

Information Literacy (IL), supervising and research

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1. Introduction

Today universities and colleges spend considerable sums on electronic resources that give access to knowledge in all fields of study. We now have boundless access to all the knowledge in the world via electronic resources, and the cost of the technical equipment, updates, maintenance and subscriptions needed to access these resources is steadily rising.

Access to international databases is necessary to carry out work on the international research front. The resources are there, but what we are lacking today is adequate skills in accessing, using and evaluating all this knowledge. We must therefore train users – i.e. researchers – to be better at finding and evaluating the knowledge that is available.

For this reason, we must invest more in IL training in the academy, from the beginner's level to the highest academic level, the PhD degree. At the basic level, most academic staff can contribute to IL training. At the PhD level, advanced use of knowledge and advanced training in IL are required. Academic institutions must therefore put more into IL training. By doing so, we will considerably increase research productivity and improve the quality of research.

This paper examines links between IL, research productivity, and research quality. IL has the potential to both increase productivity and raise the quality of academic research. At all levels of research and in all areas of IL, there must be close collaboration between faculties and libraries. It is important that research and the teaching of IL should be seen as the shared responsibility of faculties and libraries. All research training and teaching should be a common concern.

2. Focus on research supervision

Several conceptions and definitions of information literacy have become prevalent.

In the present article, which focuses on research and IL, I will base my account on the definition given in the Final Report of the American Library Association's Presidential Committee on Information Literacy which specifies that ' To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information' (1989). A researcher must therefore be able to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information in all the different stages of the research process. The libraries and the faculties must join forces to pursue this goal.

My account focuses on the manner in which access to information literacy may improve the quality of the research process and the research results at the universities. I will link my discussion on access to information literacy to three main actors: academic libraries, faculties and researchers. I will, in particular, focus on the role of the academic libraries in the dissemination of information literacy as these libraries have always been some of the most important disseminators of information literacy and its usage, as will in all probability be the case in the future. My discussion is based on my own research experiences within the field of the Humanities as a linguist and as Dean of the Faculty of Humanities at the University of Bergen. I also draw on my experience with and knowledge of the Arts Library at the University of Bergen.

The main focus of this account will be the research process at the master's level, and especially at the doctoral level, at which the perspective on the education of researchers is central. I will view the relation between the research process and information literacy in the light of a book by Mari-Carme Torras and Tove Pemmer Sætre called *Information Literacy Education: A process approach. Professionalising the pedagogical role of academic libraries* (Torras/Sætre 2009). Their book is central in this context as it promotes the professionalisation of the pedagogical role of the academic libraries with regard to education and research. Their suggestions will, however, to a great extent challenge the current role of the academic libraries and their staffs. The libraries and the employees themselves must, among other things, establish new relations with the academic and faculty staff and the academic communities.

3. Three central actors

It would be natural to link the discussion on the research process with emphasis on information literacy to three central actors: academic libraries, faculties and researchers.

3.1 The academic libraries

The academic libraries play a central role with regard to information literacy as they administer a great wealth of knowledge (books, periodicals, newspapers, pictures, documents, manuscripts, audio records, videos, electronic databases etc.). They disseminate large quantities of knowledge in addition to helping users to navigate their way to the information needed among the sources they administer and have access to. The provision of help and services has always been one of the most important tasks of the academic libraries. The academic libraries help the researcher to navigate his or her way around the great wealth of knowledge in order to find the information required. The libraries have always been knowledge centres in which to search for and retrieve information, as is the case today.

Torras and Sætre (2009) argue for a change with regard to the role of the academic libraries. These libraries should not only be depositories of knowledge where one has access to knowledge and where researchers are given advice on how to find relevant pieces of information, but also places where students may apply knowledge and work on scientific texts. The libraries must become study centres, learning centres or learning arenas. This particular facility has been developed many places in that students and young researchers work at the libraries in the immediate vicinity of the sources. Torras and Sætre do not focus merely on turning physical depositories of knowledge into learning arenas. They also believe that the academic librarians should not only provide services, but also be in charge of pedagogical tasks related to information literacy education, i.e. the teaching of access to and use of information literacy. Torras and Sætre would also like the academic librarians to function as supervisors for students in the research process. A professionalisation of the staff will be the result of training employees to be in charge of new tasks related to education and research. The professionalisation of the academic librarians is the goal of the book written by Torras and Sætre. The academic libraries are autonomous academically and administratively.

