Design and Effectiveness of Instruction model for learning, assessment and utilization in Smart Classroom

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Abstract: The traditional teaching mode and teaching activities in the smart classroom, still cannot change the teacher-centered situation. The instruction model for learning, assessment and utilization proposed in this paper can contribute to give full play to students' subjective initiative and make students become the dominant in the classroom. Firstly, the frame of instruction model for learning, assessment and utilization (the instruction model for LAU) is established. Then, activities for learning, assessment and utilization are designed. Finally, according to the instruction model for LAU, the teaching activity of the advertisement decision making of the WeChat circle of friends is designed, and the better teaching effect is achieved. The results from the teacher's interview and students' questionnaire maintain a high degree of consistency, verified that students in this instruction mode of classroom participation, mastery, satisfaction is higher than the traditional task of learning.

Keywords: Smart classroom, learning activities, assessment activities, utilization activities, instruction model

1. Introduction

In the educational policy of 13th Five-year of China, it points out that building the network, digitalization, individuation and life-lone education system is the key way for educational modernization. The smart classroom is a learning space that is built on ubiquitous computing technology, cloud computing technology and smart technology to promote students to build knowledge (HUANG Ronghuai., 2012).

2. Literature Review

The First Principles of Instruction proposed by Merrill(2002), is to achieve specific teaching goals, by solving the problem of gradual progress in the actual situation. Based on the double helix structure theory of the learning ability of B.J. McGettrick(2002), Lv Xiaojuan(2015) proposed constructing a flipped classroom teaching design based on the theory of student learning. This design makes use of the in-class time to allow students to explore independently, and communicate results. There still are lots of problems, except the above-mentioned teaching model. Firstly, it's easy to occur that students have insufficient pre-learning. Secondly, in the process of self-inquiry or cooperative learning, students with poor learning ability can't keep up with the class without teachers' attention. Finally, after class, it is prone to the lack of timely feedback on student work. So, this model is designed to deal with the above problems from learning, assessment and utilization.

3. Research Design

The Instruction Model for Learning, Assessment and Utilization (see Figure 1) proposed in this study is a teaching structure and teaching sequence that focuses on tasks to carry out learning. Learning, assessment and utilization are not only three independent structures and three activities, but also are closely related to each other and together constitute an organic whole. According to the different teaching goals, the focus of learning is to cultivate students' ability to understand knowledge. Assessment is to promote the generation of ability, and utilization is to expand the skills.
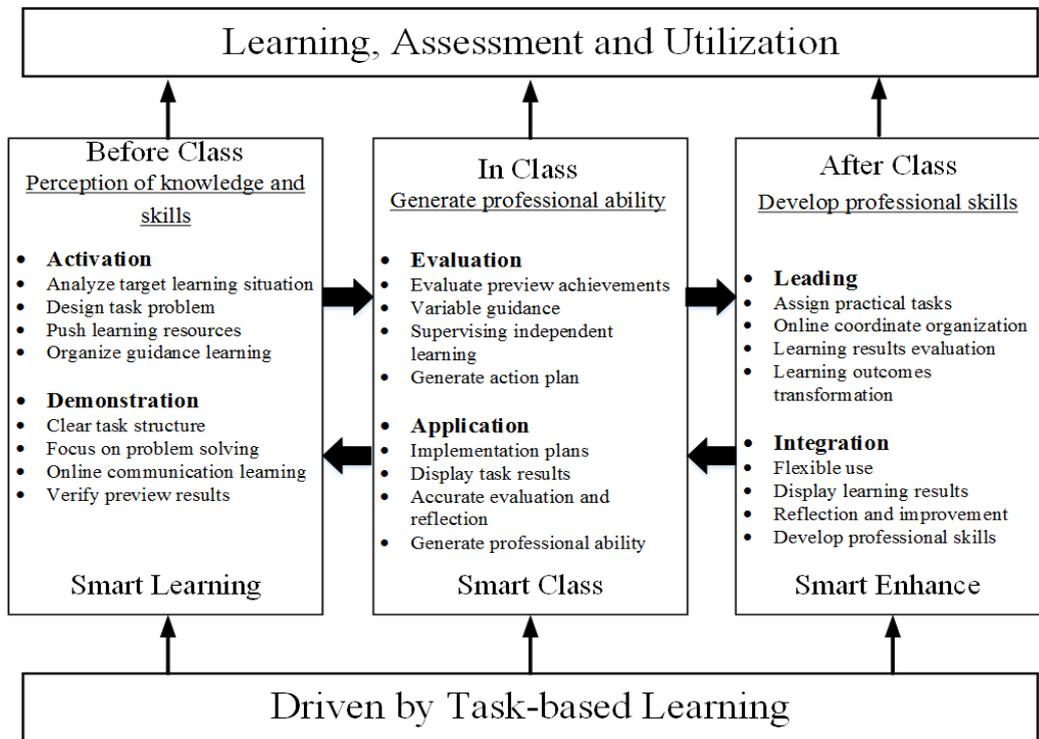

