Information literacy and information seeking
A web-based tutorial for adult public library users

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Abstract

The application developed in this project is a prototype of web-based tutorial on information seeking and information literacy skills, designed for adult public library users. Its purpose is to respond to the need of broader user education on information literacy skills which seemed to be lacking in public libraries, even though guidance on technical information seeking skills does exist. This tutorial addresses both kinds of skills but the emphasis is on critical approach rather than search technique. The project is based on a review of already existing research on information literacy education and observed lack of such education for adults in public libraries. The prototype is placed speculatively into the context of public libraries in the Helsinki area in Finland, but the aim is that it could be developed further and adjusted to other relatively similar public library contexts. The tutorial is intended to be used primarily as an independent learning tool, although it could be used also in taught sessions.

Keywords: information literacy, information seeking, public library, user education, tutorial, web design

Ämnesord: informationskompetens, informationssökning, folkbibliotek, användarundervisning, handledning, webbdesign
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1 Introduction

This report provides a description and a critical review of different aspects of the application development project undertaken. Firstly, it discusses the background and theoretical framework in which the application was developed. Secondly, it describes the design, implementation and evaluation of the application. Finally, it presents the conclusions drawn as well as suggestions for future work in the same field.

1.1 Description of the project

The application developed in this project is a web-based tutorial which has been designed for adult public library users. Its aim is to provide users with guidance on information literacy and information seeking in digital environments. The application presented here is intended as a prototype which could, with appropriate adjustments, be developed into actual learning tools for different public libraries and their users.

Despite being a prototype, the work presented here has been designed with a specific context in mind as it would have been quite problematic to do this in complete isolation from any authentic environment. Moreover, the idea of some universal model of information literacy is in itself questionable (Pilerot and Lindberg, 2011). Acknowledging the problems of separating the abstract concept from real contexts, this project makes no attempt to create a model which is ready for use as such. It is rather a ground for possible further development. The fact that this tutorial has been designed with a specific environment in mind is clearly visible in some parts: many pages contain context-specific material such as links to authentic library and information services. However, these are easily adjusted to other environments which are fairly similar to the speculative context chosen for this project.

The context used in the work presented here, the Helsinki area in Finland, has been chosen because of my own familiarity with the region and its public library services – both as a user and as a former employee. The urban region in question has a diverse and large population who are all potential users of local library services and also potential users for this tutorial. The public libraries in Helsinki and its neighbouring cities have a common library system and catalogue: the entire collections of the city libraries in the area are accessible to users with the same library membership. However, public libraries in other areas in Finland do not share the same system. Additionally, the demographics – which determine the potential user groups – vary according to region. Therefore this version of the tutorial could not be used in Finnish public libraries outside of the Helsinki area without some adjustments. For public libraries in other countries, even more modification would be required before the tutorial would become relevant to their users. Accordingly, the limitations for the possible use of this prototype tutorial have to be acknowledged: it would probably be most beneficial in Finland and other Nordic countries, perhaps also elsewhere in Europe.
Overall, this project was motivated by my personal interest in the subject matter. Information literacy, user education and digital resources, the role of public libraries in society as well as adult education and lifelong learning are all current issues touched upon by this project.

Many questions were raised alongside the process of developing this application. The evaluation of the project would be a good starting point for any future work on the subject of teaching information literacy skills to adult public library users in the new information environments brought about by recent technological developments. The structure and content of the tutorial, as well as the challenges faced due to its rather ambitious nature, will be discussed in more detail later.

1.2 Relevance to society and digital library research

The significance of information literacy is highlighted in a situation in which an increasing amount of material is freely available on the web. Although the skills to find relevant information, process, use and critically evaluate it are equally necessary when using traditional media, the digital environment in which information seeking increasingly occurs is much more complex. In addition, the new environment is also more user-oriented: information seeking facilities designed for independent use mean that contact with information professionals is not necessarily needed. Libraries of all kinds have to find ways of responding to this. As Schmidt (2007) notes, librarians' work is moving towards a more active role in providing guidance in the use of information resources. The role of information professionals is undergoing changes as library users' information seeking process has become more independent. In this context, providing access to content is not enough for public libraries as many of their users need also guidance in order to be able to use different resources effectively – both within the library and elsewhere. Public libraries have the potential to reach and serve many adult people who could benefit from user education on the subject of information literacy.

According to Brabazon (2008), even young university students have a tendency to uncritically rely on internet resources – at the expense of serious academic literature. However, students are usually provided with guidance on information literacy and information seeking as part of their education whilst the general public is not receiving such support, at least not to the same extent. Students attending higher education are often young enough to have used digital information resources from an early age. If they are struggling with information literacy, searching for material in digital environments may be even more overwhelming for older people who may not be so familiar with such resources. Many tutorials on information literacy have been designed for university students and there is much research conducted in academic library context (Sundin, 2008). The general public have been given less attention (Hall, 2010). In the Helsinki area, where the tutorial presented here is placed, advice provided on library website is restricted to technical information seeking skills (HelMet libraries, n.d.). Yet
Public libraries have a central role in providing access to information and culture and in supporting equality. Therefore, they should be able to assist users in their independent information seeking by providing them with guidance in the evaluation of online resources. This application development project aims to address the needs of an often neglected yet very significant group: adult public library users.

Information literacy and information seeking skills are relevant to all – including those who are currently outside of the education system or even working life. It is not exclusively an academic matter but part of basic citizenship skills. Information literacy is a political issue, directly related to democracy: it is recognised by authoritative organisations as a force enhancing the culture of participation and empowerment through learning worldwide. As the Alexandria Proclamation (IFLA et al., 2005, para. 2) states, information literacy “empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations”. Such definitions matter also in user education since they justify it: learning about information literacy could motivate people to develop their skills. As a concept, information literacy sounds rather academic but given its empowering nature, it deserves to become more widely known.

