How Information Literate Are We as Teachers?

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Abstract. The purpose of the research was to provide academic staff with insights into their own information behavior and to motivate them to refer to relevant, accurate and reliable resources in their own course materials. To achieve this we used a participative research approach. Six participants assessed course materials created by themselves or by colleagues from their own department. It was found that in the course materials for the undergraduate ICT program of a university of applied sciences, in-text citations are often missing. If references are made, they are mainly references to general information sources like handbooks and popular or semi-scholarly websites. We discussed these findings in a focus group.
An important additional benefit was the experience acquired with the participative research approach for improving the staff's own information behavior.

Keywords: Information literacy, higher education, teaching staff, participative research, citation analysis, focus groups.

1 Introduction

The 21st century is typified by an overabundant availability of digital information. Information literacy - the competence to search, select, evaluate, analyze and organize information - is therefore supposed to be a key competence for professionals today and in the future [1, p.9; 2]. Most higher education programs that prepare students for their professional careers thus include some learning objectives in the field of finding and using information. The application of digital information sources in educational situations has also led to a demand for information literacy skills during the learning process [3, p. 50]. In other words, these skills are not only learning objectives intended to prepare the students for their future workplaces; they also function as learning competences that are needed to be successful during their study career itself.

Since information literacy or "information problem-solving" skills are so important in higher education, it is assumed that teachers should set a good example for their students by displaying their own information literacy. The information behavior of teaching staff has indeed been reported to have a strong impact on student perceptions of information

literacy [4-6]. Little research however has been done on the actual performance of teachers. A search for relevant literature in LISA, LISTA and ERIC - the main bibliographic databases for library & information science and education science - resulted in only one paper on the information literacy practice of teachers [7].

In the current paper we use the Scoring Rubric for Information Literacy [8-9] as a theoretical framework. In this assessment instrument seven dimensions of the construct 'information literacy' are distinguished. The present research explored the information behavior of academic teachers on two dimensions of the information literacy construct: the reliability and authority of information sources in their course materials, and references made in the text to those sources (criterions 2 and 4 in the definitive Scoring Rubric for Information Literacy) [9]. The research method used was citation analysis. The goals of the research were to provide teachers with insights into their own information behavior by using a participative method and to reflect on the findings of the study. Research questions to be answered were:

- To what extent do teachers refer to the information sources they use in the course materials they develop, and
- To which type of literature are the teachers referring?

2 Methodology

2.1 Participants

The research is conducted at a Faculty of IT & Design at a university of applied sciences in the Netherlands. Six teachers in the undergraduate ICT program contributed to the research by serving as coders of the course content (some of which they had written themselves). Most of these teachers, three male and three female, were experienced senior teachers and were also members of the Curriculum Board of the ICT program. They were not experts in information literacy but represented either one of five subject differentiations or the professional skills training course. The representative of the professional skills course was unable to participate and was replaced by a colleague. The research design in which the participants coded their own course materials kept the researchers from being regarded as controllers or the "examiners with the red pencil". The participative research method motivated the teaching staff to reflect critically on their own and their colleagues' performance and to change their own practices if there were reasons for it.

2.2 Course materials

The undergraduate ICT program in which the research is conducted is a comprehensive bachelor's program which started in September 2015. The program integrates, throughout the first half year, five former subject-based courses and consists of the following six domains: software engineering (SE), network & systems engineering

(NSE), business and management (B&M), information security management (ISM), information & media studies (IMS) and professional skills. For each of these domains, the teaching staff produced new course materials that were used in the first ten weeks of the program (September-November 2015). The teaching method in the ICT program is that of the "flipped classroom", a type of blended learning strategy where instructional content is also delivered outside of the classroom through videos and presentations in a digital learning environment. Examination occurs through the assessment of professional products and a multiple-choice test with items from all six subject domains.

In the research, all newly created course content that was found on the collaborative Sharepoint site (50 documents) were analyzed. Figure 1 gives the document types of the newly created course content.

