

The Personal Knowledge Base Conception of Information Literacy

A.A.J. (Jos) van Helvoort

The Hague University of Applied Sciences, Faculty of IT & Design,
Post Box 13336, 2501 EH The Hague, The Netherlands
a.a.j.vanhelvoort@hhs.nl

Abstract. Although most authors on Information Literacy do not really differ in their definitions of the information literacy concept, phenomenographic research makes clear that in the context of education at least two different conceptions can be distinguished: an “Information Problem Solving” conception and a “Personal Knowledge Base” conception [1]. The conception of “Information Problem Solving” has been elaborated on in various models by many researchers but the operationalization of the “Personal Knowledge Base conception” has, until now, been ignored in LIS research.

Based on educational literature a model for the content of a “Personal Knowledge Base” will be proposed. Two kinds of internalized knowledge are distinguished: the body of knowledge of the discipline and metacognitive knowledge. Both of these elements display sub content. This conception of information literacy as a “Personal Knowledge Base” is consistent with the idea that “learning to learn” is one of the main goals of Higher Education.

Keywords: Information literacy, information problem solving, personal knowledge base, metacognitive knowledge.

1 Introduction

Most of the researchers who study the phenomenon of Information Literacy agree that IL refers to a person’s broad ability to use information from various sources, which includes a set of six or seven sub-skills [1]. This ability is also referred to as ‘Information Problem Solving’ skills [2-3]. However, also mentioned is at least one other conception of IL that is distinguished in phenomenographic research, the so called ability to build or to extend someone’s Personal Knowledge Base. This conception of IL as building a knowledge base was introduced by Bruce in her ‘Seven Faces of Information Literacy’ [4]. Since this publication, the conception of IL as a PKB is often confirmed in the literature, but contrary to the Information Problem Solving-process, it has so far not been made operational in concrete sub-skills or actions. In this paper I will make suggestions to clarify the more abstract concept of a PKB.

2 Study Design

The research question was: which knowledge types can be distinguished in someone's Personal Knowledge Base? Because IL is considered a learning issue [5], the answers to this question were searched in the educational literature, more specifically those on design of instruction for vocational education and the literature on metacognitive knowledge. The main keyword that was used in Google Scholar to retrieve the information, was "personal knowledge" combined with a Boolean AND with "knowledge types" and / or "knowledge structures".

The purpose of the research was the construction of an IL model which integrates Information Problem Solving with the concept of the Personal Knowledge Base.

3 Findings

The Instructional Design Theory by Van Merriënboer and others describes how complex skills such as searching for research literature can be learned and can be transferred to other situations. The key component in their model is the skills hierarchy [6].

Figure 1 gives an example of such a skills hierarchy. In this case it was preferred not to use Van Merriënboers own hierarchy for searching for research literature but to use an example from some of his colleagues which refers to the complete skill of Information Problem Solving [3].

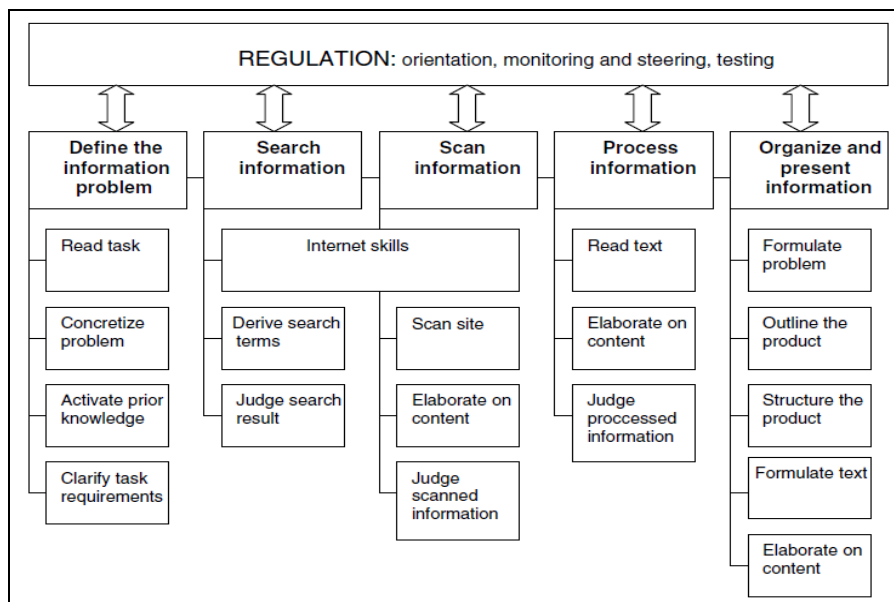


Fig. 1. Skills hierarchy for the "information problem solving skill" from Brand-Gruwel, Wopereis and Vermetten [3]

Execution of complex learning tasks as expressed in figure 1 helps, according to Van Merriënboer, the construction of cognitive schemata [6]. The schemata themselves can have two forms: mental models (declarative knowledge; knowing what, why) and cognitive strategies (knowing how something should be done). Both of these two types of knowledge refer to professional knowledge from the discipline in which the task is executed.

