Discussion of the Task-driving Teaching Approach Applies in High School Information Technology Curriculum

Xiaolu Ye[1, a]

[1]Sichuan University of Arts and Science, Dazhou, Sichuan 635000, China.

[a]yexiaolu0396@163.com

Abstract

Task-driving approach is a crucial and major teaching method for improving the teaching of IT curriculum. This kind of teaching method can motivate students' learning enthusiasm and initiative. Besides, it is of benefit to students cultivating the ability to resolve problems and think actively. The article discusses the task-driving teaching approach from its features and the process of how to establish efficient teaching of high school IT courses. Analyzing the subjective and objective factors which has influenced the "task-driving" approach and problems might exist when teachers use the method according to students' traits. Applying the method to high school courses, the given taskes are required to satisfy students' special requirements. And only in this way, can the class be more efficient. Under the guidance of teachers, students will gradually finish tasks from simple to complex. It is of vital importance to use the method via vivid ways, letting students be more interested in the class and improving the efficiency of teaching.

Keywords

Task-driving, Information Technology,Teaching Approach.

1. What's the Task-Driving Teaching Approach?

The task-driving teaching approach can be used in the class basing on experimental, practical and effective teaching contents. The purpose is to create an intriguing atomophere raising students' curiosity and interests. On the basis of it, combining the teaching content to help learners obtain skills and knowledge by finishing specific tasks[1].

The method advocates teachers hiding the teaching content in one or several tasks and centering the teaching content on finishing the given tasks. Teachers will lead students to accomplish those tasks from simple to complex, helping them find a clear thought to solve and learn knowledge from it. Besides, abilities like analyzing, resolving matters and handling information with the help of computers can be developed through the process. Currently, fundamental characteristics of the task-driving teaching approach have already formed as "task-oriented, teachers guide and students achieve."

2. Traits of the task-driving teaching approach.

Task-driving teaching approach can raise students' curiosity and interests, motivate their interest in study. To let the high school IT education become more practical and helpful, teachers are required to make use of the method, leading students to learn and think by themselves. As a new and innovative teaching pattern, it is required teachers shifting the traditional "teacher-oriented" mode to "student-oriented", and focusing on developing students' ability of team work and consciousness of study on their own. In this way, students' thinking ability can be improved. As for teachers, they organize, guide, help and promote students to accomplish tasks through the teaching process. They create a learning environment which inspires people to cooperate with others and talk freely, mobilizing students' initiative and

keeping them being positive. Thus, students can be more creative and give full play to their initiative.

Educators should shift the traditional knowledge-oriented teaching pattern and stress the importance of developing a positive learning attitude. For students, tasks should be interests or "catalyst" which can boost them study more actively, and they may have a sense of achievement by finishing them. Neverthless, traditional education regards teachers as the center, thus students are less importance than teachers. It only requires students following teachers thinking pattern and knowing the basic knowledge of the textbook. Yet in such teaching mode, students are passive to learn. The universal cognition of the traditional teaching is that learning and doing are two independent parts. Also, the acquirement and application of knowledge are irrelative. Students have to learn firstly, and they can only handle relative problems after learning.

Paying more attention to the process of acquiring knowlegde and the development of students' abilities, which is also a distinct comparison of traditional teaching methods. Teachers should combine their teaching content together and design some questions which deserve to be thought and researched. First of all, students need to analyze and solve tasks on their own. During the whole process, teachers can provide assistance for students, leading and organizing them to disscuss and work with others. Teachers should remember that assistance they provide shouldn't hamper students thinking independently but promote their research process.

