



CHAPTER ONE

Origins and Concepts of Digital Literacy

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Introduction

The purpose of this chapter is to describe the emergence and development of the idea of “digital literacy” and to show how it relates to the various other “literacies of information.” This is a topic whose terminology is very confused. Among those authors who have tried to disentangle it are Bawden (2001), Bawden and Robinson (2002), Kope (2006), Martin (2006a, 2006b), and Williams and Minnian (2007). Not only must the idea of digital literacy find its place among information literacy, computer literacy, ICT literacy, e-literacy, network literacy, and media literacy, but it must also be matched against terms which avoid the “literacy” idea, such as informacy and information fluency. Indeed in some cases, mention of information or anything similar is avoided—particularly in workplace settings—as in “basic skills,” “Internet savvy,” or “smart working” (Robinson et al., 2005).

The Concept of Digital Literacy

The concept of digital literacy, as the term is now generally used, was introduced by Paul Gilster, in his book of the same name (Gilster, 1997). As will be seen later, Gilster did not provide lists of skills, competences or attitudes defining what it is to be digitally literate. Rather, he explained it quite generally, as an ability to understand and to use information from a variety of digital sources and regarded it simply as literacy in the digital age. It is therefore the current form of the traditional idea of literacy *per se*—the ability to read, write and otherwise deal with information using the technologies and formats of the time—and an essential life skill. This generic expression of the idea, although it has irritated some commentators, is one of the strengths of Gilster’s concept, allowing it to be applied without concern for the sometimes restrictive “competence lists” which have afflicted some other descriptions of the literacies of information.

Gilster was not the first to use the phrase “digital literacy;” it had been applied throughout the 1990s by a number of authors, who used it to mean essentially an ability to read and comprehend information items in the hypertext or multimedia formats which were then becoming available (Bawden, 2001). Typical of these is Lanham (1995), who regarded it as a kind of “multimedia literacy,” quite different from traditional literacy. His argument was that since a digital source could generate many forms of information—text, images, sounds, etc.—a new form of literacy was necessary, in order to make sense of these new forms of presentation. While this is certainly an important aspect of the wider concept of digital literacy, it is too restrictive, and arguably too much influenced by the technology of its times, to be of as much lasting value as Gilster’s broader conception. Several conceptions of this kind are reviewed by Eshet (2002), who concludes, like Gilster, that digital literacy must be more than the ability to use digital sources effectively; it is a special kind of mindset or thinking.

In his 1997 book, Gilster states this explicitly—“digital literacy is about mastering ideas, not keystrokes”—thus distinguishing his conception from the more limited “technical skills” view of digital literacy. It is, he says, “cognition of what you see on the computer screen when you use a networked medium. It places demands upon you that were always present, though less visible, in the analog media of newspapers and TV. At the same time, it conjures up a new set of challenges that require you to approach networked computers without preconceptions. Not only must you acquire the skill of finding things, you must

also acquire the ability to use these things in your life.”

The mention of “networked computers” is a reminder that Gilster’s book was written at the time of the first flush of enthusiasm for the Internet, and many of his examples and instances are Internet-related. In his introduction to the book, he sets the challenge of effective use of the Internet into the long sequence of adaptation to new information technologies beginning with the clay tablets of the Sumerian period: “technology demands of us, as it did of them, a sense of possibilities, and a willingness to adapt our skills to an evocative new medium. And that is the heart of information literacy. Our experience of the Internet will be determined by how we master its core competencies.” The casual reader might assume, as some did some reviewers of the book, that Gilster’s digital literacy and effective use of the internet were essentially the same.