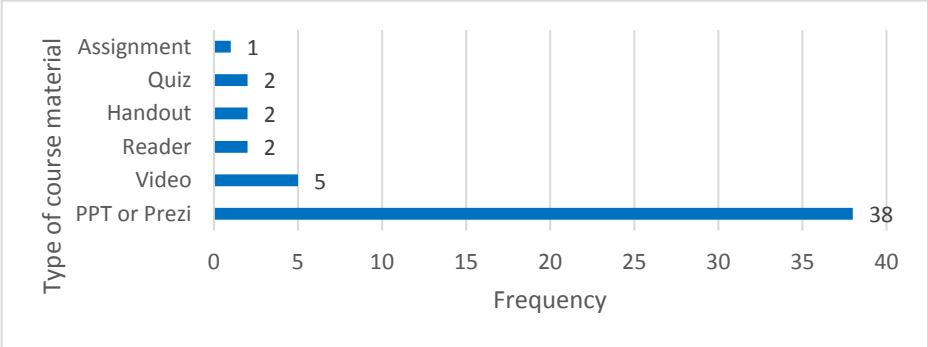

Figure 1 Frequency of the types of course materials that were used

2.3 Procedure

Course materials were downloaded and provided to the participants beforehand by a link to a Sharepoint folder. The materials were distributed among each of the representatives of the six domains. Each participant was asked to execute a citation analysis and to assign one or more codes to each of his or her course materials to indicate the types of information sources referred to (derived from a list of types of information sources as given in Table 1). There was also an optional field that could be used for a type of content not listed in Table 1.

Table 1. Types of information sources being referred to (Note: The students' mother tongue was Dutch)

Handbooks in Dutch	Popular article in Dutch	Report or Whitepaper in Dutch
Handbooks in English	Popular article in English	Report or Whitepaper in English
Open Educational Resource	Popular website in Dutch, for instance Wikipedia.nl	Research article or conference paper in English
Standards (ISO)	Popular website in English, for inst. Wikipedia.org	Scholarly website in English
Own content / unclear which resource is used		

The quantitative results of the citation analysis are discussed in a focus group that included all the participants and the head of the department, its intention being to find deeper insights into the findings and to formulate follow-up questions about the next step in the research into the faculty's information literacy skills.
Questions that are discussed were:

- How satisfied are the participants with the results?
- Do participants think that the academic staff should take steps to improve their use of information sources?
- Do participants have suggestions for further research?

The discussion is recorded and transcribed verbatim using an intelligent verbatim style: pauses and phrases with no meanings like 'uuh' and 'you know' were omitted [10].

2.4 Data analysis

The outcomes of the citation analysis are presented by ranking the types of resources. A thematic analysis was conducted on the verbatim transcript made of the focus group's discussion in order to provide a descriptive account of issues and illustrative quotations to highlight these issues in participants own words [11].

3 Findings

3.1 Quantitative results

Figure 1 gives the distribution of the types of information sources referred to in the 50 course documents.