3.2 The faculties

The responsibilities of the universities are threefold; research, education and dissemination. This is the academic side of the universities. The faculties represent the academic side through departments and their respective academic communities. Information Literacy is a prerequisite for good and efficient research. Consequently IL must be available to students and faculty researchers at the level of departments and academic communities. The faculties consist of an administrative and an academic side. The departments represent both sides. The administrative side should support academic

activities including the promotion of Information Literacy. Presently the faculties – represented by the departments and various academic communities – lack sufficient knowledge of and insight into Information Literacy. Knowledge of IL faculty-wise is fragmented and unholistic. Today the faculties of the University of Bergen cooperate increasingly with the libraries in connection with introductory meetings for new students related to IL. Apart from these meetings the cooperation on the dissemination of IL is rather random. It is therefore necessary to strengthen the cooperation between the faculties and the libraries in this regard. This must be incorporated into the formal curriculum – as recommended by Torras and Sætre – the question is how.

3.3 The researchers

Research is carried out at different academic levels at the faculties. Papers are written at the Bachelor level (the first cycle according to the Bologna process). However, most of the research takes place at the Master's and doctoral levels (the second and third cycles) in addition to research carried out by permanent academic staff. In this particular context, the second and third cycles are topical, and the focus is therefore on the connection between the education of researchers and access to knowledge related to Information Literacy.

4. Research and research processes

4.1. Information researching and writing processes

Torras and Sætre look upon the research process as an overarching process incorporating information searching and writing activities (63 pp). Information searching is a process that intertwines with their writing process. The writing process is seen as phases of work from the choice of topic to the submission of an academic text (Dysthe et al. 2000:39). Torras and Sætre base their account on a model of the postgraduate research process in humanities and social sciences proposed by Handal and Lauvås (2006) (Torras and Sætre 2009:63pp). The model illustrates six phases: choice of topic, defining research question, reading/ data collection, draft writing, draft rewriting and editing and closure.

Choice of topic	Defining research question	Reading Data collection	Draft writing	Draft rewriting and editing	Closure
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Figure 1. Phases in the postgraduate research process in the humanities and social sciences (Torras and Sætre 2009:63)

Torras and Skagen (2006) show how the six stages of the information searching process, described by Kuhltau (2004:44), relate to writing activities – and other activities like reflecting on research ethics, evaluation of sources and referencing in the totality of the research process, as do Torras and Sætre (2009:65).

Information search process (Kuhlthau, 2004)		Writing actions	Other actions or strategies
Stage 1	Task initiation	Brainstorming Mind mapping Writing 'for thinking'	Reflecting on research ethics
Stage 2	Topic selection		
Stage 3	Pre-focus exploration	Annotated bibliography First outlines Project statement	
Stage 4	Focus formulation	Listing and structuring keywords	
Stage 5	Information collection	Draft writing Writing 'for presentation'	Critical evaluation of sources Referencing
Stage 6	Search closure	Conclusion writing Final writing up	Ethical use of sources Presenting one's work

Figure 2. Information searching and writing as intertwining processes in the student's research process (Torras and Sætre 2009:65)

These two processes are central in the totality of the research process. In addition to the above-mentioned partial processes there is another process, a process I term the scientific process.

4.2. The research process: Different stages, different actions and different parallel processes

Another way to describe the research process – rather than to look upon it as information researching and a writing process – is to emphasise the scientific operations of the research process. In my opinion, the scientific process may be divided into nine central phases: 1) Choice of topic, 2) choice of scientific approach/ model, 3) defining research question, 4) operationalisation, 5) choice of data, 6) collection of data/ building a corpus, 7) analysis of data, 8) collection

of analysis results, 9) presentation of research results, 10) dissemination of

The stages	Actions and strategies
1. Choice of topic	Reflections on and evaluation of research tradition
2. Choice of scientific approach/model	Reflections on and evaluation of paradigms
3. Defining research questions/ generating hypothesis	Formulation of main hypothesis and sub-hypothesis
4. Operationalisation	How to obtain answers to research questions/hypothesis
5. Choice of data	How to consider data
6. Collection of data/building corpus	Interviews, questionnaire, recordings, observation, written sources, etc.
7. Analysis of data	Qualitative or quantitative, statistics or interpretation
8. Collection of analysis results	Patterns and tendencies
9. Presentation of research results	How to obtain knowledge and insight
10. Dissemination of knowledge and insight	Presentation in different texts and media

knowledge/insight. See the description of these phases below (4.3).

Figure 3. The ten central phases into which the scientific process may be divided

We may thus propose three partial processes of which the totality of the research process is composed. The first process is the information searching process, the second is the writing process, and the third, which I will discuss in more detail below, is what I term the scientific process. All the different stages within each process depend upon each other and partially interact throughout the entire research process, as is the case with the three partial processes. Torras and Skagen (2007) have described the connection between the information

searching and the writing actions. My aim is to discuss the manner in which these three partial processes – the information searching, the writing process and the scientific process – interrelate.