In public libraries, users are a very diverse group. Some of them are academically educated whilst others have lower levels of education, some are senior citizens whilst others have grown up using latest information technologies from an early age, and some have emigrated from another country to a new society which may be very different from the one they have left behind. For the latter group of people, context-specific user education could play a very important role in learning to cope with their new information environment. Lloyd et al. (2013) have studied the subject in the Australian context, pointing out that for refugees, information literacy skills adapted to the context of their new country advance social inclusion. This is a clear example of a situation in which public libraries could contribute to the ideals of equality and inclusion to be put into practice.

New phenomena such as social media present new opportunities and challenges. E-services make handling official matters such as taxation or social security easier but at the same time, exclude those without the means to access and skills to use these services. These are two examples demonstrating how the relevance of information literacy reaches beyond the academia and even beyond the public library context: not all information seeking occurs through library catalogues. The very concept of information literacy itself can be understood in terms of several related subcategories of literacies (Koltay, 2011; Lloyd et al., 2013). Along with the broadening of information outlets, the role of media has become an increasingly important area to address in research and education.

Equipped with knowledge and skills, users would not only gain the full benefit but also minimise the risks associated with electronic information resources. For those trying to
familiarise themselves with a new country, user education addressing the entire information landscape in all its complexity could prove invaluable help in settling in (Lloyd et al., 2013). Some older adult public library users may have suspicions towards new forms of media, especially if they are not familiar with them. By focusing on information seeking in the digital environments, this tutorial aims to counter any such prejudices.

The new electronic formats in which information can be presented force us to reconsider how to handle it. This is not only a question of technical skills but also of perceived quality and trustworthiness of e-resources. Francke (2007) has addressed this in a study how scholarly e-journals have had to establish themselves to be regarded as reputable resources in the academic context. The issue may be less pressing in the public library context, but not an insignificant one. Finding relevant and reliable information matters also outside of academia – though it is worth noting that those very qualities are relative and cannot be arbitrarily defined. With the help of appropriate learning resources, digital information services could reach new information literate audiences who are confident enough to use them and make informed decisions regarding a particular resource or content.

1.3 Purpose of the application

The tutorial is intended to be a prototype which can be adjusted to serve adult public library users in different contexts. Since this tutorial is meant to serve as a prototype, this project has not been completed in formal association with any libraries – it is of purely speculative nature. The contribution that this application development project aims to make is to set some foundation for further work, whether practical or theoretical. In the field of applied work, the basic structure of the tutorial could be used in versions customised for other public library environments and academically, the issues raised during the process help identifying possible areas for further research. Raising both practical and theoretical questions, this project serves a dual purpose. It aims to identify any particular issues which should be taken into account when designing tutorials providing such guidance. Eventually, learning tools which could be created based on this prototype should be helpful for those adult public library users who feel they need further assistance to cope with the information overload and new information seeking environments.

1.3.1 Learning outcomes

This information literacy tutorial has two learning outcomes:

1. Users will be able to search, find and use information in digital environments.
2. Users will be able to evaluate the information found, considering its quality, reliability and suitability to their own needs.
None of the components of information literacy exists in isolation from others. Consequently, there is some overlap between these two learning outcomes which is also reflected in the structure of the tutorial. The issues addressed are presented as interlinked but not in any fixed order since choosing a certain order would imply that some aspects of information literacy are more important than others or that they indeed could be treated separately.

1.3.2 Intended usage

The tutorial has been designed to be used primarily in independent learning rather than in any taught sessions with the library staff. The emphasis is on users' own motivation to learn new skills as well as further develop already existing ones. However, the idea of this tutorial as an independent learning tool does not undermine the role of information professionals in any way. Library staff would still be in a position to answer any questions arising around the themes introduced in the tutorial. Additionally, they could promote the tutorial to library users and provide them with some basic introduction to it.

In fact, making the application accessible to users could be quite a challenge to the information professionals: the potential users would have to not only find the tutorial but also the motivation to use it. These challenges have to be acknowledged. Obviously, a link to this learning resource should be placed on the library website. However, a simple link to the application might not reach all potential users, especially as the tutorial is targeted at those who could benefit of guidance in information seeking and information literacy skills. The paradox here is that discovering this learning aid would already require some skills – unless the library staff were really active in advertising it. This could be done through already existing channels: since libraries provide advice on technical information seeking and computing skills, information literacy could be introduced to users within the same context.

1.4 Problem formulation

A key issue in this application development project is to identify an appropriate approach to information literacy for this particular tutorial. The chosen target group is more challenging to cater for than more narrowly defined groups such as students – for whom information literacy tutorials are usually designed. Adult public library users are a very broad and diverse set of users. Accordingly, their information needs and social backgrounds vary considerably. For the purposes of this project, it is important to identify issues which concern the majority of the target group as well as those that distinguish adult public library users from university students. If previous information literacy tutorials have been designed for different groups in different contexts, they might not be directly relevant to this project. Consequently, the following questions were considered alongside the application developments process:
1. How should information literacy and information seeking skills be taught to adult public library users?
2. What approach to information literacy should be taken when designing a tutorial for this group?
3. How should a tutorial for this target group be designed?

These questions were used as a ground on which this application was built. They were addressed at first by reviewing already existing research and designing the tutorial on the basis of earlier studies. Later, the outcomes of the evaluation conducted were used to answer these questions. Even though not all questions could be fully answered, they helped evaluating the success of this project and identifying areas for possible further research and applied work.

2 Theoretical framework

2.1 Information literacy

The two key concepts in this application development project are information seeking skills and information literacy. Both have been examined in library and information science previously, although there has been a shift of focus towards the latter, both in academic research and library practice. The former is related to the process of finding information whilst the latter is also concerned with the use of the information found. Despite their close connection and their equal relevance to this application development project, there is a distinction between technical information seeking skills and the broader set of skills called information literacy. The former is essential for the latter to develop but not enough in itself. However, as already stated, information literacy is no simple matter and there is some overlap between its components. It is not always easy to distinguish between skills and abilities which are so closely linked to each other. In this project, the empirical research and learning gained by reviewing previous academic work on the subject were used as a ground for applied work of speculative nature.

