Library & Information Science Research 39 (2017) 69–75

Contents lists available at ScienceDirect

Library & Information Science Research

Evaluation components of information literacy in undergraduate students in Slovenia: An experimental study

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ARTICLE INFO

Article history:
Received 27 September 2016
Accepted 23 January 2017
Available online 7 February 2017

1. Introduction

Alongside the right to universal access to information, the right to education, and the right to information literacy (IL), IL competencies are of key importance. New IL programs are constantly being developed to increase students' IL proficiency. To do so the complexity of the information behaviors associated with IL, including the cognitive, behavioral, cognitive and affective elements, must be considered (Bowles-Terry, 2012; Farrell, Goosney, & Hutchens, 2013; McClurg, Powelson, Lang, Aghajafari, & Edworthy, 2015; Walton & Hepworth, 2011). Mastery of IL competencies has tested by researchers longitudinally (e.g., the Strategies for Assessment of Inquiry Learning in Science [SAILS] project) in different ways, including using current information tools and testing IL proficiency before and after an IL certificate. Researchers such as Fain (2011); Farrell et al. (2013); Forys, Forys, Ford, and Dodd (2000); Kratochvíl (2013) and Lockhart (2015) have used a variety of different experimental approaches.

Although there are many international studies confirming higher levels of IL proficiency after a program is completed (Fox, Richter, & White, 1996; Tarrant, Dodgson, & Law, 2008; Verhey, 1999), such research has not yet been carried out in the Slovenian higher education system, where IL programs are not yet implemented. The choice of an appropriate IL program and the evaluation of its effects still present huge research challenges. Saunders' (2012) statement that educational institutions have not identified ways to integrate IL into the curriculum in a systematic way, or to move beyond individual courses to the program level, can also be identified as problems in Slovenia. Studying existing IL programs is important because it enables comparison of the influence of different programs in different environments. As a result, it also makes the implementation of programs in individual education systems, which are specific for each study environment, easier. A successful IL program is never finished. An IL program as a whole and its component modules must be constantly evaluated, reworked, updated, and tailored to user needs (Sonntag & Ohr, 1996). The traditional educational approach is systematically planned and guided and does not allow an integrated conceptual approach, which is crucial for IL. Weak general literacy is a result of failings in the educational system (Novljan, 2003; Novljan, 2005).

2. Problem statement

The main purpose of this study is to prepare an IL program for Slovenian higher education, based on IL models and programs in the world, and to test that program. The results are important for higher education policy in Slovenia, and for teachers and others who work in educational institutions, and who should be aware of the importance of IL and its effects on lifelong learning.

In a small country like Slovenia, educators in higher education strive for flexibility, universality, and quality (Špiranec, 2003; Špiranec, Toth, & Zorica, 2009). Slovenia pays 6.1% of its GDP for formal education, which is comparable to other countries, but the money is not efficiently used. IL is not explicitly mentioned as a goal of higher education policies, it is not part of university curricula, and professors do not trust librarians' pedagogical expertise. IL is left to the initiative of individual teachers, and therefore no reliable statistics on how it is taught exist. Only 20% of academic libraries in Slovenia teach IL, while 80% provide bibliographic instruction. Educational initiatives and teaching methods are more or less left to librarians. Only five out of 52 libraries confirmed that such education is a part of mandatory education for faculty; and only one faculty awards European Credit Transfer and Accumulation System (ECTS) points for this kind of education. Also, there are more modules designed for undergraduate than for postgraduate students. Evaluation of the quality of courses and testing of gained knowledge are extremely rare. Both academic management personnel and financiers are unaware of the importance of courses and evaluation of knowledge regarding education initiatives such as IL.

Guidelines for IL in central and south Europe, including Slovenia (Stopar & Rabzelj, 2006), do exist, but on national levels there are no strategies, standards, or educational policies which explicitly include IL. Most universities do not teach IL systematically. The shortage of IL specialists, money for information sources, and technological support

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http://dx.doi.org/10.1016/j.lisr.2017.01.009
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only gets worse each year because of the financial situation in these countries (Basili, 2003). Slovenia, for example, does not have a national policy, vision, or special financial source for IL. A handful of professors are aware of the importance of IL and in their opinion education resulting in information literate students is a global as well as national responsibility. Unfortunately, this is not enough for formal implementation of IL into the Slovenian higher education system. Slovenian higher education, therefore, is lacking regarding IL. Smith (2013) suggested that the current curricular mandates are insufficient to ensure that IL is incorporated into instruction, and also teachers are ill-prepared to instruct in IL effectively.

Many students can only express their information needs poorly, cannot evaluate information, and have difficulties with research hypotheses. They are familiar with the basics of copyright, but rarely use them in source management (Godec, Jug, & Kotar, 2006; Petermanec & Pejova, 2005). Similarly, many librarians receive insufficient support from their institutions, and so must educate their users voluntarily. There are only a few academic libraries in Slovenia that actively participate in the pedagogical process. IL provision is neither coordinated nor systematic and is largely based on traditional patterns and individual initiative.