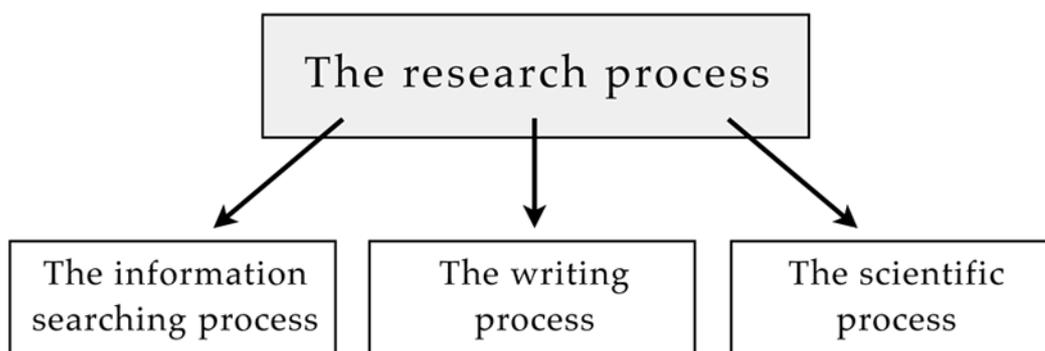


Figure 4. The three partial processes into which the totality of the research process is composed

4.3. The scientific process:

The presentation of this process will be illustrated by means of examples from the field of sociolinguistics.

1. Choice of topic

The choice of topic may be made based on personal interests, yet this choice is frequently based on international or national research traditions or the traditions of a particular field, the research environment or the research group to which one belongs.

2. Choice of scientific approach/model

In most fields and research communities certain approaches are prevalent. This is expressed explicitly or implicitly through a favoured paradigm or several prevalent paradigms in a particular community. These paradigms may be based on one or several scientific theories and the scientific practice which characterises the community to which one belongs. The paradigms are often expressed in specific models. It is often difficult to change the dominant paradigms of an institution or a field. Consequently, these paradigms are passed on to new students and researchers for generations.

3. Defining research question/generating a hypothesis

Research requires a clear hypothesis. It may be based on a main hypothesis. It may also be based on a main hypothesis and several sub-hypotheses or on one or several main hypotheses and many partial hypotheses. The research questions and the hypotheses are created on the basis of prevalent paradigms, models or theories in a particular academic community.

4. Operationalisation

A research question must be clear and explicit, and a hypothesis should predicate a case or a situation and should point to a direction. The way in which one attempts to obtain answers to a research question or test the hypotheses is called operationalisation. There are many demands related to what operationalisation should or ought to be, among other things the emphasis on validity (i.e. the fact that we are studying the phenomenon we are to study) and reliability (i.e. the fact that we can trust the information or the data we have access to).

5. Choice of data

After having decided how the research questions or the hypotheses are to be operationalised, one must choose which data to collect. This means defining what is to be considered data and what one should focus on, for instance with regard to informants (e.g. sex, age, education, profession, social group etc.), and whether these informants should be chosen based on random sampling, stratified sampling or whether the informants should be prototypical.

6. Collection of data/ building a corpus

The collection of data depends on the type of research question and the hypotheses proposed, in addition to the purpose of the investigation. Is one to use questionnaires with open or closed questions? , is one to use interviews? , is one to make recordings (audio or video)?, is one to employ observation (passive or participant)?, is one to use written sources or historical documents? These choices are connected to points 1–5.

7. Analysis of data

When data have been collected, the following analysis may either be qualitative or quantitative. Should one use statistical methods or should one resort to interpretation and hermeneutics?

8. Collection of analysis results

After having analysed research data, one is faced with several different analysis results. By establishing connections between these results one may discover certain patterns and tendencies that may throw light on the research questions.

9. Presentation of research results

After having analysed the data one must present these individually, in groups and in context. Which knowledge and insight have emerged from the research process, and which knowledge and insight have we gained access to?

10. Dissemination of knowledge and insight

The knowledge and insight brought by the research process are presented in dissertations, in articles, in popular science texts and in the media (newspapers, radio, television).

5. Supervision and supervision models

Torras and Sætre discuss the professionalisation of the academic librarians in terms of a pedagogical role and a supervisory role.

5.1. IL and education (pedagogical dissemination)

The pedagogical dissemination carried out by academic librarians should be process-oriented information literacy education in which the library practitioner is a professional and autonomous educator. This pedagogical professionalisation is based on the didactic relation model (33pp) proposed by Bjørndal and Lieberg (1978:135) in which the didactic categories are didactic conditions, learning goals, content, learning activities and assessment. This part of the professionalisation is very useful in connection with the dissemination of IL knowledge and by and large unproblematic with regard to the academic faculty staff. To let the academic librarians participate in supervision, would, however, lead to challenges in terms of academic insight, the sharing of supervision and the responsibilities related to supervision.