3. Theoretical Backdrop of the Task-Driving Teaching Approach

3.1. Constructivism Learning Theory

From the perspective of the constructivism learning theory, learning always connects to specific situations. Constructivism learning theory highlights the significant of learners themselves and the initiative, socialization and situational of study. It is reckoned that study is a process for learners constructing their own knowledge system. That is to say, learners are not passive to accept but to select and process external information positively, and analyzing meanings of the information on their own. External information doesn't make any sense on itself, hence its meaning cannot be decided by itself too. The meaning is established by learners combining the old and new experience, working over and over again. On the basis of the original experience, each learner will code for new information, forming their own new understanding. Because of it, their original knowledge may be modulated and altered. Consequently, it is said that information is not just accumulation, but includes the conceptual and structural recombination which casued by the clash of the fresh and original experience [2]. Therefore, designed tasks for IT courses should give full play to computer comprehensive abilities to deal with various information such as graphics, pictures, animation, videos, sounds, characters, languages, signs and etc. Teachers need to devise some tasks based on special situations covering sounds, colours, images and the process, letting students can explore and practice independently, and inspiring their imagination and jugdement. Therefore, they may have sophisticated insights towards the knowledge and their hands on capabilities can be improved.

3.2. Humanistic Learning Theory

Humanism can be traced back to 1960s as a movement and school. It wants to become a science connecting to human-beings. People believe that psychology should discuss a whole person, not just have a scattered and reductionist analysis from subordinate aspects. The common faith of humanists is that everyone has ability and energy developing their potential. Consequently, they pay especial attention to self-actualization. Individuals can freely choose the direction and value of their own development, and be responsible for their choices. Carl Ransom Rogers, a representative of the humanistic psycology, considers that human-beings are born with aspiration and potential to learn. This is a trustworthy psychological preference which can be

released under the right conditions. When students realize that the learning content and their needs are connected, the enthusiasm for learning can be inspired easily. And people can learn better in an environment to fulfil their needs of psychological security. Rogers thinks that duties of teachers are not teaching students knowledge or telling them how to learn, but providing them means of learning. As for how to study should be decided by students. Educators should be a facilitator in students' learning, stressing the dominant position of students.

3.3. Theory of Multiple Intelligences

Theory of multiple intelligences was raised in 1983 by Howard Gardner, an American developmental psychologist at the Harvard Graduate School of Education at Harvard University. It was a new theory of human intelligence structure, which thought that human mind and cognition were diverse. In other words, multiple intelligences existed in the world. Gardner believed that everyone was born with varied intelligence, strong or weak. And they presented in different activities. Thus, personal intelligence was not easy to be measured and it also could not be completely recorded by pens. Based on a certain value standard of the society and culture, intelligence was the required ability people used to solve difficulties or to create effective products. He also emphasized that to judge a person's intelligence depends on his capacity of handling problems and the creativity in a natural environment [3]. Similarly, students with distinct characteristics would have multifarious intelligence combinations. Analyzing students' characteristics and then made education plan targeting these features. In this way, their learning abilities could be greatly promoted.

4. The Process of Constructing Effective Task-Driving Teaching Approach

4.1. Proposal of Tasks

In the actual teaching of high school IT courses, teachers should establish effective "task-driving" teaching mode, according to real situations. Then they need to create perticular situations and propose tasks. In the task-driving teaching approach, tasks are the key of series of teaching activities. Accoding to create a situation with problems, teachers can hide the teaching content into tasks. And students can acquire the knowledge by finishing these tasks [4]. Students enjoy exploring, so educators can make full use of this trait, creating a special situation, and letting students raise questions by themselves. Creating a "confusion" atmosphere bases on the knowledge, experience and eagerness of learning that students already have, motivating their enthusiasm of study. In this way, the learning positivity and initiative of students can be increased and help them engage in teaching activities more actively. During the teaching process, teachers should build effective task-driving teaching approach on the basis of actual situations, constructing the real learning situation and leading learners with real tasks to join in those study activities. When designing the high school IT courses, it is important to make full use of the information functions of images, animation, sounds, and videos, design some tasks besed on certain situations and students can explor by themselves. Through this, their study can be more visualized, meanwhile it also inspires students' original bacground information, establish a new knowledge system.