As a concept, information literacy can be defined from different perspectives, depending on the context and purpose of use. Pilerot (2014) identifies three levels on which the concept currently appears: it can be treated as a rather abstract term covering multiple issues, used empirically in reference to actual activities or theoreticised. This highlights the ambiguity the subject, as well as the problematic nature of any definitions. Therefore one has to be aware of the dimensions of information literacy which reach from practical uses to theoretical analysis. In the context of education or politics, information literacy can be either the aim in itself, or a means to an end, whilst in the research context, it becomes a concept used in its own right to enable theoretical analysis (Pilerot, 2014).

Whitworth (2014) has written an extensive study on information literacy as a political issue. The concept is not very old, yet information literacy has developed into an issue
with many dimensions over a few decades. Rather surprisingly, in the early usage of the term in 1974 by Zurkowski, no attention was paid to learning or agency, even though ideals such as free speech and rights motivated the introduction of the concept (Whitworth, 2014). This is quite far from the ideas of equality, empowerment and inclusion which now seem to characterise information literacy – at least in idealistic statements. Understanding of the subject has clearly broadened. Yet the ideals of inclusion and empowerment have not been fully realised.

Although the ideas of information literacy expressed by authoritative international organisations, such as UNESCO and IFLA through the Alexandria Proclamation (2005) described earlier, highlight values such as empowerment, equality and democracy through learning, it is worth bearing in mind that such definitions and declarations are not unproblematic. Pilerot and Lindberg (2011) have researched how information literacy is represented in policy-making documents, suggesting that the issue is very much context-dependent: what is relevant in the developed countries might not be so in the developing ones and therefore the same understanding of information literacy should not be imposed on the rest of the world. It seems that information literacy is not only difficult to define but also difficult to promote without full consideration of the specific environments in which this is being done. Yet some kind of shared concepts and practices are undoubtedly needed – otherwise it might become impossible to grasp. There are no easy solutions but it is crucial to be aware of the problematic nature of the subject. The contradictory demands of making universal claims and adapting them to particular environments are subject to problematisation when doing research or applied work on information literacy issues.

Despite the complexity of the subject, well-phrased definitions of the concept of information literacy have been made. The American Library Association's section, the Association of College and Research Libraries (ACRL) has defined information literate persons as those who “have learned how to learn” due to their familiarity with “how knowledge is organized, how to find information, and how to use information in such way that others can learn from them” and as those who are “prepared for lifelong learning, because they can always find the information needed for any task or decision at hand” (Introduction section, para. 3, 1989). The former statement manages to capture the idea of information literacy quite well. As such, it helps identifying areas to focus on when doing research or applied work on the subject – as long as the limitations and biases are acknowledged. The significance of context discussed earlier (Pilerot and Lindberg, 2011) has to be borne in mind.

Definitions are a useful starting point when planning user education, in this case a web-based tutorial for adult public library users. However, it is worth noting that they tend to be quite narrow. Hall (2010) points out criticisms of traditional definitions by the American Library Association as they do not pay much attention to the critical approach that information literacy should entail. Another important point to note is, once again, that the concept of information literacy is not necessarily universal and there is no single definition that could cover it entirely. Accordingly, there is need for research examining information literacy in its specific contexts: “universal” ambitions may lead to the
models created in the developed countries being imposed on those living in very different environments (Pilerot and Lindberg, 2011). This is worth bearing in mind when evaluating this tutorial and the possibility to modify it: the development of the prototype has been done with a specific context in mind, namely the public libraries in the Helsinki area. As such, it would require a considerable amount of modification as well as extensive empirical research to support the design process before it could be of any use outside of the Nordic or European context.

2.2 Information literacy and library profession

Information literacy is a relatively recent concept and it has been more closely linked to professional practice of librarians, particularly those working in university libraries, than to academic research in library and information science (Sundin, 2008). However, practical issues concerning librarians are certainly worth scholarly attention and theoretical analysis. In fact, it would be quite difficult to distinguish between the two perspectives in library and information science: as Wildemuth (2009) notes, library and information science as an academic discipline is closely related to professional practice. The subject of information literacy is an interesting mixture of practical librarianship and theoretical analysis. The different levels on which discourses around the subject occur highlight the multidimensional nature of the subject (Pilerot, 2014). All work conducted in this field has the potential to benefit information professionals, library and information science as well as society as a whole. If understanding of information literacy remains very abstract, it has little connection to actual education. The sociotechnical perspective highlights the significance of the social and contextual aspects of learning as well as the role of empirical research in gaining new knowledge about information literacy; it is interested in seeing how literacies develop alongside practices in working and learning communities (Tuominen et al., 2005).

2.2.1 Role of public libraries

Although information literacy has been studied from various perspectives, the question of the role of public libraries in reinforcing it has not received as much attention as it deserves. It is worth noting that even the concept of information literacy itself originates mainly from the academic library field (Sundin, 2008). Yet public libraries have a crucial role in providing access to information which, in turn, is related to broader issues in society, equality and democracy. Providing mere access without any user education is not enough, as mechanical information seeking skills do not imply actual information literacy. This highlights the importance of the subject for public libraries – despite the challenges that researchers will inevitably face. Public libraries are a much more challenging environment for user education than university libraries whose user groups are more restricted and less heterogeneous. Although the topic is by no means easy to examine, there is constant demand for further work in the area – both from scholarly and professional point of view. Hall (2010) raises this very issue and notes that in the
US context, public libraries have not been engaging in the discussion surrounding the subject – despite the relevance of information literacy to the mission of public libraries to serve their communities. Harding (2013) raises similar concerns about information literacy not being properly addressed by public libraries and notes that there has been shortage of research in the area – whilst the subject has been studied widely in the context of academic libraries.

Despite the previous focus on academic libraries, it seems that interest in information literacy and public libraries is increasing. Research in this area does exist and public libraries have also contributed to practical information literacy education in their communities. Crawford (2013) writes about the public libraries in the UK and US which have, together with other agencies, participated in projects offering disadvantaged groups much needed guidance in information seeking skills and information literacy. Some of the adult public library users could benefit greatly from public libraries taking a more active role in providing such user education since information seeking skills and information literacy are not only study-related issues but also necessary in everyday life. Furthermore, information literacy is a question of democracy, equality, participation and empowerment. Despite public libraries’ role in democratic society, such values are not always adhered to. Hedemark et al. (2005) have analysed discourses on public library users in the Swedish context, revealing attitudes which both create and maintain the gap between libraries and their users. Communicative and inclusive user education enables libraries to counter such problems.

