

# *Suggestions for Teaching Reform in Information Storage and Retrieval Courses*

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**Abstract:** In the rapid development of the informationization environment, the information storage and retrieval course, which aims at cultivating and improving students' information literacy, is becoming more and more important. The thesis focuses on analyzing the problems existing in three aspects of information storage and retrieval course materials, classroom teaching and course assessment, and puts forward targeted suggestions in combination with the characteristics of teaching materials, the modern teaching model BOPPPS ideas, and course characteristics, respectively, with a view to improving the teaching methods of information storage and retrieval courses and promoting the development of information storage and retrieval courses.

## 1. Introduction

The “Internet+” era is followed by the continuous change of the information environment, and the teaching mode of information storage and retrieval courses is also exploring its own development<sup>[1]</sup>. Liang HN<sup>[1]</sup> takes “Document Management and Information Analysis” of University of Science and Technology of China and “Information Retrieval” of Wuhan University as an example, explains the advantages and limitations of large-scale network open course MOOC teaching, and discusses the introduction of small-scale restrictive online courses in the teaching process of information retrieval using the network platform as a medium to realize the hybrid teaching mode of MOOC, SPOC and traditional teaching by using each of their own strengths. J Li, CM Gui, XZ Meng<sup>[2]</sup> conducted a research on information retrieval courses in local universities, mainly discussing the issues of class time, teaching content, teaching mode, etc. Based on the characteristics of the specialty, they gave corresponding suggestions for course reform in terms of teaching content and teaching mode. J Du<sup>[3]</sup> starts from the teaching mode of information retrieval course, and gives the reform plan of the teaching mode of information retrieval course by analyzing the teaching content, mode, means, evaluation and other aspects. The exploration of teaching reform in information storage and retrieval under the backdrop of new media and technology should not only focus on the teaching platform, but also encompass the instructional process of the information storage and retrieval course within this new context.

## 2. Frequently Asked Questions about Teaching Information Storage and Retrieval Courses

### 2.1 Problems with teaching materials and suggestions for improvement

With the rapid development of science and technology, various “Internet+” platforms and network resources such as “WeChat” and “Catechism” based on cloud computing, data mining and Internet of Things technology have been developed. With the emergence of various “Internet+” platforms and network resources such as “WeChat” and “Mucon”, the updating progress of the current textbook content has lagged far behind the development speed of various new media, which limits the expansion of teaching content in the horizontal domain and polarizes the distribution of knowledge. For example, the existing textbook content of information storage and retrieval retrieval technology to focus on the introduction of the information storage content of a sweeping over<sup>[4]</sup>, which is easy for students to form information storage and retrieval courses, as long as they can use the retrieval technology can be cognitive bias, ignoring the learning of professional theory, resulting in the knowledge of the situation of the reasons why not know the reason why; the existing information storage and retrieval course of the majority of the teaching materials have a general knowledge, without taking into account the professional characteristics, due to the specialty has a general knowledge, and the professional characteristics of the course, and the teaching content is not considered. Most of the existing teaching materials for information storage and retrieval courses are of general knowledge, without considering the characteristics of specialties. Due to the differences in specialties, different specialties will have different emphasis on the teaching knowledge of information storage and retrieval, and the teaching materials that do not combine with the characteristics of specialties will make the modern teaching more difficult.

In response to the above problems, the following suggestions are given: first, in the preparation of textbooks, we should keep up with the background of the times and introduce new search tools to broaden and enhance the knowledge structure of students; second, increase the knowledge content of the principles and techniques of information storage and retrieval. The impression given by this course should not be the impression of how to find information, but should also have an in-depth and systematic introduction to the principles of information storage and retrieval<sup>[5]</sup>. The course of information storage and retrieval is a fundamental component in the field of information management and systems. Students specializing in this area are required not only to acquire a solid foundation in theoretical knowledge related to information storage and retrieval, but also to delve deeper into the theoretical aspects encompassing these topics. For instance, when studying search engines as an aspect of information retrieval tools, students should not only be familiarized with the classification and principles underlying each type of search engine, but also gain insight into specific procedures or algorithms employed by search engine components such as searchers, analyzers, indexers, and retrievers. This comprehensive approach ensures that students possess a well-rounded understanding of professional knowledge. In e-commerce majors, information storage and retrieval as an elective course, for information retrieval skills need to deepen the knowledge, to cultivate students higher knowledge search ability, in the preparation of the textbook need to introduce more cases, maximize the improvement of students' knowledge acquisition ability.

### 2.2 Problems in classroom teaching and suggestions for improvement

In the traditional information storage and retrieval classroom teaching activities, teachers usually teach the course knowledge points through the textbook, the teacher is the transmitter, the student is the listener, this knowledge transmission mode is filler indoctrination; the basic theoretical knowledge has its dryness, if the lack of background introduction before class, the indoctrination teaching will make the students lack of information storage and retrieval course learning enthusiasm<sup>[6]</sup>; The lack of

interaction during lectures hinders the receipt of timely feedback from students and impedes the ability to promptly assess student mastery, resulting in suboptimal teaching outcomes.