4.2. Analysis of Tasks

After tasks are given, teachers should give students time for discussion, then guide them analyzing problems hiding in those tasks, and finally helping them gradually solve all questions, rather telling them the right answer right away [5]. New knowlegde which was hid in tasks came up with by students would be better. Because it can not only create an active atmosphere for the class, but also enhance students' curiosity towards new knowledge. Driven by the curiosity and with the help of teachers, students can explore methods to learn spontaneously. In the teaching process of IT curriculum, teachers are organisers and commanders. When facing

problems, teachers shouldn't directly tell students how to solve them, but provide learners some clues such as where to find relevant resources. Students can clearly discover ways to solve problem like this, and thus they can successfully accomplish these tasks.

4.3. Completion of Tasks

Students, as the major part in the process of finishing tasks, should be free and courageous to deal with problems. As for teachers, they just play a role as helpers and leaders, encouraging learners constantly and offering them help in time. In IT courses, teachers can ask students to explore activities by themselves. Centering on the given tasks, learners can study with them [6], give full play to their initiative, look up information and try to deal with tasks. In such process, they may make a success or fail, but they can have the right understanding towards knowledge, the application of knowledge and the construction of meanings, and eventually questions can be resolved.

4.4. Comments of Tasks

After students finishing tasks, educators need to organize them sharing their experience and summarizing their accomplishments and reasons. In the class, students finish different stages of tasks and gain various results, according to this, teachers give different comments. Not only help teachers know clearly how much students learnt, but also give guidance to next stages of missions. However, educators should remember that comments need to protect students' pride and confidence, and use praiseful words to compliment their excellence and inspire them, helping them keep a good attitude towards study [7]. Comments have plenty of methods such as self-evaluation, student-to-student evaluation and teacher-to-student evaluation.

5. The Subjective and Objective Influencing Factors of the Task-Driving Teaching Approach in High School IT Curriculum

5.1. Analysing Characteristics of High School Students

One question has to be raised if teachers want students to perform well in IT courses: Why most high school students enjoy using computers but they dislike attending computer courses? To find the answer, we need to analyze and solve the problem from the characteristics of students. Just like doctors cure patients, we can only achieve that by understanding symptoms of students totally. Scientific researches about study consider that universal guidance can obtain optimum results only by combining to students' personalities and different mentalities.

5.1.1. Analysis of Students' Physical and Mental Features

Psychological research shows that the development of physiology, psychology, morality and other social consciousness of high school students clearly demonstrates imbalance. Such imbalance decides the development of individual's personality and expansion capacity of morality and soical consciousness. But from another aspect, it also causes conflict in the process of high school students' psychological development, making them demonstrate turbulence before maturing. With the growth of their age, the self-consciousness of high school students enhances obviously. Besides, their abilities of independent thinking and handling matters are also developed. Therefore, students' psychology and behaviours become more independent. So they no longer want to be treated as child and try to get rid off parents' protection and restriction. High school students thirst for knowlegde eagerly, and the wonderful life outside attracts them very much. If people cannot take high school students'mental characteristics into account and just restrict them, chances for them to reach their potential will be missed. That is not good for their development.

Although high school students are active, their abilities of self-control are quite good due to the growth of age. Thus they are easy to be led by others. Additionally, their curiosity is strong, but because the matured mentality, they will follow teachers' instructions. They know more about

the outside information, but due to their mentality is between semi-matured and matured stages, they still hope for teachers' attention. Consequently, teachers should know more about them, such as their families, studies, personalities and psychological features. Rencently, high school students' study load in subjects like English and Math are too heavy, so they think that IT courses are setting for them to relax. Educators cannot add more burdens to them while they are in spiritual relaxing. Thus teachers are required to pay more attention to the design of the task-driving teaching approach. The design should try to attract students' attention of learning on the basis of the teaching content. It is better to connect people's daily life with information which happened around.

Before high school, many students were regarded as child in front of their teachers. Hence they hope for having characteristics drawing people's attention. Consequently, when they accomplish tasks successfully, educators should praise them. Though part of them haven't done well, they also need to be praised in case eliminating their positivity towards study, helping them grow up gradually.