This is by no means the case. Gilster states explicitly that “no-one is asking you to give up other sources of information just to use the Internet,” that “the Internet should be considered one among many sources of ideas in a technological society” and that evidence must be gathered from many sources, not just the world wide web, for the task of “knowledge assembly.” More than this, although he gives, as perhaps the single clearest explanation in the book, the idea that digital literacy is “the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers,” he allows that there are non-digital formats as well. He specifically noted that digital literacy involved an understanding of how to complement digital resources with such things as reference works in libraries, printed newspapers and magazines, radio and television, and printed works of literature, expressing a particular fondness for the last. While the inexorable shift to digital formats in the decade since his book appeared might make these qualifications and caveats seem less important than when they were written, it is important to note that from its first mention, Gilster’s digital literacy is not about any particular technology, not even—paradoxically, given the term—digital technology itself. It is about the ideas and mindsets, within which particular skills and competences operate, and about information and information resources, in whatever format. The term itself is quite reasonable in this context, since all information today is either digital, has been digital, or could be digital.

Gilster’s book does not give a particularly clear and coherent account of digital literacy itself, or of the skills and attitudes that underlie it; it is, rather, an impressionistic and wide-ranging account, which may lead to some confusion for anyone attempting to express the ideas within a structured framework,

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and to determine which are of primary importance; see Bawden (2001) for a discussion. Reviewers of Gilster's book were somewhat critical of this aspect, describing it as, for example, "not organised very well or very logically" (Nicholas and Williams, 1998) and noting that "useful information for the reader is scattered in bits and pieces" (Bunz, 1997).

Although there is nowhere in the book any specified list of skills, competences, etc. associated with the general idea of digital literacy, a list may be derived from the text (Bawden, 2001). In brief, this includes:

- "knowledge assembly," building a "reliable information hoard" from diverse sources
- retrieval skills, plus "critical thinking" to making informed judgements about retrieved information, with wariness about the validity and completeness of internet sources
- reading and understanding non-sequential and dynamic material
- awareness of the value of traditional tools in conjunction with networked media
- awareness of "people networks" as sources of advice and help
- using filters and agents to manage incoming information
- being comfortable with publishing and communicating information, as well as accessing it

Gilster summarizes these at one point in the book by suggesting that there are four core competencies of digital literacy: Internet searching, hyper-text navigation, knowledge assembly, and content evaluation. This list however seems to miss out some of the issues quoted at various places as significant.

Another aspect of the somewhat informal nature of the book's material is that there is no clear statement of whether any of the various aspects is central, fundamental or most important (Bawden, 2001). At various points, content evaluation and critical thinking is referred to as "most essential," "most significant" and "overarching." At other points, the ability to read and understand dynamic non-sequential information is cited as the basis for the concept. In still other sections it is the finding of information from various sources which is given priority.

This concept of digital literacy is plainly a very broad span, from specific skills and competences to rather general awareness and perspective. Developments in the decade since it was proposed, from the ubiquity of Google to the rise of social networking have validated the list as representing, in broad terms, the needed form of literacy for the present time.

Gilster's book, and the ideas in it, achieved relatively little impact in the years following its publication. Whether this was because of its idiosyncratic writing style, the fact that it appeared as a paperback, and reasonably "popular," book, rather than a journal article, or simply that the phrase "digital literacy" denoted—to those who had not read it—an exclusively technical approach, it is difficult to say.

Origins: Information and Computer Literacies

Gilster's idea of digital literacy did not appear "out of the blue." There was already a substantial set of literature and practical experience around the ideas of information literacy and computer literacy: for detailed accounts of the early history of these ideas, see Bawden (2001), Snaveley and Cooper (1997), and Behrens (1994), for accounts of later developments, see Andretta (2005, 2007), Virkus (2003), and Webber and Johnson (2000).

Both of these terms (together with equivalents such as "IT literacy") originated largely to describe sets of specific skills and competences needed for finding and handling information in computerized form. "Computer literacy" was the term mainly in vogue through the 1980s, with "information literacy" gaining popularity in the 1990s. The former term, still in use in some quarters, has for the most part retained its original and straightforward "skill set" implication, based on being able to operate commonly used software packages effectively. The latter has broadened its meaning, has been accepted as a multifaceted concept, and has been understood in various ways. The information literacy concept has been largely, though not exclusively, promoted by the academic library community. It slowly grew to take on a wider meaning than its original skills-based formulation, starting to encompass aspects of the evaluation of information, and an appreciation of the nature of information resources. Though still focused on computerized information, which was believed to be most problematic to its users, it grew to encompass the use of printed resources, and hence to overlap with such concepts as "library literacy" and "media literacy" (Bawden, 2001).