There are a number of reasons for public libraries to try becoming more engaged in information literacy education. Harding (2013) names the strengths of public libraries as follows: they are traditional and already recognised places of learning, the values of public libraries reflect the idea of information literacy and librarians have the expertise required, public libraries serve a broad and diverse group of people, they have a central role in children’s learning and maintain often a lifelong contact with community members, they are able to provide individual instruction to users and form partnerships with various stakeholders and finally, they are the key providers of access to information. The shift of focus in library profession which was discussed earlier is also an issue here: in addition to access and facilities, users need instruction to gain full benefit from library services. Harding (2013) notes that public libraries around the world have been particularly good at providing IT facilities and access to the internet but librarians are also in a position to provide guidance in information literacy. Countering the digital divide has been on the agenda for public libraries since 1990s and much effort has already been made to provide equal access to computing facilities and the internet (Kinney, 2010). Information literacy education means taking these efforts a step further.

2.3 Teaching information literacy

Sundin (2008) has studied Nordic university libraries' tutorials and identified four distinct approaches: a source approach in which the emphasis is on different types of
sources and library collections, a behavioural approach which emphasises user's practical information seeking skills, a process approach in which the focus is on the user's information needs and the information seeking process and a communication approach in which the tutorials have moved beyond the limited focuses of other models, allowing room for social aspects and critical evaluation. According to Sundin's study (2008), tutorials on information seeking skills and information literacy differ in terms of their emphasis in several ways: some of them stress the role of information itself whilst others take a more user-oriented approach – and within the latter group, some are more interested in the individual, others in groups.

2.3.1 Changing perspectives

The four different approaches identified by Sundin's (2008) study clearly demonstrate how perspectives on information literacy have changed over time. Even though tutorials may, in practice, become mixtures of different approaches, their emphasis on aspects of the information seeking process varies greatly. Of the four approaches named by Sundin (2008), the source approach is concerned mostly with the collections and information itself, the process approach moves further by focusing on the user and the information seeking process as a whole whilst in the behavioural approach, the aim is to encourage certain patterns in the information seeking process. Despite their differences, the focus of all three seems to be still on finding information rather than using it.

More recently, increasingly complex teaching and learning methods have begun to emerge. The communication approach takes a quite different perspective and moves beyond the idea of information seeking as an isolated and individual process and moreover, it encourages the user to evaluate the validity of the information found, raising the question of cognitive authority (Sundin, 2008). The role of cognitive authority in our understanding of information literacy is an issue worth considering. The concept is linked to the perceived reliability of certain information, based largely on the reputation of scholars or institutions associated with it (Francke, 2007).

There has also been a change in the type of research undertaken – whether it is more practical or theoretical: traditionally, studies on information literacy have been professionally rather than scholarly oriented (Sundin, 2008). Yet the subject combines aspects of practical librarianship and theoretical analysis. This project touches both as it consists of applied work based on a review of previous academic research.

It is also worth noting that contemporary information literacy education should not be too limited, particularly when it is done outside of the context of higher education institutions – where narrower focus may be justified. For public library users, the scale of information seeking is broader, including various – and powerful – media outlets. Media literacy is a current issue in information literacy education. Koltay (2011) has reviewed the concepts of information and media literacies, which together act as components of digital literacy. It seems that user education is moving towards a deeper
and broader understanding of the skills required to cope in the new information environment. In the definition by the European Commission from 2007, the concept of media literacy is understood as having the means to access, understand and evaluate the media and content – as well as use them (Koltay, 2011).

2.3.2 Choosing an approach

The developments described above have been kept in mind when deciding how this tutorial is constructed, what is included and how it is structured. Even though this tutorial has been designed for public library users, the four approaches to teaching of information literacy in the academic context (Sundin, 2008) are still relevant here. Features of all four types can be identified in this tutorial, even though the process approach and communication approach do seem closest to this application: there is an entire section introducing resources and the tutorial provides guidance in technical information seeking skills, in line with the two more traditional approaches. However, the emphasis here is on the process. This tutorial is mostly concerned with the user as an individual and it aims to encourage independent development of skills. There is not much emphasis on social aspects, though social media and sharing content are briefly mentioned.

Mentioning of social media touches upon more general media issues. The components of media literacy, evaluation and usage discussed above (Koltay, 2011) seem very close to the definitions of information literacy discussed earlier. Hence they can be neatly included in any learning tools developed from the prototype presented here, either as a separate issue or incorporated into other material as this tutorial does. Media literacy perspective is included in this tutorial as it is closely linked to the idea of empowerment through literacy skills.

Despite the fact that one of the main sections was devoted to introducing potentially useful resources, users are under no obligation to restrict their information seeking to libraries or other “approved” providers of information services. The aim is to help users develop skills rather than teach them to repeat the same pattern in every single query. This is in line with the ideals associated with the subject taught: if information literacy is about empowerment, user education cannot consist of expert advice given from above. Instead, the focus must be on the user. Although information literacy education may involve recommendation of certain resources – as this tutorial does – it should not be uncritical of the perceived authority and presumed superiority of some information. Therefore this tutorial tries to emphasise skills to analyse the material that users come across when searching. The potentially useful resources are presented as suggestions rather than direct recommendations.
3 Design

This chapter moves from discussing theoretical background to the more practical part of the application development project. It reviews and describes the design process which includes identification of requirements as well as relevant contextual and technical considerations.

3.1 Process

Sharp et al. (2007) name four activities which should be done during the design process in order to maximise the usability and user-friendliness of the resulting application. The first activity is to identify the needs of the users, the second one is to develop alternative designs meeting the requirements set, the third activity is to develop these designs further into an interactive stage in order to enable testing and evaluation and the fourth activity is to constantly evaluate the application and the resulting user experience. For this project, there are time constraints limiting the possibilities of creating many alternative designs and testing the application on multiple occasions. However, the idea of interaction design as a process in which the product is under constant evaluation and re-evaluation was followed throughout the project – even though there was only a limited amount of time and resources to do this. Otherwise the application would have been at high risk of not meeting the requirements set and fail to serve its original purpose.

