Help Students Take Notes in Different Stages of Learning

Zhen LIU, Yu-Ling LIU, Sai-Nan ZHANG, Xue HAN and Ren-Hai PENG

Anyang Institute of Technology, Anyang, Henan, China

liuzhen378@163.com, liuylay2012@163.com, 869141377@qq.com, 2259926061@qq.com, aydxprh@163.com

Corresponding author

Keywords: Note-Taking, Cornell Note System, Learning Stages.

Abstract. It is necessary for every student to acquire an efficient note-taking skill for future study and review, however, not everyone has the note-taking skill and make full use of it. The present study attempted to develop a note-taking program, aiming to help college students to take notes. In this program, teachers and students had made corresponding preparation on notes in different stages of teaching: before class, after class, in class, and out of class. Consequently, this systematic procedure improves the accuracy of students’ lecture notes. In addition, there is a positive feedback in an anonymous survey about this note-taking method.

Introduction

An effective note is helpful for students to improve their study efficiency and to remember important information [1-3]. The traditional teaching in a lecture course usually follows a model of introducing new materials, asking students to review the information at a later time, assessing students’ understanding by an examination. However, we realized that students were experiencing difficulties with note-taking. Students do not listen well while they are taking notes [4].

Many college instructors have found that when they stand on the platform and teach the course, most of the students only look down at their notes and write down word-by-word what the teacher says, but they do not pay much attention to the context that the teacher teaches and the reason why such a point is so important to take notes. That is to say, many students tend to take notes and process information in an auditory manner by recording what they have heard without thinking. In my opinion, a good note should be completed both in class and out of class. This is because although students learn in the classroom is the most important learning style, but learning process must include preparation before class, do some reading outside class, phased review and summing-up work. If students prepare before class, they would know what the teacher will talk about, furthermore, students can construct their own knowledge by reviewing the notes and reading something related to the course after class [5-7].

Good notes should include notes throughout the learning process and it will promote students fully understand and solidify knowledge. To help students make notes more efficiently, we develop different forms for different learning processes. Moreover, it is obvious that the more orderly students’ notes are at creation, the easier students are to understand, revise, and study. Therefore, a special note format was used in the bioinformatics class. We have designed the different kinds of note pages with the same standard size, page layout and style, therefore students can integrate all of these notes together by a folder. A good note-taking habit plays a significant role in students’ academic success and a good set of notes is one of the most important assets in getting ready for an examination. Furthermore, by examining the notes, teachers can also understand the student's learning situation. With the help of our methods, we hope the students can improve their note-taking skills.
Method

Before Class

Clear learning goals tell students what they should learn and even how to achieve them [8]. The course syllabus provides a map or a signpost for students, telling them where the course is going and what is important that should be taken. Therefore, we ask the students to look at the syllabus, understand learning objectives before a lecture and encourage them search for relevant information on their textbook and the web site. Students must take their preparation notes which the teacher might be check before class. The preparation notes are very simple, just a list of few points will be enough.

In Class

In college, listening to the course in class is a prime source of information, and it is a good study habit for students to take notes while they are listening [4], because students may not remember what the teacher has taught in class in a later time. However, listening to lectures sets three challenging tasks for students: attend and make sense of the argument, think about what is said, and make some kind of notes. In my class, we have tried two ways to help students mediate listening and writing.

![Figure 1. The PowerPoint Slides (A) and Cornell Note-Taking System (B) Used in the Lecture.](image)

We have prepared the PDF format of PowerPoint with three slides on one page and set margins on the right which is used to take notes (Fig 1A). In this way, students won’t need to copy the contents on the PowerPoint slides, and they will have more time to pay attention to what the instructor says and understand the contents. The PowerPoint slides used in the lecture have been put on the website before class, students can download and print them before class.

Cornell note-taking system is designed to save time and it is highly efficient [3]. The Cornell method is an excellent system for organizing and reviewing lecture notes and it is helpful for students to increase comprehension and critical thinking of course materials, which was devised in 1950s by Walter Pauk, an education professor at Cornell. The larger column on the right is the place where students take lecture notes (Fig 1B). Students can use an outline or a paragraph format to write down, including diagrams, special comments and problems/solutions that teachers have displayed on the
blackboard. The left column is designed for students to write down key words or brief phrases so as to make a cue of the lecture. What is more, the left column with key words can also be used to review or test oneself with the help of right-hand column where the lecture notes have been recorded in detail. In addition, the section in the bottom is designed to write a summary of the main ideas, because organizing a summary is another way to help students review and think critically what they have learned.

Even so, taking notes may interfere with listening and comprehension, students may have trouble in keeping pace with the teacher, we encourage students use some tips of taking note, such as abbreviations, etc.

After Class

New knowledge received in the lecture is a big burden for students on their working memory. Periodic summary is a good method to ease this burden because it gives students time to chunk the information [9]. Visualization with the form of creating mental images is a fundamental cognitive process which has been proved that it can improve students learning. Mind map is an excellent way to do this [10, 11]. When a course chapter was finished, we ask the students to transcribe the content of this chapter into a mind map. Students always started with a table of contents, get the main ideas and familiar with the structure of the course, then delve into materials. The notes of mind map allow students to recall information easily and make it easy to organize ideas and concepts.