The emergence of the BOPPPS teaching model provides an effective measure for classroom teaching reform. The BOPPPS model is a kind of teaching process design proposed by educators from the perspective of cognitive theory. The BOPPPS classroom teaching model is divided into six steps: an introduction session to raise learning interest, a clear learning objective for students, a prediction session to understand students' basic knowledge, a participatory learning session to allow students to participate in multiple aspects of teaching to master knowledge, a post-test session to see if the lesson has achieved its purpose, and a summary session to summarize the knowledge points. The students are encouraged to actively engage in various aspects of teaching and learning in order to achieve mastery of the knowledge. Additionally, a post-test is administered to assess the attainment of teaching objectives, followed by a comprehensive summary of key concepts.<sup>[7]</sup> Therefore, this study combines the theoretical ideas of the BOPPPS teaching model to give the following suggestions for classroom teaching improvement:

First, classroom introduction. The selection of the introduction topic should be based on students' interests, taking into consideration the information environment of the current society, in order to enhance students' focus on upcoming learning content. For instance, when teaching the chapter on search engine concepts and functions, one can choose to introduce the Harbin cold economic heat vitality events as a starting point. Additionally, by selecting different keywords to demonstrate variations in search engine results, students will gain an understanding of the significance of keyword selection and develop a deeper comprehension of search engine working principles.

Secondly, a pre-teaching knowledge prediction session is added before the knowledge point is taught in the classroom. The main purpose is to understand the interest and ability of students, and indirectly learn whether the preparatory knowledge needs to be reviewed, so as to adjust the depth and progress of the course content. For example, database is the preparatory knowledge of information storage, when teaching the knowledge of information storage, we need to increase the pre-testing of this knowledge, in order to adjust the content and depth of the information storage knowledge.

Thirdly, in the participatory learning link needs to actively mobilize students' active learning mood. The curriculum should integrate the student's information needs to establish appropriate content. Leveraging the professional training features, the e-commerce program can utilize the national college students' e-commerce "innovation, creativity, and entrepreneurship" Challenge Project as a foundation for instructional design. Through task-oriented learning, students engage in information gathering, business writing, and even active participation. Throughout this process, students are encouraged to independently employ various search skills and adjust their strategies until they achieve satisfactory results. This approach not only reinforces classroom knowledge but also facilitates comprehensive application of theoretical concepts into practical scenarios<sup>[6]</sup>. In the classroom teaching of information management and information systems students, the principle knowledge of information storage or retrieval can be taught in depth, combined with the editing of programs or algorithms, to mobilize the interest of students to participate actively. For instance, in this chapter on search engine optimization, students can collaborate to acquire knowledge of website design and apply it to create their own websites with embedded search engines. This approach not only enhances the practicality and innovation within the classroom but also fosters an open and enjoyable learning environment that effectively integrates theoretical knowledge with hands-on experience.

The fourth step involves designing classroom exercises during the post-test session to assess students' mastery of knowledge and determine if the teaching objectives have been met, with the aim of enhancing improvement. The teaching of information retrieval skills can incorporate keyword extraction strategies and search question prioritization techniques to assess students' mastery. These

techniques should be presented alongside the relevant subject's professional background, enabling students to independently analyze the subject matter and extract appropriate search terms for formulating effective search queries.

### 3. Problems and Suggestions for Improvement in the Assessment Methods of Information Storage and Retrieval Courses

The assessment method of information storage and retrieval courses also needs to be changed urgently. Existing information retrieval course assessment method is the same as other course assessment methods, using the traditional combination of usual grades and paper examination results to quantify the degree of mastery of the course. The disadvantage of this assessment method is that students think that they can easily pass the course just by making a temporary effort at the end of the semester, instead of really caring about the improvement of their information literacy. The ratio of the traditional assessment method of the usual grades and paper examination results is to focus on the paper grades to the detriment of the usual grades, information storage and retrieval of the course curriculum is designed to cultivate students' ability to access information, information organization, information evaluation and comprehensive use of information, and ultimately improve the information literacy of the students. The final paper grade can only reflect the mastery of basic theoretical knowledge, but the comprehensive use of information retrieval ability cannot be accurately measured, in view of this should increase the proportion of experimental course hours and the proportion of experimental scores, the theory and practice of the same view.

### 4. Conclusion

The paper examines the current challenges in information storage and retrieval course materials, classroom teaching process design, and assessment methods from three perspectives. It provides constructive suggestions by integrating technological development background, the BOPPPS teaching concept to enhance teaching effectiveness, and discipline-specific characteristics. Additionally, it explores the incorporation of participatory learning elements within the BOPPPS teaching approach to offer guidance for improving the instructional outcomes of information storage and retrieval courses.

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