

# Effective Use of Online Learning System in Creative Teaching for Architecture Computer Module

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**Abstract:** Creative teaching in the age of rapidly developing information technology is a major problem of concern. The problem is how to develop the capacity and creative thinking for students while a wide range of knowledge is increasing rapidly and the classroom learning time is decreasing. This article provides a model of creative teaching through using an effective online learning system for the computer architecture module.

*Keywords:* Creative teaching, Online learning system, creative online teaching, computer architecture.

## 1. Introduction

### 1.1. Online learning system

Together with the development of information and communication technology, many online learning systems for different subjects have been built on the open Moodle source. This system is used to support teaching and has obtained initial certain success. However, in order guarantee these systems promote high efficient and adapt to current teaching practices, these problems are raised: How to carry out online teaching system? How to use this system in teaching? These questions will be answered in this article.

Which system [1, 3, 6] is built as a website. In the website, teachers can give electronic lectures to the students to self-study at home. Using multiple choice tests to examine regularly and periodic assessment of students' self-studies at home; examine and evaluate the

student's learning at classroom with highly interactive quite; the test results is automatically processed and saved to the subject scores. This system is suitable for individual assignments, group exercises and students can submit their homework online, they also can exchange information online and discuss regularly with teachers through forums and meetings online. In addition, this system also can be used to organize for middle and final term exams in the form of quizzes online.

### 1.2. Creation, creative capacity

#### \* Creation

"Creation is a kind of activity that its result is mental or material product with innovation, social significance and valuable"[2].

In detail, "Creation is an activity creating unprecedented new ones in nature or in society. These new ones have to bring the benefits and effectiveness for humans".

In teaching, creation is distinguished into two levels: Create something new just for themselves and create new ones for humanity.

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\*Creative capacity:

"Creative capacity can be understood as the ability to create the value of physical and mental to find out new things, new solutions, new tools and apply successfully knowledge in new situations".

In other words, "creative capacity is the ability to create new ones to meet the demands of life which by the experience is not enough", "creative capacity is reflected in the ability to solve practical problems in the daily life".

### 1.3. Creative teaching

The creative teaching can be considered as the following [2, 5]:

- The process of teaching is focused on the objectives of capacity development and creative thinking of students.

- Raising the issue of teaching methods for students rather than teaching academic content. Paying more attention on how students will learn?

- Ensuring the integrity of teaching process. Creating more opportunities for learners to participate.

- Using various methods, forms of organization, facilities and teaching materials.

- Spending more time for application and communication activities, working in small groups and solving problems.

- Enhancing visualization, multi-sensory teaching and multiple intelligences.

- More feedbacks to teachers

- Evaluation is based on the carrying capacity

- Creative teaching will help students to develop sufficient levels of cognitive thinking (Figure 1).

### 1.4. Self study

Self-study [7] is the process in which the learners are voluntary, positive, and active to learning objects to gain the knowledge, skills, and self-perfection. Self-study is an independent, personal process but effective self-study is not only dependent on the efforts of

learners but also influenced greatly from self-study training activities, from what the teacher designs to control and guide the students themselves to dominate the knowledge, train skills so that they can learn throughout their whole life. For the self-study to be effective, the E-learning system which provides learners with electronic lessons' content visually and vividly and give the questions for which students have deep understanding and practical application.

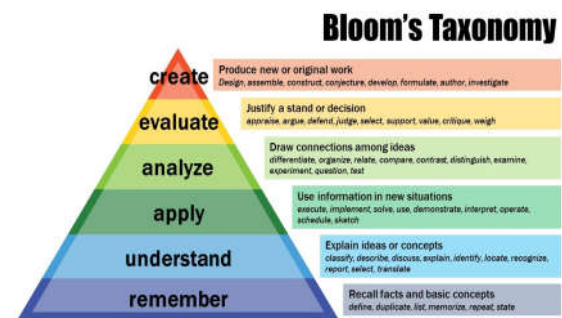


Figure 1. Bloom's Taxonomy (2001).

From the above analysis we have found that it is necessary to use the online learning system in teaching. However; the design and implementation of the system which motivate the self-learning capacity and improve learners' ability as well as creative thinking of students is the issue to be solved in this paper. A model of creative teaching by using an effective online learning system for teaching computer architecture is presented hereby.

