

Exploration on the Teaching Mode Reform of “Information Retrieval” Driven by Innovative Ability Developing

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Abstract

Information Retrieval is a professional curriculum of the information management, in which teaching process should take innovation ability developing as consideration, combining with cultivating information literacy. This article defines the innovation ability, meanwhile decomposes the ability into knowledge. It puts forward the idea that the teaching designing should originate from self-learning with problem-finding, which requires a coresponding that experiments apart should be the dominant one instead of theory teaching, accomplishing self-conducted learning.

Keywords

Information retrieval, teaching mode, innovation ability, information literacy.

1. Introduction

Studies have shown that the most important characteristic of scientific research performance is innovation and the innovation in scientific research performance will directly affect the survival and development of colleges and universities[1]. No of innovation ability developing can be separated from practice, which is an important and indispensable link in the innovation ability development. If we understand innovation ability from the perspective of information, then it can be described as new ideas and things created by human beings using existing knowledge. Therefore, innovation ability development is closely related to the cultivation of information literacy.

In the Information Literacy Competency Standards for Higher Education promulgated by the Association of College and Research Libraries (ACRL) in 2000, information literacy is clearly decomposed into: the ability to determine the character and scope of the required information, the ability to efficient access to the required information; the ability to critically evaluate information and its sources, the ability to effectively utilize information, and the ability to understand issues related to its use and acquisition[2]. ACRL promulgated the Framework for Information Literacy for Higher Education in 2015, which emphasized that colleges and universities need to adjust the content of curriculum system according to the frontier of information literacy development and the current situation of information literacy of college students[3].

2. Innovation Ability Development in “Information Retrieval”

2.1. Present Situation

Through literature research, in current literatures about teaching reform of Information Retrieval, there are so many ways such as flipping classes, PBL teaching mode, and the pulling of information literacy into course. However, few literatures explicitly study the teaching of information retrieval combined with innovative ability developing , which weakens the purpose of curriculum learning to a certain extent.

“Information Retrieval” is one of the core curriculums of information management and information system in our university. It has gone through the process of quality course construction, PBL teaching reform, formative evaluation teaching reform and MOOC construction. However, in the process of teaching, teachers still find that students' enthusiasm is not strong enough. Fig.1 shows the statistics of online learning time of students in Information Retrieval in the 2017~2018 (2) semester (cooc.cqmu.edu.cn). As can be seen from the figure, students accumulated most of their online learning time in one month before the examination, presenting a state of abnormal sudden learning. At the same time, through the communication between teachers and students, it is found that most students in this major simply equate information retrieval with database retrieval. This is contrary to the original intention of this curriculum.

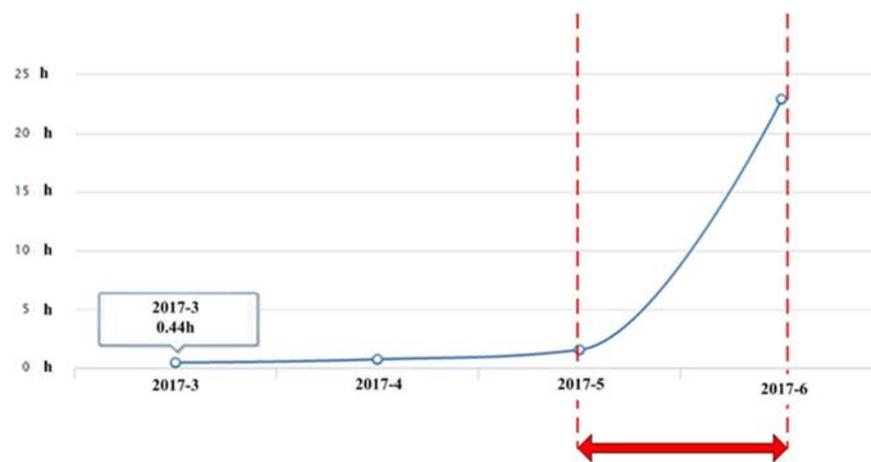


Fig 1. Statistics of online learning time of students in “Information Retrieval”

Therefore, as a curriculum to develop students' professional core competitiveness, Information Retrieval is bound to face new teaching reform. In this teaching reform, our teaching team focuses on the goal of "planning teaching content from ability requirements and driving autonomous learning by problem-finding".

2.2. Teaching Reform

This teaching mode integrates the concept of PBL and flipping class. On the one hand, it starts from the design of scenarios and the solution of problems[4], on the other hand, it reverses the traditional learning process[5]. As a consequence, in the design of teaching process, it emphasizes that practical operation takes precedence over theoretical learning. Students should discover problems from practice and arouse their interest in autonomous learning. Therefore, revolving around the goal of innovation-driven learning, the reform of the teaching mode of Information Retrieval can be divided into the following aspects:

2.2.1. Definition of Innovation Capability

Focusing on the cultivating objectives of undergraduate course of information management, the innovative ability would be defined and decomposed concretely and systematically, combining with the requirements of information literacy on cultural, information awareness, and information skills.

2.2.2. Correspondence between Innovative Abilities and Knowledge

The decomposed innovation abilities are represented to the teaching process one by one, including the determination of teaching purpose, the combining of teaching content and the adjustment of teaching methods. Fig.2 shows the representation of innovation abilities and information literacy to the teaching process after decomposition.

