

Learning Management System for Project Based Learning via The Internet in Teacher Training and Teacher Education

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Abstract: The purpose of this study is development of the distance learning system for the teacher training and the teacher education that builds in the project based working by the group members' cooperation. The training program of the practicality was executed. As a result of the evaluation, it was suggested that the feature of PBL, that is the activity process, activity looked into oneself, and cooperative activity, have effectively acted on those who attended a lecture by "Activity guide" proposed by this research.

1. Introduction

The distance learning environment has been achieved by the development of the information-communication technology. Especially, there are a lot of one of the lecture style to transmit knowledge as for the style of remote study of the current state. However, the teacher each other in cooperation aims to solve the problem when thinking about the training of the ability to work effectively to the problem solving on the school education site, studying by the practice form is important, and being possible to do is important.

The teacher cultivates empirical knowledge through work cooperated with the colleague, and the ability of the problem solving is improved. Practicing study that bases such a problem-solving process is called the PBL(Project Based Learning), and has the following features[1]:

- (1) The non-structural knowledge world is treated;
- (2) The problem that is not an ideal solution unique the goal (settlement plan) is set;
- (3) The existence of the correct method, the procedure, and the conclusion (intermediate) is guaranteed in the activity process individual;
- (4) The restriction that should be considered when the solution is derived is set;
- (5) The participant to the cooperative study digs up the problem in the real world, and devises the methodology of deriving the solution voluntarily.

The cooperative work is inevitably built into the learning activity of the project base. Share the problem to which the learner who participated in the study of the project base was set by the teacher in this. And, clearly because the learner each other works for a common, target achievement, and a final product of the project (problem-solving plan) is obtained.

The purpose of this study is development of the distance learning system for the teacher training and the teacher education that builds in the project based working by the group members' cooperation. The training program of the practicality is actually executed and evaluated.

2. Design of PBL

We proposed to describe the PBL as a process of the problem solution as a constituting principle of the asynchronous type cooperative study. And, the process of the problem solution is expressed as "Activity guide" that was a kind of work flow.

The activity guide expresses the problem-solving process from setting the problem to the settlement plan (Another solution is included) as a search tree by the one that the teacher is forecast the learner's activity and designed.

The activity guide consists of the following four. Figure 1 shows the concept of the activity guide:

- (1) Description of the problem;
- (2) Description of the learning activity process;
- (3) Description of problem-solving plan;
- (4) Description of learner condition.

"Description of the problem" is a requirement, and a criterion that the theme, the goal of the solution, and the product finally obtained should be concretely satisfied.

"Description of the learning activity process" is what is made the problem detailed further by the teacher, materialized, and described with the sub-goal. The following three are described as a sub-target :

- (1) Method : The use of tool and media ;
- (2) Procedure : The learner's activity ;
- (3) Sub-Goal : The intermediate conclusion of result.

"Description of the problem-solving plan" is a product expected obtaining as a result of the problem solution that the professor person set up. The instruction the teacher's whether the learner being had to allot which activity process is described, "Description of learner's decision condition" ..

"Description of learner condition" is an instruction the teacher's whether the learner being had to allot which activity process.

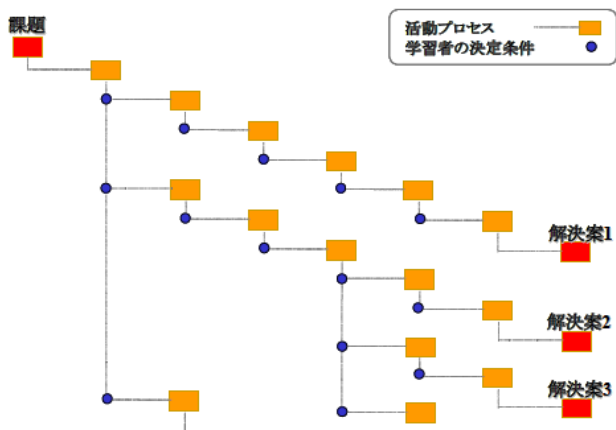


Figure 1. The concept of the activity guide

3. Practice and evaluation of PBL

3.1 Practice

The PBL program was executed for 178 people the undergraduate students in university of education. The separation project was united to the group of 4 or 5 person. The problem is making of "Tactics to the information school". If the content of this maneuver is described as an activity guide.