Out of Class

Extended reading and extensive reading out of the class can help students form a comprehensive understanding of the course. In addition, reading research papers is also a skill that every student has to learn. We have designed a reading log table (Fig. 2), including the source of reading materials, main ideas of the literature, and related teaching contents, so as to help students expand their knowledge and store information in a long-term memory. This table is very convenient for students’ regular revisions, and it can be used as a critical tool for students to prepare further studies.

![Reading Log](image)

**Figure 2. The Reading Log Table.**
Integrate Notes Together

We design a file folder for the students to collect notes in different stages of study, including the preparation notes before class, PowerPoint slides with margins and Cornell system in class, mind map of periodic summary and reading log notes out of class. All of the note page in the folder have standard size (A4 paper) and should be filled in the title and date. Every page can be added or deleted expediently so students can update and correct their notes expediently.

We explain the note taking method to the students at the beginning of a term. The students should hand out their notes occasionally; some good notes were selected and compared by the students themselves. Furthermore, we always give students feedback on their notes.

Results

Class Performance

Bioinformatics is a compulsory course for the major of bioengineering and biotechnology. These two classes use the same syllabus, content, pedagogy and were taught by the same instructor, and were separately taught in different time and different classrooms. In order to test whether this note-taking method is an effective way or not for students’ knowledge enhancement, a study was conducted in 2016. Students in biotechnology class (39 students) experienced the note-taking training program while the bioengineering class (57 students) did not.

Students of biotechnology can see their learning achievements during the learning process, which strengthens their confidence and make them possess a sense of ownership of the course when they step into the class. Students of bioengineering always poorly prepared before class, while the students of biotechnology were well prepared, they participate in the class more actively, and they can answer the teacher’s question better. In addition, my colleague and I often found that the students of biotechnology class were printing and binding their note pages in the office. All of these show that they like this note-taking methods very much.

Online Anonymous Survey

1. Is the note-taking method helpful for your learning?
   - No, 75% (43/57)
   - Yes, 93% (53/57)

2. Give a score to the note-taking method, 5 is the best.
   - 5: 4% (2/57)
   - 4: 14% (8/57)
   - 3: 5% (3/57)
   - 2: 0% (0/57)
   - 1: 4% (2/57)

3. Which of the following learning progress is most helped by the note-taking method?
   - Remember: 70% (40/57)
   - Understand: 19% (11/57)
   - Thinking: 11% (6/57)
   - Reading Log Table: 16% (9/57)
   - Course Summary: 24% (14/57)
   - PowerPoint Slides: 26% (15/57)
   - Cornell Note-taking: 25% (14/57)
   - Learning Goals: 21% (12/57)

Figure 3. The Survey of the Note-Taking Method.
At the end of the semester, students in biotechnology class were asked to answer five basic questions about the note-taking training program in an online survey (Socrative, http://www.socrative.com/). All of the 39 students completed the survey (Fig 3). The majority (93%) of students indicated that the note-taking method was helpful for their learning, and 82% of the students give 5 points to it; to the question “Which of the following learning progress is most helped by the note-taking method”, 70% indicated that it helped them remember the contents, 19% indicated that it helped them understand the knowledge better and 11% indicated that it made them do more thinking; when being asked “Which part do you like best”, 21% indicated the clear learning goals, 25% indicated the Cornell note-taking system, 26% indicated print PowerPoint slides, 12% indicated course summary notes and 16% indicated the reading log table. Furthermore, students were also given an opportunity to provide additional comments on the method. The followings are students’ responses to this question, “The self-test of Cornell note-taking system really made me see how much I did, and didn’t know”; “it showed me how to focus my learning on ways that will help me remember it in the long-run”; “The print PowerPoint slides, help me so much”. All of these suggested that the note-taking method was successful, and students benefited a lot through this note-taking method.

Discussion

It is demonstrated that the act of writing down ideas is helpful to memorize the concept or information [4]. Moreover, note-taking can enhance retention of knowledge and promote a deeper thinking. The purpose of this paper is to help students take notes in different stages of learning. The systematic procedure of note taking used in the present study proves to be an effective way for students to acquire their achievements, and the survey result is also positive.

Preparation notes before class make the students have a clear learning goal, once students know what should be learned in a class, they should be clear about what to do during the lecture so as to facilitate understanding and taking class notes. The PowerPoint slides with margins and the well-designed Cornell note-taking system saves time for students so mediate the conflict between listening and understanding. A course summary with a note form of mind map help the students review what they have learned and can possibly brainstorm what else they might know about a topic. Reading log table is a good way for students to expand their knowledge by collecting reading materials. Furthermore, to provide convenience for students review and improve their notes, we integrated all of these notes together by a folder, which will help students construct a more holistic and comprehensive understanding of the course. [7, 12].

Acknowledgement

This research was financially supported by the Anyang key laboratory of bioinformatics and pilot reform of bioengineering in Anyang Institute of Technology.

References