At a relatively early stage in the development of the concept, in 1989, the American Library Association promulgated a six-stage model for information literacy, which has had great influence. This regarded information literacy as comprising six aspects of a linear process of information handling:

- recognizing a need for information

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- identifying what information is needed
- finding the information
- evaluating the information
- organizing the information
- using the information

This still forms the basis for most approaches to information literacy to the present day, though much elaborated, extended, and refined, and with numerous variants differing in detail and emphasis. Usually this involves adding extra aspects, e.g., splitting “finding information” into “choosing resources” and “searching” and “accessing the items identified,” or adding aspects such as “communicating information,” or “storing / archiving / deleting information,” where they are important in a particular context. An example is the “seven pillars” model, developed by SCOUNL (Society of College, National, and University Libraries) in the UK (SCOUNL, 2006), which distinguishes the following seven aspects:

- recognize information need
- distinguish ways of addressing gap
- construct strategies for locating
- locate and access
- compare and evaluate
- organize, apply and communicate
- synthesize and create

This understanding of information literacy goes somewhat beyond the skills-based computer literacy model, by including softer skills such as evaluation of information and recognition of information need, but is still a rather prescriptive and formulaic approach, based upon the assumption of a formally expressed information need. It is also very much a model used for planning training courses in information literacy, and widely used for that purpose within academic libraries, also forming the basis for interactive tutorials.

During the 1990s, an alternative viewpoint emerged, although it never challenged the popularity of the “six stages” style of model. This viewpoint saw information literacy less as a series of competences to be mastered and more as a set of general knowledge and attitudes to be possessed by an information literate person. Notable is the set of seven key characteristics presented by Bruce (1994, 1997), such that the information literate person is one who:

- engages in independent self-directed learning
- uses information processes
- uses a variety of information technologies and systems
- has internalized values that promote information use
- has a sound knowledge of the world of information
- approaches information critically
- has a personal information style

An even broader approach is that of Shapiro and Hughes (1996), who envisaged a concept of, and curriculum for, a kind of computer literacy comprising seven components:

- tool literacy—competence in using hardware and software tools
- resource literacy—understanding forms of, and access to, information resources
- social-structural literacy—understanding the production and social significance of information
- research literacy—using IT tools for research and scholarship
- publishing literacy—ability to communicate and publish information
- emerging technologies literacy—understanding of new developments in IT
- critical literacy—ability to evaluate the benefits of new technologies (note this is not the same as “critical thinking,” which is often regarded as a component of information literacy)

Somewhat similar broad concepts, combining general knowledge and attitudes with specific skills have also been described under the headings of “network literacy” (McClure, 1994), “informacy” (Neelameghan, 1995), and “mediacy” (Inoue, Naito and Koshizuka, 1997). For comparisons, see Bawden (2001) and Bawden and Robinson (2002), but, in essence: the first focuses on digital information in networked form, and is synonymous with “Internet literacy”, the second implies traditional literacy, plus information literacy; while the third emphasizes an ability to deal with digital information in a variety of media.

It seems clear that Gilster’s digital literacy is to be located among these proposals; as a very broad concept, not restricted to any particular technology or form or information, and focusing on personal capabilities and attribute, rather than on any particular skill set. Its advantage over the others is its combination of the specific and the general, and (perhaps ironically) its lack of a

strong structure, so that it is a general concept adaptable to changing times and concerns. What Gilster wrote with examples of search engines, databases and mailing lists works just as well with examples of folksonomies and social media, social networking sites, and weblogs. The principles outlast the specific systems and technologies.

Developing the Theme

As noted above, for most of the decade following the publication of Gilster's book, the concept of digital literacy received relatively little attention, compared with the enthusiasm for the more prescriptively defined "information literacy," used as the basis for many training programs and tutorials, particularly in higher education. Some attempts were made to derive specific lists of competences from Gilster's conception for use in training programs (Bawden, 2001), but these seem a somewhat inappropriate development, and have not gained wide interest.