The empirical research done prior to designing the application involved reading earlier work on information literacy education. Areas on which this tutorial would focus on were identified based on the initial overview of the subject. Due to the highly speculative nature of this project, as well as time constraints, there was no extensive study on the potential users or the library context in which the application would be used. The tutorial was built on the information gathered in a rather theoretical way: by reviewing research literature and combining this with personal knowledge and observations about the context for which the work presented here was speculatively designed. Yet it seemed clear that there would be need for this kind of project: although there is much academic research and applied work done on the subject of information literacy, its relevance to public libraries has been too long neglected (Hall, 2010; Harding, 2013). Once the preliminary structure and content of the tutorial were clear, the application was tested and evaluated with the help of a person with relevant professional expertise. The evaluation process, its methods and outcomes will be described in more detail later.

There were some limitations to the design process in this project. The first one is concerned with technical and visual aspects: the website architecture takes priority over other aspects of design. Since this version of the tutorial is intended to be a prototype, its visual appearance is rather basic. The work presented here is more focused on the content and structure, making it possible to later customise the tutorial to suit different
contexts, needs and tastes. For example, audio-visual elements could be added where appropriate. Libraries could also add their logos or modify the colours and fonts to suit their websites and digital services. Another related issue which has not been addressed in this project is the relationship between the visual aspects of websites and pedagogy. If the tutorial was developed further for actual use, it would be important to consider how its visual appearance supports learning. Alongside with adjustments to specific contexts, this would be an area to explore if the application was to be used in an authentic public library setting.

3.2 Needs and requirements

Sharp et al (2007, 424) refer to one of the earliest stages of the design process as the “requirements activity”, the purpose of which is to help defining the particular requirements of a design project by first identifying its specific needs. In this project, both the needs and requirements have been considered in a heuristic manner, since the application has been created independently of any libraries or other interested parties. In this case, there was a need for the following:

1. A tutorial which is targeted for adult public library users.
2. A tutorial which supports independent learning.
3. A tutorial which can be used as a prototype, designed for a specific context but adjustable to others.

Accordingly, the three underlying requirements identified at the beginning of the design process were as follows:

1. The tutorial is generic enough to cater for a very diverse user group.
2. The tutorial encourages users to develop their independent learning skills.
3. The tutorial allows for modification so that it can be adapted to different environments.

3.2.1 Contextual and technical considerations

Requirements involve technical as well as contextual aspects: the consideration of the former helps creating a functioning design whilst the latter helps defining the framework within which the design is meant to be used (Sharp et al, 2007).

Carroll (1996) reminds of the central role of activity in application development: considering the actual usage and creating scenarios based on that provides some indication of the ultimate user perspective of a design. In this project, it was not practical to use very specific scenarios for two reasons: firstly, the tutorial developed is a prototype, not a design ready for use and secondly, the target group, adult public library users, is very broad and diverse. However, user perspective was considered
throughout the project and the application was also tested by a person not involved in the development process.

Adults are a challenging target group for designers of pedagogical applications. Adult users already have life experience, knowledge and skills that younger target groups do not yet have to the same degree. Adult users cannot be treated like children and therefore it is crucial that the language and expressions used in learning tools designed for them do not come across as patronising. It is important for libraries to reflect upon their attitudes towards users and avoid treating them as inferior (Hedemark et al., 2005). Whilst maintaining the educational role, this tutorial does not assume passivity on the part of the user. Accordingly, it tries to address the adult user as an equal and emphasise users' own realisation and learning – on the grounds of the skills they already have. It is intellectually challenging and approachable at the same time.

It is also worth noting that despite the library context, this tutorial avoids becoming too focused on the library environment. Its approach to information seeking and information literacy is emphatically not a pure source approach (Sundin, 2008). This tutorial provides its users with the option of exploring certain potentially useful and reputable information resources but the structure enables them to skip that part completely. Technically, it is possible to focus solely on the other parts which deal with skills rather than information resources. Where resources are introduced, they have been presented as mere suggestions rather than direct recommendations.

The part on potentially useful resources is very context-specific. However, it might not have been appropriate to incorporate specific advice regarding resources into this tutorial since the context used here is speculative without any formal co-operation with libraries. Therefore the pages introducing resources provide links to the content produced by libraries but do not cite or use any information available through the links directly. This approach was chosen for two reasons: firstly, to highlight the exchangeable nature of such information in this application and secondly, to preserve the originality of this project.

If the prototype was developed further and customised for different environments, examples given would be subject to modification. Hence the core of this application cannot be in pages containing exchangeable information. More effort has been put into teaching users relevant skills and helping them meet the learning outcomes stated earlier. This is clearly visible in the pages providing general information and advice on information literacy skills whose content is much more extensive and detailed.

The considerations described above were used as a ground for outlining the structure of the tutorial. They were helpful when deciding what to include on each page and how to approach the user. Overall, the application was designed with approachability in mind. Technically, this means basically a design which is not only clear and easy to navigate but also compatible with the devices and browsers that the users may have. In a
contextual sense, the issue is much broader.

4 Implementation

4.1 Encoding

4.1.1 Software used

The criteria used for selecting the tools were fairly straightforward: they had to be easily accessible, simple to use and enable their users to create functioning web pages. Additionally, there were compatibility issues to consider in order to make the application usable in a technical sense.

Initially, the tutorial was to be encoded using the markup language XHTML but this was changed to HTML5 in order to make the application more up-to-date. There were two reasons for choosing HTML5 for encoding over XHTML which had been used in the first drafts to write the code of this application. Firstly, HTML5 is the most recent version of the HTML languages (World Wide Web Consortium, n.d.a). Additionally, it is a more flexible markup language for web pages when compared to XHTML which requires much stricter adhering to the rules (World Wide Web Consortium, n.d.b). A CSS style sheet was included to define the appearance of the web pages. Only one style sheet was used as setting different styles for different pages could have made the tutorial confusing to the user. In order to make the tutorial easy to customise, the CSS is external. External CSS enables quick and easy adjustments of style and is also practical where no multiple style sheets are used for different pages (World Wide Web Consortium, n.d.c).