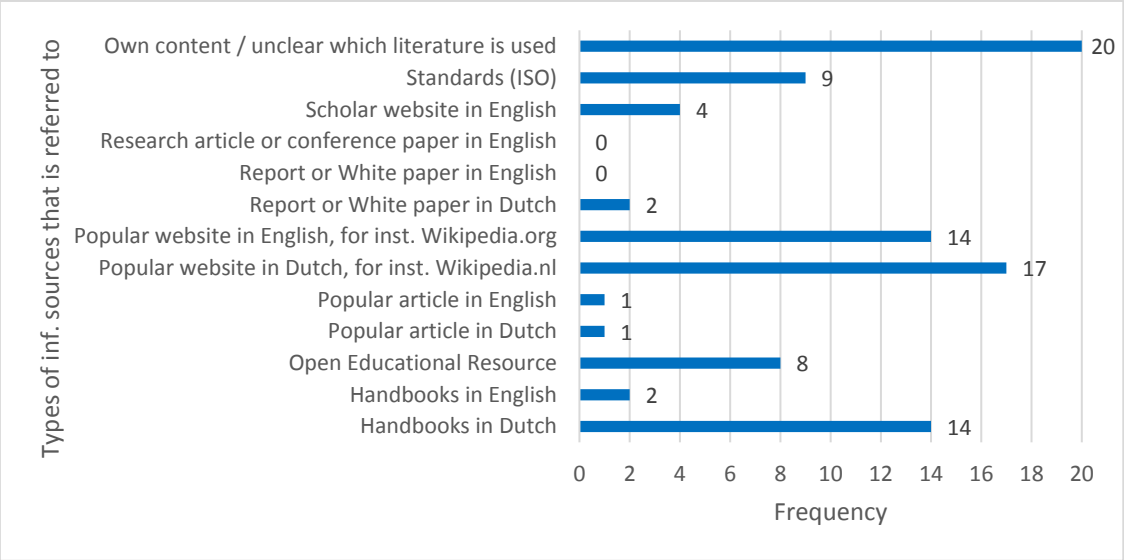

Figure 2 Distribution of reference types in 50 course documents

When we focus on the PowerPoint and Prezi presentations we find a distribution as displayed in Figure 3.

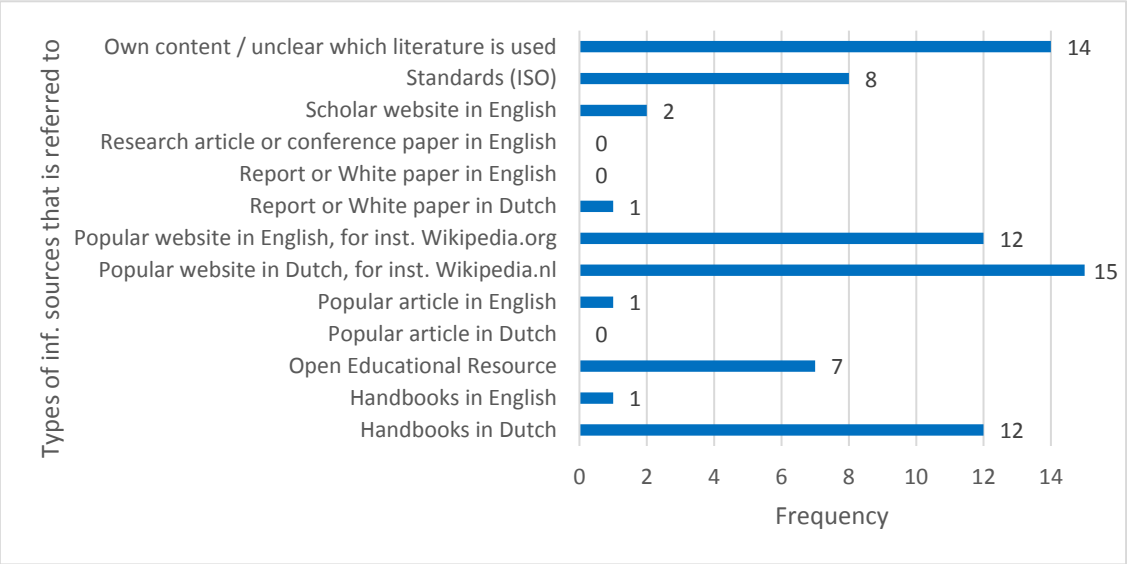

Figure 3 Distribution of reference types in 38 PowerPoint or Prezi presentations

Both Figures 2 and 3 show that teachers use a broad range of information sources for their course materials but that there is an obvious top three:

1. Popular websites in Dutch
2. Popular websites in English
3. Handbooks in Dutch.

However, there is also a lot of content without any references (the last category in Figures 2 and 3 in which the source is unclear).