Figure 1 The framework of instruction model for Learning, Assessment and Utilization

The learning activities design runs differently through the entire knowledge learning process. In the before class stage, the teacher supervises students to use the e-learning platform to feedback their difficulties. In the class, teachers use the answer platform to test the students' preparatory results, and guide students to think positively through heuristic questions. In the post-classroom stage, it is necessary to design some explorative work to inspire students' interests. Classroom evaluation at any time can help teachers to master the students' learning situation, and facilitate teachers to implement targeted teaching (Jayahari K R, 2017). Once the Utilization activities is applied, teachers should create or simulate real-life situations and use smart questioning to elicit tasks (Jung Lim,2009). Each member needs to play a role to complete the tasks together (Pattison P,2016).

4. Case Study

According to the instruction model based on the smart classroom, this chapter will show an example of the teaching activities leaded by "learning, assessment and utilization" in a secondary vocational school in Shanghai. The instructional material is Advertising Decision-making in WeChat Moments. The students are divided into five groups according to the form of the simulation company. The wireless network of smart classroom is unimpeded, so that students can use their mobile phones to search information freely, publish the results of the program, and conduct online mutual evaluation. Questionnaire survey is designed to find out whether the model will be effective from four aspects. And whether there is significant difference between male and female (Almeida,2010) affected by this model. Interviewing with the teacher is based on the difference between traditional classroom teaching activities, and the students' participation and mastery. For the corresponding analysis item,

each of the "CITC value" is higher than 0.9, which indicates that there is a good correlation between the analysis items and the reliability level.

Table 1*Analysis of student questionnaire*

Research Dimension \ Comparation	Very Approval (%)	Approval (%)	Ordinary (%)	Disapproval (%)	Very Disapproval (%)	Mean Value			Significant (Y/N)
						Overall	Male	Female	
Environment	66.67	11.67	5.00	0.00	16.67	4.12	3.86	4.30	Y
Participation	56.67	20.00	6.67	4.17	12.5	4.04	3.86	4.17	N
Mastery	65.01	14.17	4.17	4.17	12.5	4.15	3.94	4.30	N
Satisfaction	67.19	10.94	4.69	4.69	12.5	4.16	3.91	4.33	Y

The statistical results of the questionnaire by five self-rating scale are shown in table 1. More than half of the students think that the smart classroom's environment, resources, and IRS give their "significant help". However, in the use of the IRS, girls' situation is significantly better than the boys'. 20% of the students think that learning activities design based on task-based learning needs to be improved.

The results of students' questionnaire and teacher's interviews are consistent, verified that in the environment of the smart classroom the students' cooperative learning with this model show better performance in participation, mastery and satisfaction than the traditional teaching.

5. **Conclusion**

According to the practical results, smart classroom provides technical support and guarantee for the realization of interaction between teacher and students, enriching the source of instructional resources. The design of learning, assessment and utilization instructional activities can lay the foundation for the realization of classroom education fair and learning program customization, etc. However, the number of samples is a little small and no future application in different majors and grades. Besides, there are drawbacks with the test to students that Hawthorne Effect exist.

Acknowledgements

Reference

Huang Ronghuai, HU Yongbin, YANG Junfeng & XIAO Guangde. The Functions of Smart Classroom in Smart Learning Age[J].*Open Education Research*, 2012, 18(02):22-27.

Merrill.M.D. First Principles of Instruction [J].*Educational Technology Research and Development*, 2002, 50(3):43-59.

B.J.Mc Gettrick. Emerging Conceptions of Scholarship [R].*Service and Teaching*. Toronto：Canadian Society for the Study of Education, 2002.

LV Xiaojuan. Flip classroom teaching design based on students' learning [J]. *e-Education Research*, 2015,36(12):98-102.

Pattison P, Russell D. *Instructional Skills Workshop Handbook* [M]. Vancouver: UBC Centre for Teaching and Academic Growth, 2016.

Almeida, Leandro S., et al. Intelligence assessment: Gardner multiple intelligence theory as an alternative. *Learning & Individual Differences* 20.3(2010):225-230.

Jayahari K R, Nair S P, Bijlani K. Solution for automating teaching environment setup[C] *IEEE*, 2017:122-127.

Jung Lim, Robert A. Reiser, Zane Olina. The effects of part-task and whole-task instructional approaches on acquisition and transfer of a complex cognitive skill. *Education Tech Research Dev* (2009) 57:61-77.