## 2. Contents of the study

### 2.1. Organizing online learning system on architecture computer module

Our online learning system is designed at <http://khanhmckm.com>. A system of e-learning with the open source Moodle is built, including online courses organized in modules or theme module. The system consists of the online test, teaching materials, academic forums, online conferences. In addition the system can also keep track of the learners' record; grade

automatically and save the result in the records of students (Figure 2).



Figure 2. The system of online learning Architecture Computer Module.

Each week corresponds to a lesson with 3 periods, including the following parts:

- Self - study lessons at home week i
- Tests to evaluate on self-study of students at home weeks i
- Tests on early period lesson week i
- Online meeting weeks i
- Online exam week i
- Discussion forums/individual assignments weeks i
- Group exercises weeks i

a. Self-study lessons at home weeks i

Electronic lectures are designed according to the SCORM standard, with 11 lectures per 11 weeks. This lecture is opened regularly to help students understand the basic content of the previous lesson before attending class. Students can learn anytime and anywhere just by tablet or phone with internet connection.

b. Tests to evaluate on self-study of students at home weeks i

This test is in the form of multiple choice test consists of 20 questions overarching all lesson contents, which are required the thinking knowledge and understanding of learners.

After self-studying carefully lessons at home, students use these exercises to test their knowledges. 10 minutes is the time set for these exercises and always in open mode, students can practice again and again, the results will be evaluated by the computer system, and the scores (the average score per each test done) and saved to the scores of student records. By using the average score of the number of times test is the final score to assess that will push the students to more practice if the scores of previous times are lower. Through this exercise will help students to remember and understand thoroughly the lessons' contents.

Storing the students' results through the system will help teacher to find out the students who do not participate in learning at home to timely remind and correct the students' learning.

c. Tests on early period lesson week i

We use 5 multiple choice tests to examine randomly for 5 students in early period, each test has 5 questions taken randomly from 20 questions of students' self-study assessment exercises at home and the time for this test is 2 minutes.

This exercise is used in the early period lesson in classroom to examine the student's self-study at home. By comparing the results of the students after the test in this exercise with the results of the students' results at home to find out who do their homework for themselves or who ask their friends to help them so that the teacher will timely remind and correct the students' learning.

d. Online meeting weeks i

Teachers use online meeting to organize discussions with students in fixed time to clarify the issues that are not clearly in class. The time for the online meeting is 1 hour and it is often hold cleverly just before online exam week i. The content of the meeting can focus on the problems that teachers intend to test in online exam to attract students' participation.

e. Online exam weeks i

This exam is in the form of multiple choice test with 40 questions in 30 minutes and the

questions' contents included: 20 questions of self-assessment section for learning at home, 15 questions of practical applications, 5 questions of the knowledge extension.

The construction time is determined by the teacher and held immediately after the online meeting placed. Students can participate only one time and the test's results are saved by the system, teachers use these results to assess the learning process of the students.

f. Discussion forums / individual assignments weeks i

Teachers give n ( $n >$  number of students in class) questions linked with reality that correspond to the content of lessons week i. Each student will choose one favorite question to answer but no one picks the same question then they will comment at least 2 answers from two other students at the same time. Students finish their exercises and submit them through online system under specified time (deadline for submission and the deadline for comments of the other student).

The questions selected will help students more interested in doing homework and choosing the questions that no one has chosen to promote all students submit their exercise as soon as possible to be able to select their favorite questions. In addition, giving the comments to these answers of the other students will help them to develop the ability in analyzing, evaluating and creativity in learning.

To demonstrate the creative thinking abilities of students when participating in individual homework we give the following example:

Example:

- Question: From Mainboard (Intel G31, DRam2, socket 775), select Chip (Dual core 2.0GHz/800/1M, Dual core 2.0GHz/800/2M, Dual core 3.0GHz/ 800/2M) and choose RAM (DRam2 1G/667, DRam2 1G/ 00, DRam2 2G/800) for the main to have triad Main-chip-Ram for the computer, and the computer is used for editor?