The code of the application was written with Notepad++ as an editor which was chosen for two reasons: it is an open source code editor and it is easy to use for creating web pages in HTML5. A more detailed description of the markup language HTML5 and the editor Notepad++ is available in Appendix 1.

4.1.2 Contextual and technical considerations

Choosing an appropriate markup language and elements involves consideration of compatibility issues. Due to the broad target group, it was important to try to make the application technically compatible with as many different browsers as possible. Users should be able to receive the full benefit of all the features of this tutorial from the computers available in the library – which may be of varying quality – as well as their own devices, as long as they are using the most common browsers. Consequently, not all new HTML5 elements could be used due to the lack of browser support. For example, the `<details>` tag which would have been perfect to show and hide the answers to the quiz questions was not used as it is not supported by two commonly used
browsers, Firefox and Internet Explorer (World Wide Web Consortium, n.d.d). This problem was resolved by using the `<iframe>` tag instead: answers were displayed as embedded web pages within a web page – perhaps an unconventional solution (Appendix 3.3). Otherwise browser compatibility was not an issue since HTML5 is very flexible and functions well with all major browsers – and it can be made to do so even with older versions (World Wide Web Consortium, n.d.e).

It is worth pointing out that the design of the application is fairly simple as it is meant to be only a prototype. The version presented here could be developed further into a more sophisticated one in which the new features of the HTML5 code were used to a greater extent. It is even possible to create multiple versions and design them specifically for certain kind of browsers or devices.

4.2 Structure

The tutorial is structured to reflect the aims and requirements stated earlier. The most significant areas to consider were support for users’ independent learning and room for context-specific alterations. In order to emphasise its focus on the user, the tutorial was organised so that users are free to follow it in almost any order they wish. It also allows for only partial completion. Easy and flexible navigation has been taken into account throughout the design. A visualisation of the structure (Appendix 2) shows how different parts of the tutorial relate to each other.

4.2.1 Main parts

The tutorial is divided into two sections which are entitled Useful resources and General information and advice, the former introducing different resources which the user may find useful and the latter providing general advice on searching, evaluating and using information (Appendix 3.1). This reflects the dual issue of information seeking skills as a matter of technique and information literacy as a set of other kind of skills and abilities. Inclusion of both was decided early on in the project, although several changes were made as the project proceeded.

The tutorial includes also pages with a more general function which do not fall into either of the aforementioned categories. In addition to the introductory and concluding pages, there is a site map (Appendix 3.2) as well as a page entitled About this tutorial which provides background information about the project and the author. This page can be accessed through a link placed in the footer of each page elsewhere. There is also a quiz which can be completed at any stage of going through the tutorial (Appendix 3.3). It consists of six open-ended questions designed to help the user to reflect upon what they have learned or already know and encourage revision where needed.

Both main parts, Useful resources and General information and advice are divided into three subsections. In the former, there is one page devoted to the library context where the tutorial is intended to be used, another page to external digital library resources and
one page to e-services. E-services were included to highlight the fact that information literacy and information seeking reach beyond the library context. All three subsections are linked to each other and can be viewed in any order. In the *General information and advice* section, the subsections were built around the three components named in the learning outcomes: finding, evaluating and using information. These subsections are more elaborate, including more text content than the pages on the other main part. Whilst only one page was devoted to advice on searching, the very complex issues around evaluation and usage of information were allocated two pages each. This reflects the emphasis of the tutorial on independent learning and information literacy skills. Similarly to the pages in *Useful resources* section, they were linked to each other and can be completed in any order chosen by the user.

4.2.2 Development and changes

Apart from the changes detailed below, the application remained true to its original architecture: the main parts on resources and skills persisted throughout the design process. However, three quite significant alterations were deemed necessary.

Firstly, the earliest outlines planning the structure of the tutorial attempted to present the pages in certain order. However, this seemed too traditional and would have forced the user to follow an arbitrarily defined order. In addition, if the content was presented in a fixed order, this would have implied that some sections are more important than others. The problem was resolved by creating a more flexible structure.

Secondly, in the early stages of the project, the subject was approached more from the angle of technical information seeking skills and examples of resources which could be beneficial to the user. This was reflected in the first outlines: the original draft structure of the tutorial seemed slightly uneven and too much emphasis was put on library resources and other “recommendable” sources of information. This was in direct conflict with the idea of user-oriented approach. In addition, the tutorial's understanding of information literacy came across rather narrow as it focused on finding and evaluating information whilst ignoring its usage. Consequently, one of the pages in the *Useful resources* part was moved to the other part *General information and advice*. Originally, the page covered a fairly obscure issue of using collections of free digital content but the focus shifted to skills concerning use of information.

The third major issue arising concerned the control questions which enable users to reflect on their own learning. Since it is possible to complete only some parts of the tutorial, it seemed at first logical that each part should have its own set of control questions. However, this would have made the structure even more complex and also less coherent. Hence the initially planned separate control question pages evolved into one common quiz with mixed-themed questions about issues addressed throughout the tutorial (Appendix 3.3). This change was intended to better connect different parts to each other and encourage users to go through the entire tutorial – even though its structure technically allows for free navigation and only partial completion. The same quiz can be accessed from each part and it can be completed at any stage – even at the
beginning immediately after the introductory pages: the main menu includes a text link referring to this option (Appendix 3.1).

5 Evaluation

5.1 Method

Evaluation was performed informally, not according to any fixed standard. This was deemed an appropriate approach as this project was concerned with setting foundations for future work, a prototype which could be subject to further exploration, not a design ready for use in an authentic library setting. The process consisted of three stages: testing, interview and analysis of the outcomes.

The tutorial was tested by a person who was asked to comment on it in a semi-structured interview. This qualitative method of gathering data was chosen for two reasons: firstly, because of its informal nature and secondly, because there was only one person testing the application. Despite being based on a set of pre-determined questions, a semi-structured interview is not as restrictive a method as a very formal structured interview but allows participants to interact more freely (Luo and Wildemuth, 2009). This makes it an appropriate method of gathering information when the number of interviewees is not very high. At the same time, the method is flexible and provides the interviewees with more room to express their ideas.