Continuing confusion of terminology makes the development and use of the concept difficult to follow. Eshet-Alkalai (2004) suggests that "indistinct use of the term causes ambiguity, and leads to misunderstanding, misconceptions, and poor communication" and that there is a particular inconsistency between those who regard digital literacy as primarily concerned with technical skills and those who see it as focused on cognitive and socio-emotional aspects of working in a digital environment.

While some commentators during this period have used the digital literacy terminology in Gilster's sense—a broad concept with its emphasis on knowledge assembly from diverse sources and on critical thinking—some have still equated it with computer literacy, focusing on IT skills, as part of a wider information literacy (see, for example, Williams and Minnian, 2007), while others have equated it with network literacy, focusing on effective use of internet and other networked resources (see, for example, Hargittai, 2005, and Kauhanen-Simanainen, 2007). Burniske (2007) uses it for a concept very much focused on the "critical thinking" aspect, including: the critical and tactful use of language; the critical evaluation of websites; the analysis of visual content on the web; the analysis of digital information for credibility, logic and embedded emotional content; and the practice of good ethics and etiquette on the internet. Other uses of the term are noted by Eshet-Alkalai (2004).

To add to the confusion, other terms have been used for what appears to be very much Gilster's idea of digital literacy. The phrase "e-literacy," stemming

from “electronic literacy,” and still generally used as a synonym for skills-based computer literacy, has been adopted in some quarters as virtually synonymous with digital literacy, as in the definition in a Leeds University (UK) glossary of teaching technology:

e-literacy—not to be confused with illiteracy, e-literacy is a much debated topic which goes some way to combine the traditional skills of computer literacy, aspects of information literacy (the ability to find, organize and make use of digital information) with issues of interpretation, knowledge construction and expression (<http://www.leeds.ac.uk/glossaries>)

It has been seriously suggested, as implied in the above definition, that a main reason that the e-literacy terminology has not been widely adopted is because of the potential confusion with illiteracy in spoken discourse; at all events, the definition above shows a close link with Gilster’s conception. Martin (2003, 2005) similarly presents e-literacy as a central concept, drawing on a range of other literacies—information, media, computer/ICT and even “moral literacy”—and involving awareness, understanding and reflective evaluation as well as skills—very similar to Gilster. Indeed, Martin (2006b) suggests that digital literacy and e-literacy are synonymous. Kope (2006) also reviews the concept, arguing that it should be understood as having a component of “academic literacy” close to the “research literacy,” learning styles, interpretation and integration of earlier writers.

Conversely, the “information literacy” terminology is still used for concepts seemingly very close to Gilster’s. An example is a training program in “information and critical literacies,” which offers a non-linear adaption of the traditional linear model of information literacy instruction (Markless & Streatfield, 2007). This has three inter-linked elements:

- connecting with information (orientation, exploring, focusing, locating)
- interacting with information (thinking critically, evaluating)
- making use of information (transforming, communicating, applying)

With its non-linear structure, and emphasis on critical thinking and communication, this seems very similar to Gilster’s digital literacy, despite the alternative choice of name.

The more general digital literacy concept, with specific recognition of Gilster’s concept as its basis, was used as the basis for a two-week professional development course for library / information specialists from Central/Eastern

Europe and Central Asia at the Central European University in Budapest, from 1997 to 2001 (Bawden & Robinson, 2002). The course initially focused very much on skills and competences for effective use of the internet (Robinson et. al., 2000), but—as participants year-on-year came with greater familiarity with this—it changed focus to consider more general aspects of the use of information sources generally and networked information in particular. Gilster’s digital literacy was used explicitly as the unifying theme. In the context of the new countries and emergent democracies of this region, the idea of digital literacy, and particularly its critical thinking component, proved to be a valuable focus for structuring the course. Indeed, the promotion of critical thinking within a digital literacy framework has been put forward as one of the principles that underlie the role of libraries and other information providers in supporting open societies (Robinson & Bawden, 2001).