- Student A selects the question to answer

To answer the question students based on three conditions to assemble:

Socket main = socket chip  
Main bus = Bus chip  
Main bus = Bus Ram

Based on the device parameters that the question give for students to answer: Dual core chip has Socket 775 and all three chips above have bus 800 therefore all three chips can be mounted on Main, all three rams above have bus (667, 800 ) so all three are inserted into the Main. Selecting Dual core 3.0GHz/800/2M because the chip has maximum speed (3.0GHz) and L2 Cache memory biggest graphic (2M), it runs fastest. Select Dram2 2G/800 for the largest capacity. The students' results give trio configuration as follows:

*Main Intel G31, Dual core 3.0GHz/800/2M, Dram2 2G/800*

Students post their answers through the system, his classmates read his answer and comments.

- Student B comment:

The answer of student A is true but it is not the best option because the computer is used for text editor (lightly program) therefore it is not necessary to use high-profile chip (then excess performance computer and high cost), this student give another answer by replacing Dual core chip 3.0GHz/800/2M, Dual core 2.0GHz/800/2M:

*Main Intel G31, Dual core 2.0GHz/800/2M, Dram2 2G/800*

The student B gives a new assembly plan to still ensure the speed processing of the computer and meet the demand of the job as well reduces the cost in comparison with the cost in the student A's answer.

Student B posts his answer through the system for all classmates to read and give comments.

- Student C comments:

After reading all the answers of student A and B, student C commented as follows:

The student B's option is better than student A's option but it is not the best plan because: With the use of text editing software without high-speed chip in addition it is no need to have the large L2 cache (the more L2 memory chip bigger the more expensive the cost is) and this is a slightly program so it does not need RAM memory and just need to insert Ram 1G (the cost of 2G Dram2 is twice expensive as the cost of Dram2 1G) is sufficient. Student give a new answer: Instead of using Dual core chip 2.0GHz/800/2M, Dual core 2.0GHz/800/1M student C uses Dram2 2G/800 a Dram2 1G/667.

*Main Intel G31, Dual core 2.0GHz/800/1M, Dram2 1G/667*

So students C has launched a new plan on the assembly while still ensuring the speed processing of computers that meet the demand of work and reduce the cost in comparison with the cost in the student B's answer.

Student C posts his answer through the system for classmates to read and give comments.

- Student D comments:

After reading all the answers of student A, B and C, students D commented as follows:

The answer of student C is so good because it ensure the lowest price and maintain the configuration for the job but it still does not ensure the integrity of a computer system (bus main=bus chip = bus ram), thus leading to reduce the performance of computer, the student D's answer is replacing Dram2 1G / 1G by Dram2 667 in / 800.

*Main Intel G31, Dual core 2.0GHz / 800 / 1M, Dram2 1G / 800*

This is the best answer to that question, the answer is based on the knowledge students' remember and understand through online lectures, ability to apply, analyze and evaluate through lessons in class. Students have to apply to individual assignments and especially on the basis of the analysis to lead to your answer, with the

creativity of the students have found the best answer for every problem posed in practice.

Both the results of the answers and the analysis to lead to the plan are all absorbed. Similar to the other questions. Here the online system switched the teacher to help students acquire knowledge and creative learning.

Moreover, through the forum the teachers answer students' questions which are not answered in online meeting. There fore the teachers can find out the students' difficulties in learning to take timely support to them. Teachers can use the forum to get the feedback from students about their teachings' organizations to adjust accordingly.

g. Group exercises weeks i

The group of students do exercises at home under the teacher's requests and then send them as files via the online system with the specified time. Also each student must send a ballot email to the teacher to assess students' activities in group with other students following the form (Figure 3).

<b>Assessment group activities</b>	
Students fill out this form and return it to the lecturers via email	
khanhmckm@gmail.com	
Information provided will be kept secret	
Full	name:
.....	
Group	member:
.....	
During the discussion process, you and other members of the group:	
1. How is the cooperative attitude of each member in group towards common goals (select an option)?	
No cooperation	No real cooperation
Cooperation	Good cooperation
.....	
2. How is the work of the group splitted?	
- Poor, only 1 or 2 students participant	
- Fairly stable (most of the members are involved)	
- Good (all members are involved)	
3. What is the strength of your group's	

activities?  
 .....  
 .....  
 4. What do you think your team need to improve if you do this exercise?  
 .....  
 .....  
 5. If you have 100 points and you have to divide these scores for each members according to each member's contribution to the overall results of the group, Who will you give the scores? Please explain why you give a such division score (not scoring for yourself).  
 1 ..... score  
 .....  
 2 ..... score  
 .....  
 3 ..... score  
 .....