The concrete activity guide executed by the PBL lecture is shown as follows.

I. Problem

Theme: "Strategies to the Information School"

Goal: You who is the teacher will be ordered by the principal at my school, and investigate promotion of informationization. You visit, and interview the school reader about ICT (Information and Communication Technology) of another school. And, it decided to report on the result as "Strategies to The Information School". Please complete "Strategies to The Information School" according to the next step.

Requirement : Make figure where the strategy to informationize the school is understood at one view.

Criterion: Those who attend a lecture can analyze the factor to informationize the school enumerating it.

II. Learning Activity Process

Process 1.

[Method] The interview result is classified by using the factor of "Informationization of the school".

[Procedure] Please look over the record interviewed "school reader". Please assume this record to be a result of your visiting and having interviewed "school

reader" of another school. And, please write to read it from the interview record as a memo. The element of "Informationization of the school" is used for the item of the memo.

[Sub-Goal] Filling in to survey form

Process 2.

[Method] The relations between two factors of "Informationization of the school" are analyzed.

[Procedure] Please limit it to two factors among factors of five "Informationization of the school" in all to facilitate considering. And, please examine the relation between them.

[Sub-Goal] Description of two axis method illustration (matrix chart)

Process 3.

[Method] "Strategie to the Information school" is described in figure.

[Procedure] Please express "Strategie to the Information School" in pattern diagrams and complete it. The limited relation between two factors must be included in pattern diagrams.

[Sub-Goal] Pattern diagrams about "Strategy to the Information school"

III. Problem-solving Plan

Completed pattern diagrams of "Strategie to the Information School" and the explanation

IV. Learner Condition

1) About description of two axis method illustration (matrix chart) and pattern diagrams about "Strategy to the Information school", exchange opinions with others, and examine the validity.

2) About pattern diagrams about "Strategy to the Information school", each one must complete the original one.

LMS (NEC i-Collabo.Learning) had been introduced by this learning was used for the presentation of the problem, submitting the product, and the message switching between learners.

Figure 2 shows the screen image of LMS. Figure 3 and Figure 4 shows a work of students who attend the lecture. Those works are submitted by the electronic file.

