2012 International Conference on Applied Physics and Industrial Engineering

Inquiry Learning’s Implementation and Evaluation in the Teaching of Information Technology

Lu Xue-song, Liu Qi-hui, Chen Jie
Information Engineering College, Yangzhou University, Jiangsu, China

Abstract

This text combines the inquiry learning method with the characteristics of information technology education, and completely exerts the autonomy, independence, collaboration, process and openness of inquiry learning, to promote the teaching of information technology. At the same time, this paper puts forward the evaluation rules of inquiry learning in the teaching of information technology and summarizes the attentive problems in the evaluation process.

© 2011 Published by Elsevier B.V. Selection and/or peer-review under responsibility of ICAPIE Organization Committee. Open access under CC BY-NC-ND license.

Keywords: information technology teaching, inquiry learning, evaluation

1. Reasons of the implementation of inquiry learning in the Information technology teaching.

In traditional teaching, teachers, who hold the completely dominant position, have become accustomed to the way of teaching to impart knowledge to students. Compared to some subjects of strong theoretical knowledge, the teaching approach is feasible to some extent.

As opposed to the information technology course, there will be a lot of problems, for example: If the teachers only teach in the classroom to enable students to take notes and copy blindly in the following steps with no more operating in practice, then when the students encountered the specific problems they can not flexibly operating and only operate at random rely on rote knowledge points. Because the information technology course emphasizes the capacity of students to use knowledge, hands-on ability, not just remains in the memory stage. If you ignore the dominant position of students for a long time, the enthusiasm and initiative of students is completely gone. Therefore, the importance of how to mobilize and maintain the enthusiasm of the students in this course is self-explanatory.

Inquiry learning is a new way of learning which is based on students’ autonomy and exploratory. It focuses on students in hands-on practice, independent thinking, independent learning, and problem-solving abilities. At the same time it attaches importance to teaching, learning subjects’ (students, teachers) subjectivity, initiative, respect for the autonomy and creation of the learning process, which can be combined with information technology teaching to play its advantages.
Inquiry learning is under the guidance of teachers, imitating the process of scientific research, selecting or determining the research topics from the natural, social and life, using a variety of learning resources in an open scenario, taking the initiative to acquire knowledge, apply knowledge and solve problems through multiple channels. [1]

By using of inquiry learning methods, a lot of open and diversified problems can well be solved in information technology teaching. In this process, students can stimulate enthusiasm for learning, enhance their divergent thinking, cultivate co-consciousness, and improve problem-solving abilities.

2. Characteristics of inquiry learning in the information technology teaching.

2.1. Emphasis on the autonomy and independence of the students

Many problems have not only one but several approaches to solve in information technology teaching. When students have had the necessary experience to solve such problems, they do not according to the methods of teachers’ taught to solve such problems; otherwise they might form a mindset affecting students thinking. At the same time, inquiry learning is different from all forms of passive learning, stressing the students’ autonomy and inquiry as a basis, through creating a certain context of scientific inquiry to enable students to independent inquiry, practice, development and experience, thus cultivating the students’ innovative thinking and analytical issues, problem-solving abilities.

2.2. Emphasis on the cooperation among the students

There are many complex and comprehensive problems in information technology teaching. Students may not solve these problems due to lacking experience or other reasons. But things can be different when they require adoption of collaborative learning from each other, collecting the common wisdom, dividing and cooperating. Meanwhile, the manifestations of inquiry learning are generally cooperative learning groups and collaborative research groups, which need students to learn how to interact and explore, and continuously complete the problem-solving program and effectively trained with cooperation spirit, cooperation methods, and interpersonal skills.

2.3. Emphasis on the practical ability of the students

The information technology teaching pays great attention to cultivate hands-on practical abilities of the students. Therefore, the design of many problems not just stops at the simple application to the knowledge, more of which is the contents’ expansion and extension of textbooks. Through the use of inquiry learning, while the students are solving the problems, they can identify problems and put forward questions, cultivate their thinking skills and practical abilities. In this way, students can continuously accumulate and apply the experience in the learning process, put the newly acquired knowledge into the original knowledge structure, and also the students’ practical abilities can be cultivated while they are solving the problems.