3.2 Qualitative results

The quantitative results from Section 3.1 are discussed in the focus group. The participants agreed that they often refer to rather popular and generic information sources (websites, handbooks) because these information sources are more appropriate for students in their first year of an undergraduate program. According to the participants, academic journal articles and conference papers are often too hard to understand for undergraduate students. This is why they preferred to refer to sources in which the same information is explained in a more easily understood manner.

The second observation from the quantitative results in Section 3.1 – the fact that there is a lot of content without any references – was an important topic in the discussion. According to the participants, there is a lot of knowledge which is rather generic and which can be found in many different books. This type of knowledge is also referred to by the participants as “knowledge acquired by experience”. One of the contributors said: “Sometimes I don’t even remember where I acquired it”. In their

opinion, this – but also the fact that this knowledge is quite basic and does not change over the years – explains the rather high number of course materials that contain content for which the information source is not clear. One of the participants remarked however that relying on "common knowledge" also carries the danger of ignoring new developments in the domain. She also mentioned another reason to refer to various types of resources: "We know that students have different learning styles. Some of them learn best by listening to the explanations given by a lecturer; others prefer to have the opportunity to re-read this material at moments that suit them best."

A second reason why teachers do not always refer to information sources, according to the participants of the focus group, is that a lot of learning content in the undergraduate program refers to skills that need a lot of training. In this case, "learning by doing" is the best instructional strategy while referring to scholarly literature seems rather unnatural. The undergraduate ICT program prepares students for jobs in private and not-for-profit organizations. Most of these students do not need to be educated for research work. The participant representing the software engineering domain was thus of the opinion that "the academic literature addresses topics that are really different from the topics that we see as important for our educational program". However, other participants replied that it is not enough to be competent in programming or "to be able to write codes" in the current work environment. Young professionals also need to be able to solve problems, gather data, and to compare different solutions.

At the end of the focus group discussion, the members of the group concluded that most of the participants are the opinion that referring to academic papers is not preferred in the more technical domain at the undergraduate level. The representative of the business domain (Business & Management and Information & Media Studies) had a slightly different opinion. He tries to stimulate paying attention to scholarly literature.

The key question, of course, was whether the teachers would change something in their information behavior. The participants expressed their intention to give more attention in their PowerPoint and Prezi presentations to references to literature in which the learning content could be re-read. This should be done at least for ethical reasons – to give an author or creator the credit for his or her work – but also for didactic purposes.

4 Conclusions

In this research we tried to find out to what extent teachers in the undergraduate ICT program at a university of applied sciences refer to information sources in their course materials and, if so, to which type of literature they refer.

Most of the course materials in the investigated bachelor's course were PowerPoint presentations. These presentations, due to the undergraduate level of the ICT program,

most often referred to rather generic information sources like handbooks, and non-academic websites. It also appeared that academic staff "forget" to refer to information sources in their slides and handouts because this information is based on "common knowledge" that is not derived from one specific information source. The participants in the focus group agreed that they could improve their own and their colleagues' behavior on this point. It was interesting that the discussion about references in PowerPoint presentations is also found on academic forum websites like Academia Stack Exchange [12].

By applying a participative research method in which faculty staff gathered data about the course materials created by themselves and their own colleagues, the researchers succeeded in their attempt to stimulate staff members to reflect on their own information literacy behavior and to seek to improve it. Limitations of the research, however, were the restriction to only two dimensions of the information literacy construct (availability of in-text citations and the quality of the cited information sources) and the restriction to 50 pieces of course materials from a freshman's year in an undergraduate program.

In the focus group discussion, the participants explicitly expressed that they intend to pay extra attention to the available information sources in their presentations in the future. If they do, this would not only be an improvement in the ethics of teaching but also an improvement in the didactic approach since it would provide students with the opportunity to process theory in different ways and through different channels.
In future research, we would want to find out whether the intervention had succeeded. Our present research can thus be considered as the start of a longitudinal research project. One of the questions we still have is whether the types of literature referred to during later years of the degree program differ from those referred to during the first year. We also have plans to extend this type of research to include other faculties at our university and to conduct it on a larger scale.

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