be testing and validation of the draft framework, using institutional case studies and/or with reference to recognised works on development of impact, including Meyer et al.'s (2009)'s Toolkit for the Impact of Digitised Scholarly Resources (TIDSR), Verwayen et al.'s (2017)'s Impact Playbook and Tanner's (2016)'s Balanced Value Impact (BVI) model.

It is hoped that development of future work will be in co-operation with MILA.

Meanwhile, plans for completion of this project are:

- (1) Presentation of findings at CILIP's annual conference
- (2) Publication of findings in *Journal of Information Literacy* and/or a CILIP professional journal, including recommendations for best practice.

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Appendix: Shortlisted papers

Table 3: shortlisted papers

Reference	Title	Geography	Context	Method of study
(Ahmad et al., 2020)	The impact of workplace information literacy on organizational innovation: An empirical study	Europe	workplace	quantitative
(Auberry, 2018)	Increasing students' ability to identify fake news through information literacy education and content management systems.	Americas	education	none
(L. C. Chen et al., 2014)	The Effects of Inquiry-Based Integrated Information Literacy Instruction: Four-Year Trends.	Asia	education	qualitative
(L. C. Chen et al., 2017)	The effects of inquiry-based information literacy instruction on memory and comprehension: A longitudinal study	Asia	education	quantitative
(Y. H. Chen, 2015)	Testing the impact of an information literacy course: Undergraduates' perceptions and use of the university libraries' web portal	Americas	education	mixed
(Cheuk, 2008)	Delivering Business Value through Information Literacy in the Workplace	Europe	workplace	qualitative
(Craig & Corral, 2007)	Making a difference? Measuring the impact of an information literacy programme for pre-registration nursing students in the UK	Europe	education	mixed
(Crawford, 2013)	Value and impact	Europe	library	mixed
(Cullen et al., 2011)	Evidence-based information-seeking skills of junior doctors entering the workforce: an evaluation of the impact of information literacy training during pre-clinical years	Oceania	workplace	mixed
(Daugherty & Russo, 2011)	An Assessment of the Lasting Effects of a Stand-Alone Information Literacy Course: The Students' Perspective	Americas	education	quantitative
(Doney, 2006)	Evaluating the impact of a project promoting library and information services to primary care in Nottingham, UK.	Europe	health	quantitative
(Forster, 2013)	Information literacy as a facilitator of ethical practice in the professions.	Europe	everyday	qualitative
(Hirvonen et al., 2016)	Everyday health information literacy in relation to health behavior and physical fitness: A population-based study among young men	Europe	health	quantitative
(Hopkins & Julian, 2009)	An evaluation of an upper-division, general education information literacy program.	Americas	education	qualitative
(Howard & Gill, 2005)	University of Leeds: impact of information literacy initiatives.	Europe	education	mixed



Reference	Title	Geography	Context	Method of study
(Kennedy & Gruber, 2020)	Critical Thinking in a Service-Learning Course: Impacts of Information Literacy Instruction.	Americas	education	quantitative
(Lee et al., 2020)	The effects of information literacy on trust in government websites: Evidence from an online experiment	Asia	citizenship	quantitative
(Maranda et al., 2016)	Evaluation of the Long-Term Impact of a Curriculum-Integrated Medical Information Literacy Program	Americas	education	quantitative
(Markless & Streatfield, 2017)	How can you tell if it's working? Recent developments in impact evaluation and their implications for information literacy practice.	Europe	library	none
(Middleton, 2005)	Northumbria University: impact on improving students' confidence and competence in information and IT skills.	Europe	education	mixed
(Olaopa, 2017)	Information Literacy Skills, Alternative Format Availability and Information Sources Utilization by Visually Impaired Secondary School Students in South-West, Nigeria.	Africa	education	quantitative
(Petрак et al., 2008)	Information literacy in continuing professional development of medical practitioners: a Croatian example	Europe	education	quantitative
(Seifi et al., 2020)	The effect of information literacy instruction on lifelong learning readiness	Asia	library	quantitative
(Squibb & Mikkelsen, 2016)	Assessing the Value of Course-Embedded Information Literacy on Student Learning and Achievement.	Americas	education	mixed
(Streatfield & Markless, 2008)	Evaluating the impact of information literacy in higher education: Progress and prospects	Europe	education	none
(Uzuegbu, 2019)	Impact of tailor-made information literacy provision on rural dwellers' participation in sustainable development targets in Nigeria:: Implications for public library services to oral societies.	Africa	everyday	mixed