Schaap and others, whose backgrounds are that of vocational education, confirm the construction of mental models and cognitive strategies during their work on study tasks but they distinguish a third type of personal knowledge: the norms, beliefs and values of the discipline [7]. According to them, mental models and cognitive strategies can often be learned from instructions and books or other types of codified knowledge (and can therefore also be learned during the execution of information problem tasks). For the acquisition of norms, values and beliefs, the interaction with professionals is necessary. They can be codified in books and documents but they are best acquired during learning in workplaces, for instance during an internship. Nevertheless, according to them, the norms, values and beliefs of a person are a part of his or her “Personal Professional Theories”, which in our research is recorded as his or her PKB.

All the mental models, cognitive strategies, values, norms and beliefs that belong to a specific discipline, are also called the Professional Body of Knowledge (BoK) [8]. Researchers in Information Literacy, however, distinguish an alternative type of knowledge that is not related to a specific domain but can be characterised as knowledge about the cognitive process of learning itself, also referred to as “metacognition” [9]. This metacognitive knowledge is a result of the learning-to-learn process, the role of which is becoming more and more important in education [10].

The main resource to make the concept of metacognition more concrete was a paper by Pintrich [11]. He describes three types of metacognitive knowledge:

- General strategies for learning, thinking and problem solving. These include general knowledge about how to attack cognitive tasks or intellectual problems.
- Knowledge about different cognitive tasks, which includes knowledge about the strategies that can be applied to a particular task. Knowledge about cognitive tasks is therefore not only about ‘what’ the task is but also about ‘how’ and ‘when’ it can be performed.
- Self-knowledge about one’s strengths and weaknesses.

Alexander, Schallert and Hare mention the distinction of these three types of metacognitive knowledge as well, but they also distinguish a fourth component of metacognition, that is someone’s plans and goals [12]. They emphasise that these plans and goals are often influenced by the affective relations that people have with the task and the task environment. The difference with ‘self-knowledge’ is that someone’s plans and goals are often more influenced by motivational factors than by someone’s self-experienced strengths and weaknesses. Kuhlthau’s work [13] is a thorough description of the importance of this affective facet of someone’s ability to solve information problems and a study by Walraven more recently confirmed it [14].

4 Conclusions

Combining the “Information Problem Solving skills hierarchy” from figure 1 with the findings from the literature about the Professional Body of Knowledge and Metacognitive Knowledge results in an Integrated Model for Information Literacy (figure 2). It expresses all the activities that are carried out in the context of information problem solving and the (new) personal knowledge that is created with it. The two components of the model are connected with arrows that point in two different directions which indicates that they have influence on each other. During the solving of information problems, the existing knowledge from the Personal Knowledge Base is called up and used but during the same Information Problem Solving processes, new knowledge is created which leads to a modification of the Personal Knowledge Base [see also 7].

5 Discussion

This exploration of the concept of a “Personal Knowledge Base” is part of a more extensive research project on assessment of information literacy. In the larger project a scoring rubric was developed [15]. The scoring rubric of information literacy emphasised the activities and products of students who are actually solving information problems (the upper part of figure 2). The “Personal Knowledge Base conception” of information literacy that is presented in the lower part of figure 2, suggests a new research question, namely the question of how this personal knowledge of students can be measured or assessed. Related to this is the question of how Information Problem Solving and the construction of personal knowledge do exactly interact. However, these questions seem to belong more to the field of learning sciences than to the discipline of information sciences. It is nevertheless the intention of the researcher that the integrated model for Information Literacy which is proposed in this paper, contributes to a bridge which closes the gap between those two fields of science.