5.1.1 Testing

The person testing the application is a retired librarian who has work experience in guiding library users in the use of computer and information seeking facilities in a public library in the same context to which this tutorial was speculatively designed. Currently, this person volunteers for an organisation promoting IT skills for senior citizens. Due to relevant work experience with public library users, this person was considered to be able to assess the tutorial from the perspective of an information professional and evaluate its usefulness as a learning tool for adult public library users. If the tutorial was further developed to be used in an authentic library setting, it should be tested by a broader group of people, including information professionals and potential end-users from different backgrounds. However, the scope of this project was limited.

5.1.2 Interview

The interview was conducted during the testing process and it was loosely based on seven questions addressing two areas: the content and structure of the tutorial as well as its technical aspects. The following interview questions were given beforehand so that the person testing the tutorial could pay attention to relevant issues:
1. Is the tutorial relevant to the intended user group?
2. Is the concept of information literacy clearly explained?
3. Is the tutorial too easy or too difficult?
4. Is there something missing that should be included in the tutorial?
5. Is the tutorial easy to navigate?
6. Do all the links work properly?
7. Is the structure of the tutorial easy to follow or confusing?

The person testing the application was also provided with an overview of the project and had the opportunity to ask questions before starting to test the application. Once the person had gone through the entire tutorial, we discussed the questions listed above as well as other issues raised during the testing process. The tutorial was tested twice. At first the person testing it went through the pages independently but for the second time, this was done in parallel with the interview.

5.2 Findings

The questions listed above were discussed in an informal setting in a semi-structured interview. Notes were taken by me in writing during the discussion. After the interview, a written summary of our discussion was sent to the tester by e-mail for comments in order to ensure the accuracy of the record kept.

There was some overlap between answers to different questions: many of the issues raised were related to more than one of them. The questions about the relevance of the tutorial to the intended user group, the clarity of its structure and expression and how demanding it is to the end-user are all interlinked. It was pointed out that the role of language is very important. In places, the terminology used came across too formal and academic. For the tutorial to be usable, the concept of information literacy must be clearly explained and practical guidance in information seeking must be easily understood. It was discussed that the page about information literacy at the beginning of the tutorial requires more work: although its content is relevant, the language used is too academic which makes that part too heavy for a non-academic user. As a result, the texts on these pages were rephrased to better support users' learning.

As such, the content of the tutorial was not considered too difficult to the intended user group, although the tutorial is quite long and not quite so easy. For some users, it could feel overwhelming, regardless of its aim to make the subject of information literacy approachable. On the other hand, it can be completed one small section at a time which makes it more manageable. Also, if it was completed together with an information professional or some other person as a guide, the tutorial would probably be easier. However, the tutorial was considered suitable also for its original purpose as an independent learning tool. How challenging the tutorial is depends, of course, on users and their backgrounds. For some, the language and expressions used should probably be made much clearer. One option would be to use this prototype as the basis of creating multiple tutorials with more specific target groups.
The relationship and links between different sections of the tutorial were also discussed during the interview. It was noted that whether links work or not is not just a technical matter but part of designing a well-functioning structure. In a purely technical sense, all the links were already working during the testing phase. Especially links embedded in the text were considered helpful as they make navigation between different parts easier and clarify the overall structure. Also the site map enables the user to see each part in relation to others. However, it was pointed out that some of the pages were missing relevant links and this had to be fixed after testing. Consequently, the structure was confusing in places – especially when the person testing the tutorial saw it for the first time.

Another issue raised in the interview was the significance of the visual appearance of each page: for example, fonts, colours, headings and the layout in general contribute to the clarity and usability of the tutorial. It was pointed out that heading levels and size of the text made some pages rather confusing. After testing, these issues were fixed: heading levels were made clearer and the font size larger. Layout matters even though this is only a prototype.

Regarding the question about issues that should have been included, we discussed the significance of social media as an information resource. Not all use of social media is for entertainment purposes – it can be very beneficial even as a serious source. The appropriate use of these new facilities is an area where people do need guidance. The person testing the tutorial felt that this issue could have received more attention in the tutorial. Now it is briefly touched upon but not discussed properly.

6 Conclusions

In the early stages of the project, three questions were set: the first one is concerned with choosing appropriate teaching methods, the second one with selecting a suitable approach to information literacy and the third one with the design of a tutorial targeted at adult public library users. Regarding these three questions, the development process shed some light into issues around teaching information literacy and information seeking skills. However, instead of providing definitive answers, this project raised several issues for further consideration. Yet some conclusions can be drawn.

Firstly, it became clear that teaching information literacy to adult public library users is no simple matter. When designing pedagogical instruments for this group, issues such as diversity of users as well as the specific context in which the application is going to be used require extensive analysis. It is also vital that independent learning and professionally given guidance are in balance. On the one hand, education aiming for empowerment cannot be anything other than user-oriented. On the other hand, support of information professionals has to be available.

Secondly, the chosen approach to information literacy will have to reflect these principles. Of the four approaches identified in Sundin's (2008) study, the process and
communication approaches would seem very relevant – even though in practice, elements of others can also be found in this tutorial.

Thirdly, the design of this kind of tutorial should support the teaching methods and approaches chosen. Additionally, applications should be accessible to as many potential end-users as possible – both in a technical sense and otherwise. Information literacy tutorials seeking to encourage independent learning should be easy to use and navigate, have the appropriate level of challenge as well as be technically compatible with the devices used to access them.

The underlying purpose of this project was to create a prototype which could be used as a basis for further development of real information literacy tutorials in authentic library settings. Overall, the project managed to meet its aim and provides a model which could be customised for actual use. The testing results suggest that as a prototype, the tutorial is usable but it is clearly not ready for the intended end-users. It would still require a considerable amount of work and more research on specific contexts and requirements, possibly even development of multiple tutorials for subgroups within the rather broad group of adult public library users. Some users could perhaps benefit from learning tools targeted more specifically at them. Another possibility would be to change the focus from independent learning to usage in taught sessions. In all cases, there should be less speculation and more solid research supporting the application development process based on this project.