Most Slovenian higher education institutions do not include IL in their study programs, which can have important negative consequences for the quality of students"' competencies. These consequences include poor quality written work, low level use of appropriate databases for searching for resources, and poor knowledge of resources available and their ethical use. The basic problem is the lack of awareness of the positive effects of IL among higher education teachers and researchers.

While many IL researchers have studied the general level of students' IL (Bruce, 2008; Huvila, 2011; Kaplowitz, 2014), they have rarely combined that research with examination of IL programs and measurements of the success of their results. This study focuses on a suggested IL program and how it was tested within the Slovenian higher education system. The research questions are

RQ1. Can the IL program improve students' proficiency in individual IL components?
RQ2. Does the level of IL proficiency in individual IL components differ before and after the completion of the IL program?
RQ3. Which IL competence did the students determine to be the most difficult and which needs future improvement?

3. Literature review

IL is a strategy that will improve the study habits of every student in any discipline and guide him or her in lifelong learning (Snavely & Cooper, 1997). The main purpose of modern IL education is to achieve functional literacy using information and communication technology. This is an important step toward the understanding of the concept of IL (Bawden, 2001; Behrens, 1994; Doyle, 1992). The IL standards developed by the Association of College and Research Libraries ([ACRL], 2000) make it clear that the mission of IL must be coordinated with the mission of the home institution. This document clearly defines the input and expected results, and establishes a basis for lifelong learning.

IL program planning is based on past knowledge and experience. It considers planning of IT development and library services development. It defines contents, programs and courses for IL teaching. It considers different study levels and it actively integrates different partners, including students, teachers, librarians, and IT specialists, who exchange their teaching and evaluating experiences and are constantly involved in the process of further education. Their work is constantly evaluated. A faculty supports IL if it provides financial means and cooperation of participants in the process of IL. This cooperation must be a priority of the entire institution and not only of its library (Kasowitz-Scheer & Pasqualoni, 2002).

IL stresses student-oriented learning and enhances the likelihood of an upgrade in student learning and information proficiency throughout the whole study period. Good IL programs can also help provide a competitive advantage for academic institutions, for their graduates are better qualified for future employment. Such programs must be prepared on the basis of a student needs analysis. It is also important to ask the following questions while preparing IL programs: Why do students need to find information? How can they find information? What do they have to know to use information successfully (Kardoš, 2002)?

According to most established models and standards, such as Bruce (1997), the Big6 (Eisenberg, Lowe, & Spitzer, 2004) and the ACRL standards, the important IL components are as follows: acknowledgment or awareness of information needs, including searching for and access to information; evaluation and use or application of information; and expertise regarding the rules and ethical norms for the use of information. Among these components, Lenox and Walker (1993) emphasize the analytical and critical competencies while formulating a research question, and the evaluation of search results. An information literate person must have analytical and critical competencies so she or he can formulate a research question, evaluate the results, and search for different ways to access various types of information that will satisfy information needs.

IL competencies are present when an individual has the ability to use knowledge for the successful and efficient completion of a certain task or job. The individual abilities of an person possessing the competencies of IL include knowledge, talents, skills, personal and behavioral characteristics, concepts, beliefs, values, and self-image. All those abilities help to guarantee professional or personal success.

Several studies have shown the importance of search, retrieval, interpretation, and understanding, which play a central role in the acquisition of information seeking skills. The ability to effectively search for and evaluate information has the potential to help students better understand the nature of science and scientific knowledge (Gross & Latham, 2009; Julien & Barker, 2009).

Studies suggest that the implementation of IL programs contributes significantly to students' use of bibliographic databases and journal literature, and have a positive impact on the development of different dimensions of their information literacy (Chu, Tse, & Chow, 2011; Jacobs, Rosenfeld, & Haber, 2003; Verhey, 1999). Students who were involved in a course with consistent inclusion of a substantive information literacy-related assignment tended to rate the effectiveness, importance, and impacts of information literacy instruction, and their own information literacy skills higher than those in a course with an inconsistent level of engagement with information literacy (Kim & Shumaker, 2015). Fox et al. (1996) demonstrated that students benefit from IL programs, developing information literacy skills and the confidence needed to use those skills. Cooperation between academic librarians and professors in different fields can create conditions for the improvement of those IL competencies which are beneficial to students. Brown and Krumhol (2002) implemented the ACRL standards to determine students' IL proficiency and found an 11% increase in information literacy, but no significant improvement in the students' abilities to present, critique, and discuss information. Tarrant et al. (2008) tested IL proficiency before and after an IL program and concluded that prior to commencing the program, students reported low information literacy and writing skills, especially in accessing and searching electronic databases and using referencing formats. Post-test evaluation of skills showed substantial and statistically significant increases in all assessed competencies. The findings of one recent study indicated that students lacked the IL proficiency required to succeed in the post-secondary educational environment and libraries were not prepared to effectively address this gap (Smith, Given, Julien, Ouellette, & DeLong, 2013).

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