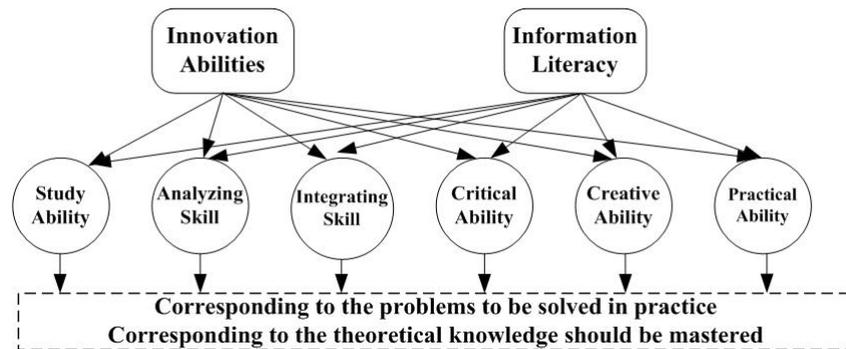


Fig 2. Correspondence between innovation abilities and information literacy

Traditional Information Retrieval only requires students to master information retrieval skills. However, in this reform, we believe that we should further deepen the exploration of information retrieval principles, the application of information retrieval and the embodiment of innovation ability and information literacy in information retrieval.

2.2.3. Teaching Mode Reform

In the traditional teaching mode, the practice learning is following the theory learning, which is reserved in this reform. Fig.3 shows the comparison of these two teaching modes.

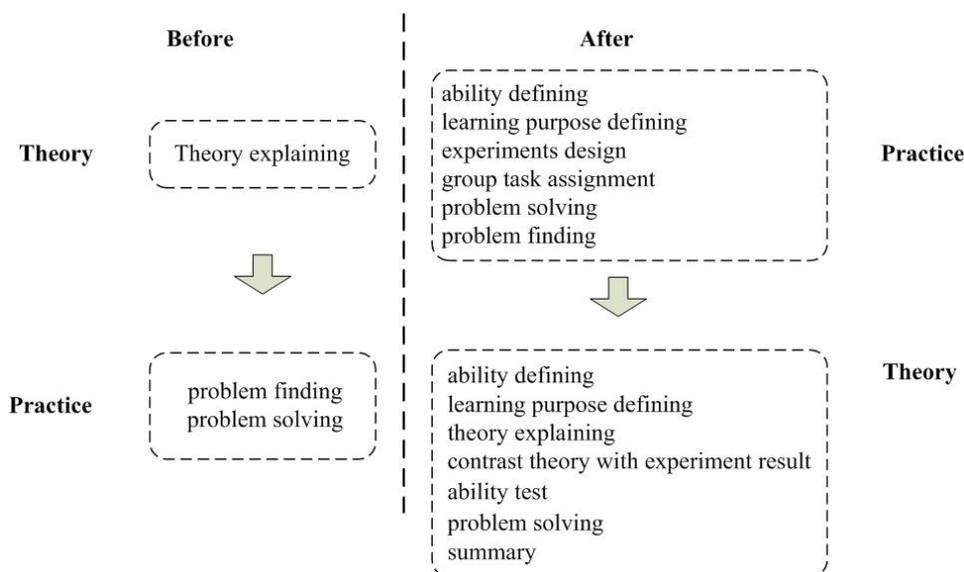


Fig 3. Comparison of two teaching modes

We take "Search Engine" as an example in Chapter 2 of the course, which is the first learning focus of the application of information retrieval principles, and the only way for students to improve retrieval skills. But most students majoring in information management have been already very skillful in using search engines. If we still use the traditional way of "explaining basic concepts → explaining principles → doing exercises" in teaching, the important position of this chapter in the whole course will not be reflected, and even would affect the follow-up study of students. Therefore, the core of this reform is to plan the teaching content from the students' actual abilities, and to drive self-learning by problem discovery. On the one hand, it subverts the order of traditional teaching. On the other hand, it corresponds teaching content with innovation ability and information literacy, which can help both teachers and students accomplish their tasks and test the effects. Tab.1 shows the teaching design.

Table 1. "Search Engine" teaching design

	Practice operation (team group)	Abilities	
Step 1	Q: What is the definition of scholar search engine? What's the difference between scholar search engine and other databases? Presenting the principle of search engines with a flow chart.	➤ Ability to organize and visualize knowledge	
	Q: Please retrieve the relevant information of "Diabetes Complicated with Cataract" by Baidu and Baidu Scholar. Please compare the similarities and differences.	➤ Ability to express information needs Ability to retrieve information	
	Q: Please discuss a function of Baidu and explain its shortcomings.	➤ Critical thinking ability ➤ Ability to communicate effectively with others	
	Theory learning	Abilities	
Step 2	Principle of search engine	Reviewing: Inverted File Learning: Index, relevance, weight Expanding: PageRank	Ability to compare different knowledge
	Evaluation of search engines	Learning: Evaluation indicators of search engines Expanding: Bidding ranking	Ability to understand "Information Ethics"
	Implementation of search function	Learning: schematic diagram of searching Expanding: similarity matching algorithms, semantic network	Ability to create new works

3. Conclusion

This reform of teaching mode is based on years of teaching practice and students' demand for innovative ability training, which is a very bold assumption and attempt in specialized courses teaching. As the reform of teaching mode is in progress, the effect of this reform is expected to be reflected in the following three aspects: improving the teaching effectiveness, developing of innovative ability, and cultivation of information literacy.

At the same time, members of the teaching team also hope that this reform can provide reference for other courses in the mode of innovative ability-driven teaching reform, and provide new ideas for students' innovative ability developing.

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