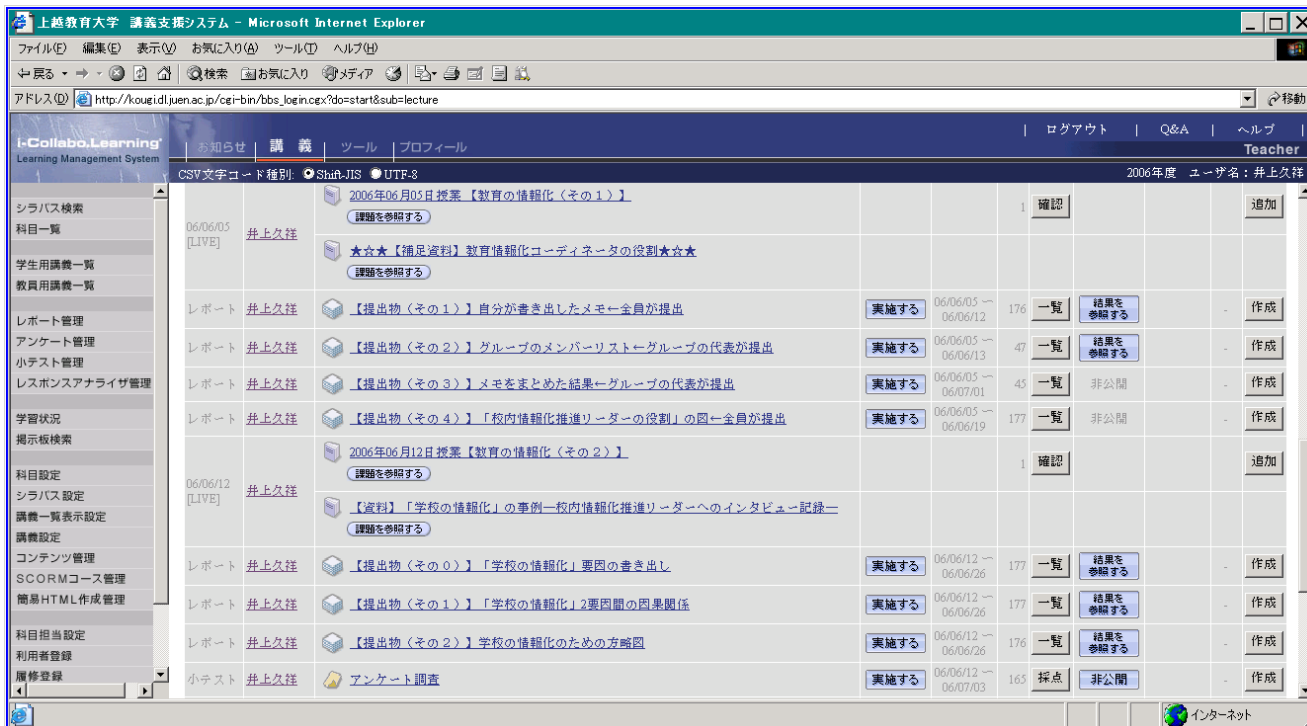


Figure 2. Screen Image of LMS

二要因間の因果関係

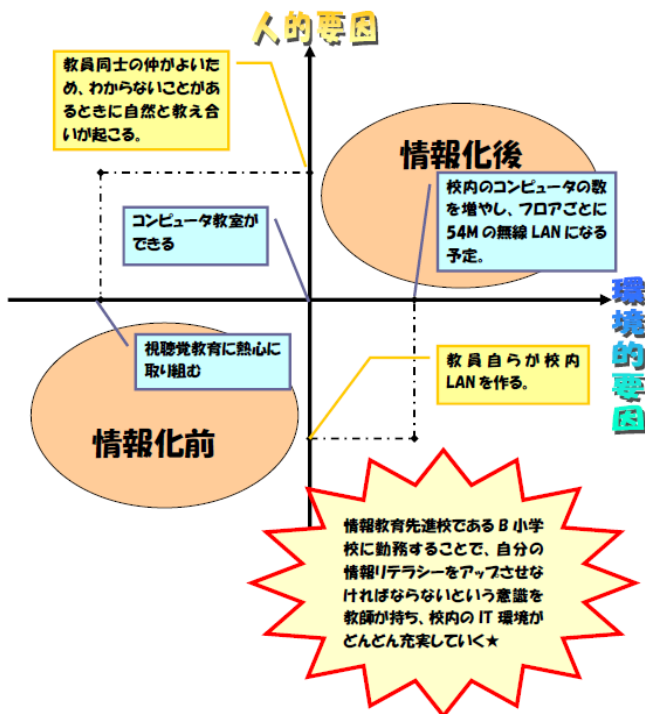


Figure 3. Description of two axis method illustration (matrix chart)

B小学校の情報化の方略

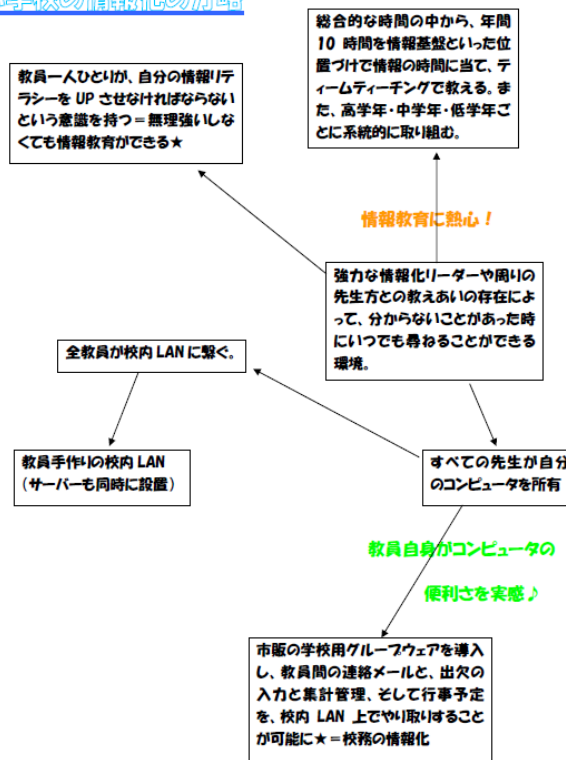


Figure 4. Pattern diagrams about "Strategy to the Information school"