7 Further work

The work presented here has its limitations and is of speculative nature. It must be emphasised that this tutorial is still work in progress and should be treated as a ground on which new applications could be built, not as a design ready for use. As already noted, there was no analysis regarding the impact of visual aspects of design on learning and this would be one major issue to consider if the prototype was developed further. Nevertheless, this project has the potential to contribute to any future work which remains to be done in the field of user education on information literacy among adult public library users. A number of issues worth exploring through applied work or academic research were raised during the process.

Firstly, there is the question of context. One area for further study would be the adaptation of ideas of information literacy and teaching practices to different environments. This problem is not easily resolved but at the same time, it cannot be ignored if information literacy is to be promoted globally (Pilerot and Lindberg, 2011). In this project, the problem was acknowledged but only partially resolved by leaving room for adjustments in the application. However, the issue touches virtually all work in the area – whether academic research and theoretical analysis or applied work.

Secondly, there is the challenge regarding the role of information professionals and public libraries in engaging their users in learning information literacy skills. Public
libraries have the means to provide user education and IT facilities but this is not enough in itself. If users are not motivated to use these facilities or if they simply lack the knowledge and skills to find them, tutorials supporting their independent learning skills are quite futile. Therefore any future development of this tutorial should be accompanied by a thorough analysis of the possible ways of promoting it to potential users: this could be done by surveying the ideas of users and staff alike. Scenarios and stories would also help developers determine how the design would eventually interact with its users and respond to their needs (Carroll, 1996; Sharp et al., 2007).

Thirdly, and more specifically to this particular application, there is the issue of addressing a very diverse user group. When testing and evaluating the tutorial, it became apparent that it might be too difficult for some of its intended users. An easy option would be to simplify it, although there are also other possibilities which would not require compromising the content too much. Adult public library users are perhaps a too broadly defined group and one solution would be to create more specifically targeted tutorials for different kinds of people within that group. However, the problem of defining a group persists: even if the target population was, for example, senior citizens or immigrants, those groups would still include people from very different backgrounds. If the idea of more narrowly defined target groups does not seem feasible, another option would be to develop this tutorial towards a new direction. If it is too difficult to be used independently, it could be used in taught sessions in which an information professional or some other educator was present. This would hardly require any major alterations to the structure of the prototype. It would still be important that users could navigate through the tutorial in any order they wish and focus on the parts they find relevant. The role of the library staff would be to support users' learning, not impose their own views on users or take a too library-centric approach. The ideal environment for teaching would be small group sessions in which each user would receive enough attention from the educator. In such setting, the learning and teaching process would inevitably become more social. With this in mind, the tutorial could be developed more towards the communication approach (Sundin, 2008).

8 Summary

The aim of this project was to create a tutorial for adult public library users. The tutorial was designed so that it allows for modification and can be adjusted to new environments – as long as they do not differ considerably from the context used here, the public libraries in the Helsinki area. Pedagogically, the tutorial was focused on its users' already existing skills and their own motivation to learn. The structure allows much freedom to the user and there are many possible routes to complete it. This application was designed to be used primarily as an independent learning tool, even though this learning does occur in a library context. However, during the testing process, the idea of independent usage was questioned as some users might need the support of information professionals. This is an issue to consider in any further development of this prototype. One option is to modify the tutorial and make it more simple so that it really becomes accessible to all users. Another option is to create different versions, some of which are more demanding than others or emphasise different aspects of the subject. It is also
possible to use this prototype to design tutorials for taught sessions held in public libraries.
References


Harding, J. (2013). Information literacy and the public library: We’ve talked the talk, but are we walking the walk? The Australian Library Journal, 57(3), 274-294.


Appendix: Technical and descriptive documentation

1 Software used

1.1 HTML5

The web pages were encoded using HTML5, the most recent version of HTML markup languages. A current HTML5 recommendation (World Wide Web Consortium, 2014) is available here: http://www.w3.org/TR/html5/.

1.2 Notepad++

The web pages were created using Notepad++, an open source code editor based on Scintilla, a free source code editing component. The writing of the HTML5 code of this application began with Notepad++ 6.7.8.1 (released in May 2015) but there were several programme updates during the process. A more recent version of the programme, Notepad++ 6.8.1 (released August 2015), was used when finalising the application. Full description of Notepad++ is available on the website of the project: https://notepad-plus-plus.org/.
2 Structure of the tutorial
3 Code

The tutorial is available online at: http://www.utb.hb.se/~s112569/ILtutorial/home.html

The complete code of the application consists of 25 HTML files and one CSS file, all created with Notepad++ editor.

Extracts of the code are shown below:

3.1 Main menu

```html
<!DOCTYPE html>
<html>
<head>
<title>Main menu</title>
<link rel="stylesheet" type="text/css" href="pages.css">
</head>
<body>
<nav>
<a href="../ILtutorial/home.html">Home</a><br>
<a href="../ILtutorial/menu.html">Main menu</a><br>
<a href="../ILtutorial/site_map.html">Site map</a><br>
<a href="../ILtutorial/quiz.html">Quiz</a>
</nav>
<section>
<h1>MAIN MENU</h1>
The tutorial is divided into two independent sections. You may complete them in any order you wish.
</section>
</body>
</html>
```
If you already feel confident about your information literacy skills or if you are just curious to find out how much you already know, you can try out a little quiz. The quiz can be completed at any stage of the tutorial and as many times as you wish.

3.2 Site map

![Site Map](image.png)
3.3 Quiz

Take this little quiz to test your information literacy skills!

Q: What is information literacy?

Q: What do you need to define before you begin searching for information about a specific subject?

Q: What are the differences between library catalogues and common search engines?
Q: What are the differences between library catalogues and common search engines?

Q: How can you narrow down your searches in order to find more relevant results?

Q: What should you consider when assessing a resource?

Q: What should you take into account when using something you found?

This tutorial is the Master's examination task by Anni Lehikoinen, Swedish School of Library and Information Science, University of Borås, 2015.

Click here for more information about the project.