2.4. Emphasis on the learning process of the students

Although the information technology teaching focuses on the quantification and operability of students’ learning results, inquiry learning emphasizes on the whole learning process rather than results. Through the inquiry learning the students can not only learn basic knowledge to meet the requirements of teaching, but also acquire other knowledge and relevant skills. The most important thing is that in this process, students can obtain many direct feelings and experiences through their own personal experience, and understand the general processes and methods of scientific research, fully enjoy the process.
2.5. Emphasis on the learning openness of the students

The introduction of inquiry learning in information technology teaching is the use of its differences and uncertainty characteristics. Using this learning approach, students can, according to their own interests and learning needs, use their existed knowledge and experience, combine with new knowledge and experience of learning, and solve the complex problems in information technology teaching. This will not only consolidates the knowledge, but also exercises their thinking skills. In addition, students can choose to participate in learning time in a timely manner, according to their own interests and needs in extra-curricular, to learn and expand the knowledge in information technology teaching taught. For the students, they have a more open learning content and time.

2.6. Emphasis on the innovation of the students

There are many open questions in information technology teaching, which require students not to rigidly adhere to books, not to stick to conventions, to break the old mindset in the process of problem-solving. While the inquiry learning approach is just meeting this demand of information technology teaching, it can give full play to the students’ initiative, encourage students to explore boldly when they are learning, put forward their own new perspectives and new ideas, and enhance innovative thinking.

In view of the characteristics of the above about inquiry learning, teachers should be flexible and reasonable to the use of them in the teaching process. At the same time, teachers should pay attention to the evaluation of learning outcomes of students after the use of inquiry learning, especially the evaluation of the effectiveness of the learning process. So, how should teachers evaluate? What aspects should be pay attention to when the teachers are evaluating?

3. The evaluation rules of inquiry learning in the information technology teaching

3.1. Focused on the evaluation of the learning process, rather than the results

There are many open questions that need to be resolved in information technology teaching. Although the final hope of students’ achievement is the same, different students may use different methods to solve this problem, so that things shown in effect is different. Thus, in evaluating, some works may be well received due to its superior effects, while others are simply mentioned, did not do too much evaluation. But in fact, we should focus on the students’ learning process, and focus on what the knowledge learned and how effectiveness in the process.

Each student wants to complete the tasks outstandingly assigned by teachers, their original intention is good, but it may be due to some reason, during the operation students can not rely on their own strength to better achieve their desired effect, of course, the effects of the work is not so perfect. However, in the process of solving this problem, the students know their own shortcomings and what they need. At the same time, they had consolidated their learned knowledge and experienced more from their own experience, with more direct experience, but these feelings can not be felt by others people, so teachers should attach importance to the evaluation process when they are in the evaluation.

3.2. Evaluation findings should be targeted, rather than a simple rating

For the course of information technology, teachers can not simply play a score or write a class to finish up, in the evaluation of student learning, they should indicate where the advantages of student assignments are and where the shortcomings are, and give students a detailed description to enable students to better understand their own problems in dealing with such problems. Because the scores and grades can not effectively measure the pros and cons of a method and can not demonstrate the students’ personalization in
handing issues, so, teachers should be more use of some of the detailed description or qualitative analysis when they are in the evaluation.

Meanwhile, teachers should inform students of evaluation findings in time. Only when students are aware of their own shortcomings in dealing with some kind of problems, they can avoid some problems happening again when they deal with such problems in the future. Moreover, students’ awareness of their own shortcomings will stimulate their desire for knowledge, and they will search for knowledge actively. In this way, the knowledge of students will be broadened and deepened; the characteristics of inquiry learning can play better.

3.3 While evaluating the students’ mastery degree of knowledge; teachers should focus on application rather than mechanical memory.

In information technology teaching, a lot of knowledge and skills will be used in the future, with a delayed value. Thus, in information technology teaching, teachers should pay more attention to whether the students can make flexibility in the use of knowledge, rather than just simply record in their mind. Applicability stress that students can use the knowledge and skills they have learned, contact with real life, more applied it to the practical problems raised and resolved. Therefore, in information technology teaching, the evaluation of inquiry learning approach is not only paying attention to the students’ mastery of knowledge and research findings, but also concerning the students’ flexibility of knowledge and skills.

Only in this way, students can attach importance to this discipline from the psychological. At the same time, they will note the knowledge with each other within in disciplines and between subjects. While studying this course, students can play their subjective initiative and apply the acquired knowledge flexibility; when handing in papers, they can put the acquired knowledge to show as much as possible.

3.4 Using a diversity evaluation, focusing on student self-evaluation and peer evaluation

In information technology teaching, many problems need students into groups to common solution, which is the feature of inquiry learning. Under the traditional teaching model, teachers’ task is complete after they have evaluated the pros and cons of problem-solving of different groups.