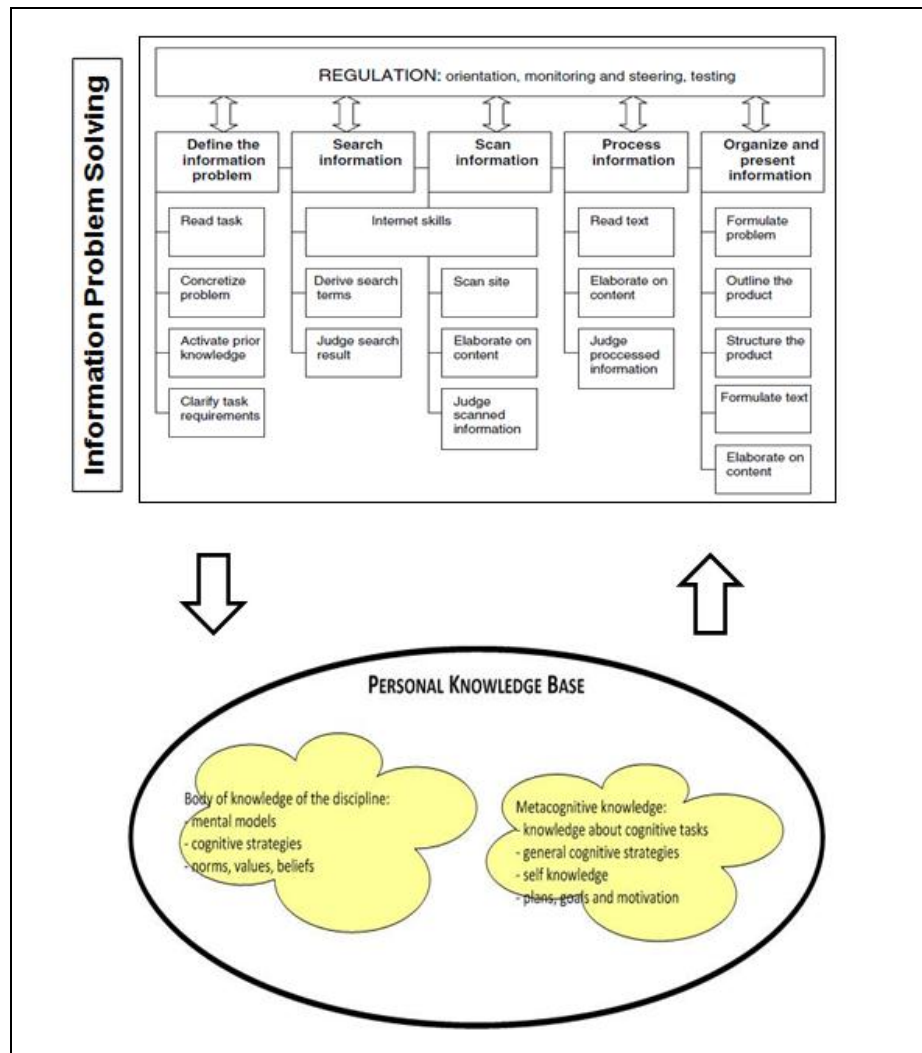


Fig. 2. Integrated Model for Information Literacy

References

1. Helvoort, J. van.: Impact of Recent Trends in Information and Communication Technology on the Validity of the Construct Information Literacy in Higher Education. *Communications in Computer and Information Science* 96 (2), 61--73 (2010)
2. Berkowitz, R., Eisenberg, M.: *Information Problem-Solving : The Big Six Skills Approach to Library & Information Skills Instruction*. Ablex Pub. Corp., Norwood, N.J. (1990)
3. Brand-Gruwel, S., Wopereis, I., Vermetten, Y.: Information Problem Solving by Experts and Novices: Analysis of a Complex Cognitive Skill. *Computers in Human Behavior* 21 (3), 487--508 (2005)
4. Bruce, C.: *The Seven Faces of Information Literacy*. Auslib Press, Adelaide (1997)
5. Breivik, P.: *Student Learning in the Information Age*. American Council on Education/Oryx Press, Phoenix, Ariz. (1998)
6. Merriënboer, J. van, Clark, R., Croock, M. de.: Blueprints for Complex Learning: The 4C/ID-Model. *Educational Technology Research and Development* 50 (2), 39--61 (2002)
7. Schaap, H., Bruijn, E. de, Schaaf, M. van der, Kirschner, P.: Students' Personal Professional Theories in Competence-based Vocational Education: The Construction of Personal Knowledge Through Internalisation and Socialisation. *Journal of Vocational Education and Training* 61 (4), 481--494 (2009)
8. Hodgson, D.: Disciplining the Professional: The Case of Project Management. *Journal of Management Studies* 39 (6), 803--821 (2002)
9. Boekhorst, A.: *Informatievaardig Worden in het Onderwijs, een Informatiewetenschappelijk Perspectief: Een Vergelijkende Gevallenstudie in Nederland en Zuid-Afrika*. University of Pretoria, Pretoria (2000)
10. Bundy, A. (ed.): *Australian and New Zealand Information Literacy Framework: Principles, Standards and Practice* (2nd ed.). Australian and New Zealand Institute for Information Literacy, Adelaide (2004)
11. Pintrich, P.: The Role of Metacognitive Knowledge in Learning, Teaching, and Assessing. *Theory into Practice* 40 (4), 219--225 (2002)
12. Alexander, P., Schallert, D., Hare, V.: Coming to Terms: How Researchers in Learning and Literacy Talk about Knowledge. *Review of Educational Research* 61(3), 315--343 (1991)
13. Kuhlthau, C.: *Seeking Meaning : A Process Approach to Library and Information Services*. Ablex, Norwood, N.J. (1993)
14. Walraven, A.: *Becoming a Critical Websearcher: Effects of Instruction to Foster Transfer*. Open Universiteit, [Heerlen] (2008)
15. Helvoort, J. van.: A Scoring Rubric for Performance Assessment of Information Literacy in Dutch Higher Education. *Journal of Information Literacy* 4 (1), 22--39 (2010)