For example, when teaching high school students how to make simple animation, teachers, to attract their interests, can play a funny video or life-based animation before starting the class. Students will listen to teachers and learn more when they focus on the class. Or when assigning tasks to students, educators can ask them to create an ideal work, according to knowledge and techniques they've learnt and materials given by teachers. The types of the materials like pictures and videos should be as more as possible. Because many girls like cute and abstract images but boys enjoy spotive and violent figures. Besides, students can search from the Internet, developing the ability of finding information while learning new knowledge. So when using the task-driving teaching approach, teachers should consider students' features, assigning tasks properly. It is good for students acquiring theoretical knowledge and cultivating technical skills.

5.1.2. Analyzing Cognitive Characteristics of Students

According to cognitive-developmental theory of Jean Piaget, high school students belong to the fourth stage of formal operational stage. This means individuals' ideation reaching a matured phrase. Perhaps they will gain more things later in their lifes, but the added things can only be the increasing knowledge rather the ways of thinking.

Cognitive Learning Theory shows that the learning process of IT is reciprocal inflence between the new learning content and the original cognitive structure of students, forming a new information technological cognitive structure. Therefore, the threshold of learning activities should be the cognitive structure that students already have, and the culmination of it should help students build an excellent information technological cognitive structure.

For instance, teaching students knowledge about establishing websites may use many materials such as photos, sounds, videos and animation. Thus when assigning tasks for students, educators can advise them using software that they have learnt to deal with images that they like and suit for establishing websites. Or using audio software Cool Edit Pro, video software Premiere and animation making software Flash that they've already learnt to make videos, sounds and animation that they need. In this way, students can learn new contents on the basis of the original knowledge and combine the two, forming a new knowledge structure.

5.1.3. Analyzing Self-Learning Ability of Students

Self-learning is an ability for students gaining, exploring, creating and applying knowledge. It is a whole composed of different abilities according to specific structure. The ability of self-learning of high school students are more complex than pupils and junior high school students. Reasons are as follows: high school students can make study plans and decide their goals by themselves; realize the original knowledge and technique structure, control the learning

process; have cognitive ability and know self-regulation mechanisms as methods, habbits and activities of self-learning.

While cultivating students' self-learning abilities, educators should also emphasize the importance of thinking. Helping students establish a complete self-learning structure, making it play a role in self-learning and laying the groundwork for their development in the future. Meanwhile, the spirit and abilities of self-learning should work together. If students don't have any motivation or interest in independent study, haven't acquired any successful experience from self-learning or don't have perseverance, the activities of self-learning cannot be maintained.

When preparing for the task-driving teaching approach, teachers should make plans from the two aspects. They need to systematically understand characteristics of students and the teaching content, design tasks that suit students and perfect the process of finishing tasks. In this way, the flexibility of students' cognition can be enhanced, and combine information technology with the common sense of life as a whole. The integrity of students' cognitive structure have improved because of it, thus the analysis of problems and thinkings of solving will be more clear, and the teaching efficiency can be greatly improved.

5.2. Analyzing IT Curriculum of High School

The main purpose of IT curriculum is to help students obtain abilities of gaining, transferring, handling and applying informathion, cultivate excellent information literacy and regard IT as a measure helping them study.

5.2.1. Analyzing High School's IT Textbook Based on The Task-Driving Teaching Approach

The textbook of IT is a significant teaching materials, and on the basis of learning knowledge and skills of IT, covering knowledge and capacity, process and methods, emotions and values. At present the high school textbook of IT is designed on the basis of common work of theory and practice. Additionally, it also regards the application of IT as the key, and use the task-driving teaching approach dividing knowledge modules into apart according to the degree of depth, the difficulties, and the acceptability. Putting the related content together, and keeping learning towards harder and more complex contents a long time later. In this way developing their teaching, students can find an excellent combination between knowledge and skills.

Textbooks of IT get used to starting from rationales and concepts, then integrate them abstractly and stress the importance of classifying subject knowledge systematically. Contents of texebooks focus on unifying the basic, stability and development together. As for choosing the software, there is no need for teachers to mention the operation methods and details of software. Students can find out many ways to solve different problems and learn how to use various similar software by themselves.