A renewed interest in Gilster’s digital literacy ideas, ten years on from their original publication, may be seen, most notably in an edited book with the phrase in its title, and with a chapter contributed by Gilster (Martin & Madigan, 2006a). [Though the publication date of the book suggests an earlier appearance, it appeared almost exactly a decade after Gilster’s original.] The preface (Martin & Maddigan, 2006b) acknowledges the significance of Gilster’s concept a decade on—in a world in which networked information has expanded into all aspects of life—and in particular the importance of “ideas, not keystrokes” at its basis.

The book’s overall theme is summed up by saying “Digital literacy may have some merit as an integrating (but not overarching) concept that focuses upon the digital without limiting itself to computer skills and which comes with little historical baggage” (Martin, 2006a). This seems a reasonable enough assessment of the status of the concept, ten years on. Any view of information and its use that did not focus upon the digital would be perverse at the present time, while the lack of “historical baggage”—arguments about the meaning of terms, assessments of whether they have positive or negative connotations, and turf wars as to which community can lay claim to them—is a definite advantage. The “integrative” aspect also silences many unproductive arguments. Digital literacy touches on and includes many things that it does not claim to own. It encompasses the presentation of information, without subsuming creative writing and visualization. It encompasses the evaluation of information, without claiming systematic reviewing and meta-analysis as its own. It includes organization of information but lays no claim to the construction and operation of terminologies, taxonomies and thesauri. And so on.

Gilster (2006) uses his contribution to this volume not to revisit his original ideas but rather to draw attention to one specific development of the intervening decade, and its implications. This is the increasing overlap between “content” (formally published materials) and “communication” (informal messages); the former is represented by books, journal articles, etc., the latter by letters, diary entries, etc. Distinct entities in printed media, they overlap in the digital realm through such things as blogs and wikis, undeniably communication, but with the potential to generate content. This has implications not just for the day-to-day practices of scholars, and the activities of librarians, but also for the meaning of concepts such as “collection.” Navigating the products of this “digital fusion,” with new products and forms of information always likely to emerge is, for Gilster, the major current challenge. Although he does not say so in this chapter, this seems a logical extension of his earlier vision, involving as it does ideas of search and navigation, knowledge of resources, and knowledge assembly.

The digital literacy concept has also been central to the DigEuLit project, which took a “Gilster-like” broad approach in defining digital literacy as:

the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (Martin, 2006b)

This is extended into a description of thirteen specific processes (e.g., evaluation, synthesis, reflection) drawn from this definition, rather in the manner of the linear information literacy models defined above. Distinguishing digital literacy from these, Martin (2006b) notes that it is broader than information literacy, ICT literacy, etc., and subsumes a number of these individual literacies. He notes that it is also a quality that will vary according to each individual’s life circumstances, and will change and develop over time, since it involves attitudes and personal qualities as well as knowledge and skills. Like Gilster, he sees it as a life skill, not particularly associated with formal education.

In rather similar vein, Eshet-Alkalai (2004) describes a new conceptual model for digital literacy, as a “survival skill in the digital era,” though largely derived from, and mainly applicable to, the context of formal education. It is based on an integration of five other “literacies”: photo-visual literacy (the understanding of visual representations); reproduction literacy (creative re-use of existing materials); information literacy (understood as largely concerned

with the evaluation of information); branching literacy (essentially the ability to read and understand hypermedia); and social-emotional literacy (behaving correctly and sensibly in cyberspace). This appears to have much in common with the ideas of Gilster and Martin.

Finally, we should notice that what is commonly taken as the central theme of digital literacy—an ability to synthesize and integrate information from varied sources—is gaining increased notice as a crucial ability, in areas of study quite remote from those in which digital literacy is discussed. A striking example is Howard Gardner’s concept of the “synthesising mind,” which was identified as a breakthrough idea in 2006 by the *Harvard Business Review* (Gardner, 2006).

Understanding Digital Literacy Today

Despite some continuing inconsistency in the use of the term, we see that several authors, following Paul Gilster, are using “digital literacy” to denote a broad concept, linking together other relevant literacies, based on computer/ICT competences and skills, but focused on “softer” skills of information evaluation and knowledge assembly, together with a set of understandings and attitudes.