5.2. IL and research supervision

The academic libraries and the faculties must jointly disseminate IL in the research process at the doctoral level. It would be sensible to link this dissemination to the formal education of researchers and supervision in connection with the doctoral thesis. The challenge is to determine how the academic librarians and the academic faculty staff are to divide the tasks among themselves, how they are to join forces in the dissemination of IL and last but not least how they are to assist each other in the supervisory process.

5.3. The academic librarian supervisor and the academic supervisor

Sætre and Torras (2009) emphasise the information searching process (64–67) and the writing process (67–68), and the way in which these two processes are closely connected. Writing activities must be central during the entire research process (Dysthe et al. 2000). Writing helps the student to formulate, register, develop and structure thoughts. Thus writing at the post-graduate research level must be process-oriented with emphasis on both writing for thinking and writing for presentation. Writing for presentation leads to more elaborated texts written for others. When writing such texts, the student needs more specific information, more specialised searches and must access more specialised databases. It is during the writing of such texts that the academic librarian is to facilitate the in-depth searching process. The library supervision is to contribute to the development of the student's ability to use information sources in his or her own writing (cf. McNeely and Wolverton) .

Torras and Sætre (2009:70) state that:

The academic supervisor and the academic librarian may decide that the librarian will be entirely responsible for promoting certain skills such as selecting information, paraphrasing, referencing, while the academic supervisor will be entirely responsible for other skills such as developing and supporting arguments. They may further decide that they can both work jointly on promoting some other skills. For instance, in terms of using terminology correctly, the librarian can help the student identifying concepts in her research question and find background literature to define and relate them. The academic supervisor can discuss with the student whether her choice of terminology is adequate and consistent with the theoretical background the student has chosen.

Different supervision models and roles are proposed based on these ideas.

5.4. Supervision models

Torras and Sætre emphasise the fact that the librarian should be capable of playing a multiplicity of roles – each of which is characterised by different supervisory strategies. They present three supervisory models and strategies:

☐ *The academic librarian as counsellor (72–76)*

The librarian should be process-oriented rather than source-oriented. A counsellor role will entail the identification of appropriate sources, dialogue with the student, customised counselling etc. In this manner the supervisor becomes a 'writing coach'. The task goes beyond the location of information to identifying problems.

☐ *The academic librarian as process-oriented supervisor (76–81)*

Torras and Sætre's account based on Handal and Lauvås (Lidén 1998) – recommends that the academic librarian's supervision should be a process supervision mainly. The academic supervisor, on the other hand, should alternate between process and product supervision.

☐ *The academic librarian and supervision as a social practice (81–85)*

This role is based on the view that supervision is a social process. The emphasis is on group supervision and dialogue. Through the creation of library workshops the student will experience the plurality of voices (cf. Dysthe et al. 2006).

5.5. Librarian supervision and the academic process

Torras and Sætre's suggestions regarding the dissemination of IL knowledge and insight through the inclusion of library staff in research are very interesting. The linking of IL dissemination and the research process are appropriate with regard to two of the processes included in the totality of the research process; the information searching process and the academic writing process, and may be taken care of through the three supervision models and

roles. The third process – the academic process – is, on the other hand, a challenge as it does not fit into the three supervision models proposed. The reason is that the supervisor in charge of this partial process must be an expert in a particular field. In order to see this process through in a fruitful and creative manner one must have in-depth knowledge of relevant theories and methods and great insight into parallel and related contemporary and past studies. One must also be capable of evaluating operationalisations with regard to validity and reliability within the field. An academic librarian would seldom be able to assume this role.

6. The importance of IL capital for future research

IL capital – a term based on Bourdieu's theories – has become increasingly popular and important with regard to future research (cf. Bourdieu 2010). It has an impact on both the quality of the research carried out and the pace according to which students complete their degrees. The large quantity of knowledge available today is so overwhelming that experts are needed in order to navigate around it and to evaluate its quality, relevance and usefulness. A professionalisation of the library staff with regard to pedagogical qualifications and insight into research would be a sound way to meet this need and would also be an important investment – personally and financially.

In this context it is important to divide the research process into three partial processes: the information searching process, the writing process and the academic process. The library staff may easily take part in the first two processes. The third, however, is a challenge. The faculties and libraries must join forces to meet this challenge.

It is vital that research students at the master's and doctoral level have access to relevant and extensive IL capital. In this manner the quality of the research will improve, more students will complete their degrees and more degrees will be completed on time. The faculties must solve these problems in close cooperation with the libraries by supporting a professionalisation of the library staff as far as pedagogical and research skills are concerned. This professionalisation should include the participation of the faculties and the academic communities.

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