Figure 3. Assessment group activities.

Through group exercises will help students to develop thinking ability and teamwork and by using stock to assess group activities will help teachers assess accurately the results and reduce the dependence complaints of students participating in group exercises.

Teachers grade assignments, the student results are based on the scores of group activities and the score of self-assessment through group activities. Teachers send score for students in team.

2.2. Using online learning system in creative teaching

a. Using the online system to teach at the level of remember and understand in cognitive thinking

The use of self - study lessons week i, students' evaluating tests on self-study at home week i, tests on early period lesson week i in the system have helped teachers to convey basic knowledge in remember and understand form of courses fully. Because learning can take place anytime, anywhere, and not restricted in terms of time so that all students will absorb knowledge and the comprehension process

taken faster or slower is depend on the capacity of each person.

b. Using the online system to teach at the level of manipulation, analysis and evaluation of cognitive thinking.

The teachers' lectures in class use some positive teaching methods combined with online systems such as document [4] in an appropriate manner to enable students to apply in practical and develop their ability in analysis and evaluation. Especially the use of exercise tests week i to evaluate students after each lesson help the teacher to assess the students' abilities in applying, analysis capacity and assessment.

c. Using the online system to teach creative level of cognitive thinking

Teachers use online systems to ask students to do individual assignments as mentioned above, with the results evaluated by the following criteria: 60% points for answers the questions and 40% points for evaluating the comments of the students' answers. This evaluation has developed creative thinking and capacity of the students. Teachers post the assessment results to students via the online system.

These group exercises have gained manipulate activities, communication and many feedbacks to teachers. Through group exercises students will have more ability in coordination and organization of practical in later, this is one of the most important elements posed in creativity teaching.

With two types of exercises completed above after each period in the classroom have created more opportunities for learners to participate, this is one of the prerequisite conditions to develop thinking ability and creativity of learners in creative teaching.

d. Using the test systems for the midterm and final term

The subject is divided into 11 articles corresponding to 11 weeks of online learning systems. There are 40 questions (assessment exercises week i) with the level of difficulties mentioned above for each week, thus at the end of the course there will be a question bank with

440 questions. Teachers use the question bank to give the multiple choice test for midterm and final term.

The school organizes test in the online room according to the schedule with the supervision of the supervisors. Students sign into the system and obtain a test preinstalled. Results will be evaluated by the system and used as students' results.

#### e. Assessment of learning results

Under the provisions of the assessment results according to credit module consists of four types of points: The process score: 10%; essay score 10%; Midterm score: 30%; Final test score: 50%. Creative teaching is appreciated basing on the carrying capacity and we evaluate the score as following:

The process score = Average results of multiple choice tests, tests on self-study at home week  $i$  and assessment test weeks  $i$ .

The essay score = Average results of individual exercises week  $I$  and group exercises week  $i$ .

The mid-term score and the final exam score are the students' results in online room at the school.

### 2.3. The result assessment of the online learning system

Due to the framework of the article, we cannot present the experimental results, we use the qualitative assessment only.

**For students:** Due to regular examination and test, it can limit the cheating of students. Students are active in learning, they do not wait until the exams to study. The use of qualified electronic lectures, with choice tests, forums, individual assignments and group work has stimulated self-study ability and developed the creative thinking of learners.

**For teachers:** The suitable assessment of study result has estimated the right ability of learners. Especially, it can reduce the cheating of students when using the online learning system.

### 3. Conclusion

This article has analyzed and demonstrated the use of effective online learning system of creative teaching. Currently, this system is being used to teach combining (online and tradition) between architecture computer module and some other modules of information technology at the Viet tri University of Industry. With our research has contributed to improving the quality of teaching with the support of online learning systems.

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