This is also referred to by other names, particularly e-literacy and, by some, information literacy. However, the former has not gained popularity, while it is strongly associated with the linear models espoused by the library community. Digital literacy seems an appropriate and sensible name, in an age where information comes mainly in this form; though with the caveat that an important part of digital literacy is knowing when to use a non-digital source.

Digital literacy in this sense is a framework for integrating various other literacies and skill-sets, though it does not need to encompass them all; as Martin (2006a) puts it, we do not need “one literacy to rule them all.” And, while it may be possible to produce lists of the components of digital literacy, and to show how they fit together, it is not sensible to try to reduce it to a finite number of linear stages. Nor is it sensible to suggest that one specific model of digital literacy will be appropriate for all people or, indeed, for one person over all their lifetime. Updating of understanding and competence will be necessary, as individual circumstances change, and as changes in the digital information environment bring the need for new fresh understanding and new competences; as Martin (2006a) puts it, digital literacy is “a condition, not a threshold.”

With these caveats, we might set out the four generally agreed components of digital literacy, as they emerge from the authors quoted above, in this way:

1. underpinnings
 - literacy *per se*
 - Computer / ICT literacy

These “underpinnings” reflect the rather traditional skills, of which we may now need to regard computer literacy as one, which make up an older idea of literacy, and an ability to function in society. It seems an open question as to whether they should be regarded as a part of digital literacy (perhaps in its formulation as “smart working” or “basic skills”) or whether they should be assumed, before digital literacy is grafted on.

2. background knowledge
 - the world of information
 - nature of information resources

This is the kind of knowledge that was assumed of any educated person, in the days when information came as books, newspapers and magazines, academic journals, professional reports, and not much else, and was largely accessed through physical print-on-paper libraries. The well-understood “publication chain”—from author to archivist, passing through editors, publishers, booksellers, librarians and the rest—lasted as a sensible concept well into the computer age. Now, it is largely meaningless, and there is no clear model to replace it. Nonetheless, attaining as good an understanding of what the new forms of information are, and where they fit into the world of digital information, has to be an essential start in being digitally literate.

3. central competencies
 - reading and understanding digital and non-digital formats
 - creating and communicating digital information
 - evaluation of information
 - knowledge assembly
 - information literacy
 - media literacy

These are the basic skills and competences, without which any claim to digital literacy has to be regarded skeptically. They are a remarkably wide set,

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and it would be sobering to try to assess to what degree they are possessed in the various countries of the world.

4. attitudes and perspectives
 - independent learning
 - moral / social literacy

These attitudes and perspectives are perhaps what make the link between the new concept of digital literacy, and an older idea of literacy, in vogue over two hundred years ago. It is not enough to have skills and competences, they must be grounded in some moral framework, strongly associated with being an educated, or as our ancestors would have said, a “lettered,” person. They are arguably the most difficult to teach or inculcate of all the components, but they come closest to living up to the meaning of information from “infomare”; the transforming, structuring force.

Taken as a whole, we see that the “underpinnings” give the basic skill sets without which little can be achieved. The “background knowledge” complements them, by giving the necessary understanding of the way in which digital and non-digital information is created and communicated, and of the various forms of resources which result. The competencies are essentially those proposed by Gilster, phrased in the terms of later authors. “Information literacy” implies competences in actively finding and using information in “pull” mode, while “media literacy” implies an ability to deal with information formats “pushed” at the user. Finally, the attitudes and perspectives reflect the idea that the ultimate purpose of digital literacy is to help each person learn what is necessary for their particular situation. “Moral / social literacy” reflects the need for an understanding of sensible and correct behavior in the digital environment and may include issues of privacy and security.

At the heart of this conception are ideas of understanding, meaning, and context (Bawden, 2001; Pilerot, 2006), following Gilster’s “ideas, not keystrokes.” It does not seem unreasonable to regard this kind of literacy, expressed appropriately according to the context, as an essential requirement for life in a digital age.

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