The evaluation of inquiry learning should be completed unilaterally by teachers, but also with the students’ self-assessment, peer assessment as well as parents’ and other experts’ evaluation. This evaluation will not only reflect the common needs of students, but also reflect the needs of individual, and the purpose of the evaluation is really achieved. Among them, the students’ self-assessment and peer assessment should be given full attention. Because the learner himself is personally involved in the study, his experiences and feelings are more accurate, meanwhile they are also the best understanding of the learning situation of the other members of group, and their evaluation is more practical, the situation of student learning is more truly reflecting.

4. The evaluation of inquiry learning should pay attention to some problems in information technology teaching

There are many random and open issues in information technology teaching, at the same time, the development and execution of curriculum in classroom is also very random and open. After the use of inquiry learning approach in information technology teaching, its evaluation will have a number of vulnerable areas of negligence, coupled with not yet have a complete and mature evaluation system. Therefore, in the evaluation process, we should note the following areas:
4.1. The timely evaluation must be done in the case of ensuring the students’ initiative and enthusiasm.

When teachers are achieving the timely evaluation and timely feedback, the students’ initiative and enthusiasm need to protect. Because the knowledge points of the information technology course is very boring, some points are dead in it. However, when students meet some practical problems, it requires students to be able to use flexibly. Therefore, after making evaluation, the teacher should promptly communicate with students, so that students know their shortcomings, and how to improve. In this way, students can give full play to their subjectivity, maintain their desire for knowledge, and they will not be allowed to hurt their learning initiative and enthusiasm. At the same time, teachers should also note the students’ problems which are arising in the process of learning and treating, give students a timely and reasonable answer, help students solve problems which is meeting in the process of dealing with problems, and they will not let too many problems to while away the enthusiasm of the students.

If teachers are still do as traditional teaching process— only give the students a score, point out the shortcomings of the students, not say where the advantages and without any encouragement, or, totally negate the students’ done work when the results is wrong, for a long time, the students’ enthusiasm and initiative of learning will be disappeared.

4.2. Teachers should pay attention to maintaining objectivity and non-discriminatory in the evaluation.

Teachers can not put a premium on the solution way, because an issue is solved by a high-performing student, or by some team which is composed with some talented pupils, and ignore its shortcomings. On the contrary, when a number of issues are solved by the poor performance of students, they always pick on the shortcomings and ignore their advantages. If teachers are not maintain an objective attitude, only attach importance to high-performing students and ignore the poor performance students, the teachers’ image will be affected in the minds of students and against their enthusiasm.

4.3. Rational evaluation based on tasks with different level

In dealing with problems, some issues are very simple and students can resolve them immediately, meanwhile, the performance of students and the final results are very good in the process of problem-solving; some problems have a certain difficulty, students need to reflect and find relevant information, and the issues can be able to resolve. So, the students’ performance will vary, study results will be inconsistent; and there are some issues on the part of a very difficult problem, even if teachers have given the proper suggestion, students also need to find more information, and students need to use group learning format in order to spend short time, so that the students’ performance and the final effects is completely inconsistent.

Therefore, in this case, we need teachers make a reasonable evaluation according to the different problems in difficulty degree. Before the evaluation, teachers can make some scale, in accordance with the scientific method to set the content of the scale, ultimately give the students a more objective evaluation.

4.4. The evaluation of teachers should not be ignored.

Information technology in the constantly evolving, some knowledge may be updated over a period of time, therefore, the teachers who are engaged in information technology education need to spend much more effort to learn some of the new knowledge, such as: the emergence of some new term and new technology online and so on. At the same time, the present students have many opportunities to access to computers, they will encounter this or that problem, and some issues need teachers to pay more attention to access to the Internet can be resolved, so that teachers have to constantly update the knowledge of minds.

At the same time, we should pay attention to the evaluation of students while doing well in teachers’ evaluation, including student evaluations of teachers, mutual evaluation of teachers and teachers’
self-rating. Because, through teacher in class and contact with teacher, students and other teachers can stand in an objective point of view and give a reasonable evaluation.

In summary, teachers using the inquiry learning approach in information technology teaching, they should combine with the characteristics of information technology teaching and inquiry learning, and pay attention to cultivate the level of students’ inquiry learning. At the same time, through the use of evaluation of the inquiry learning approach in information technology teaching, students can find their inadequacies, be encouraged to participate more, enhance their practical ability and experience the joy of success.

References