5.2.2. Analyzing the IT Classes of High School on The Basis of the Task-Driving Approach

Different from other subjects, the teaching process of IT courses surmounts traditonal patterns of teachers talk and students listen. It focuses on the development of students. In the class, the time for students learning by themseves is much more than teachers' teaching. The teacher is no long in the dominant position but play a role as a promoter and guider. Modern IT classes generally use the task-driving teaching approach. It was widely accepted by teachers and students as it encouraging students finding and solving matters on their own, enhancing students' operational capacity.

6. Questions Need to Pay Attention to While Implementing the Task-Driving Teaching Approach According to Students' Characteristics

How to ask students to engage in activities of the IT classes positively and inspire their initiative and enthusiasm? To resolve the problem, teachers are required to spend more time designing suitable tasks while using the task-driving teaching approach, meanwhile, cultivate students' consciouness of active participation. Educators should care about students' feelings and divide different level's tasks according to the mastery of knowledge when designing tasks. Furthermore, taking their ages, interests, existing knowledge and cognitive capacity into account is also very important. Things need to be careful while designing:

6.1. Authenticity of Tasks

Tasks should be real rather fictive. For instance, asking students to make a greeting card. Tasks can be: using the knowledge they've learnt and materials provided by Internet software to insert a fashion and beautiful picture; inputting characters and transforming its colour into different hue and typeface. Motivating their strong thirst for knowledge through real tasks and inspiring them to study with an positive question exploring attitude.

6.2. Maneuverability of Tasks

IT is a practical curriculum. Students can only understand and like it through operating by themselves. It seems quite easy to finish tasks while watching teachers analyzing and operating. However, students may feel how difficult it is by doing it on their own and they will confront with problems. Teachers, while designing tasks, should pay more attention to the maneuverablity of tasks.

6.3. Rationality of Tasks

Considering the size and difficulty of the task. Besides, Selecting the key points and difficulties and paying more attention to them. Learning information technological knowledge is a process of the gradual accumulation. The information technological bases of each student is different, so their acceptance capacities are also different. If tasks are too hard, many students cannot finish them in time. Consequently, knowledge in each task should be no more than two.

6.4. The Connection Between Tasks

Tasks should be connected. And it is better to be echoed. In the process for students finishing tasks, they can start with observing and thinking, then analyzing, and finally make a proper conclusion. Transferring from outside phenomena to the essence and from rationality to sensibility.

7. Conclusions

Applying the task-driving teaching approach in teaching for high school IT curriculum, teachers should think more about the characteristics of modern students while designing tasks. For example, different methods for students' information processing; different demands towards learning environment; differeces in cognition; tendency factors of individual's awareness and ect. The class efficiency can be improved only on the basis of tasks fulfilling the modern students' requirements. With the guidance of teachers, students can gradually accomplish tasks from easy to hard and from easy to complex. It is of vital importance to use task-driving approach, make the teaching content become more vivide and interesting since it can improve the efficency of teaching.

Reference

[1] S.Q. Guo: The Connotation of the Task-driving Teaching Approach, China Educational Technology, vol.234(2006)No. 7, p.57-59.

[2] X.H.Chen:Modern Educational Technology(Beijing University of Posts and Telecommunications Press, China 2009), p.29-33.

[3] X. Zou: The Foundation of Modern Educational Technology(China Water&Power Press, China 2009), p.69-70.

[4] L.P. Niu: A Preliminary Study on Task-driving Teaching Approach, Journal of Anhui Institute of Education, vol.21(2003)No. 6, p.109-110.

[5] H.Y.Zhang: Application of Task-driving Teaching Approach in Information Technology Teaching, Scientific & Technical Information of Gansu, vol.39(2010)No.3,p.28-29.

[6] Z.F. Liu: Application of Task-driving Teaching Approach in Information Technology Courses, Western quality education, vol.(2018)No.2,p.246.

[7] K.T.Zheng: Exploration of Task-driving Teaching Mode, Forum of Contemporary Education vol.(2008)No.8,p.115-117.