3.2 Evaluation

The questionnaire survey was executed as an evaluation of the learning program after the learning activity. The questionnaire survey consists of the question of 22 in all. 11 questions are the selection forms by 4-point-Likert-type Scale ranging from 1 (*not at all*) to 4 (*very much*). Moreover, 11 questions are the free description forms.

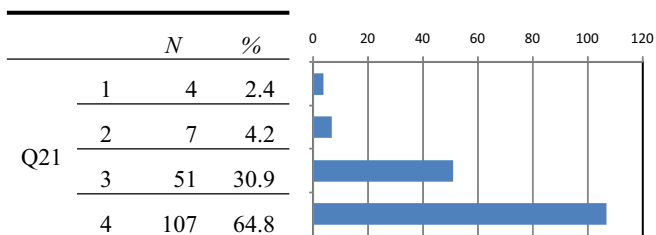
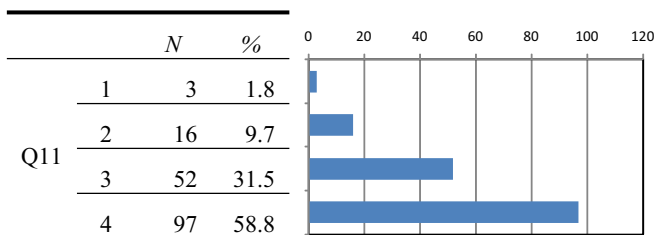
The number of valid responses was 170 of 178 attending a lecture. Table 1 shows a partial result. It chooses three items from 22 all items.

Table1. Question and Result

[Q11] The teacher directed the procedure for making your works in some steps. Help from the teacher was effective for you to work smoothly and to obtain a final product.

[Q19] You analyzed the relation of the factor by "Two axis method". And, you summarized the result in figure. These activities were useful for the deeper understanding of the case with informationization for the school education. Moreover, it was useful for obtaining new awareness.

[Q21] "Strategies for informationization of the school" that you had planned was opened to the public between those who attended a lecture. And, you were made to learn other people's ideas mutually. These consideration deepened your understanding.



Q11 is a question of the activity process. There were 58.8% participant who had come by help that obtained the work as a result. This shows the effect of dividing the problem into the sub-target.

Q19 is a question of the activity looked into oneself. There were 41.8% participant who assumed that it had obtained new awareness. It is shown that the effect reached the individual understanding of the object by analyzing "Two axis method" that uses the illustration.

Q21 is a question of the cooperating activity in the group. There were 64.8% participant who assumed that it was able to deepen own idea by knowing others' ideas. It shows the effect of the deepen of the self-understanding by others' referring to the view and the idea. That is, it is an effect of the thought own posture that can objectively catch oneself, and look into oneself.

4. Conclusion

In this paper, we proposed that the frame of the project study as a method of achieving training that built in the problem solution by the cooperative work, and to describe the project study by "Activity guide" that was a kind of work flow. The training program of the practicality was executed. As a result of the evaluation, it was suggested that the feature of PBL, that is the activity process, activity looked into oneself and cooperative activity, have effectively acted on those who attended a lecture by "Activity guide" proposed by this study.

As the future work, it is enumerated to arrange the constituting principle of the project base study again based on the finding obtained through the operation of an actual system.

References

[1] Toshio Okamoto, "Advanced Information Society; synthetic research on the contents, system and form of teachers' education - final report", *3 year research grant of the Ministry of Education, (A)(1)09308004 stage report*, 2000.