

The Development and Application of Learning Support Service System for Normal Students' Work placement

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ABSTRACT: *The model of normal students work placement has been a significant measure for the reform of teacher's education and with the development of distant education theory; thus the education model of networked learning activities arouses major concern. On the basis of new horizons of learning support service in this paper, it will start from three aspects which are the model of learning support service, the design of learning support service system and the application of learning support service accomplished in Work placement to provide an new and effective interactive model to normal students' work placement activities.*

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1. Introduction

Case-Based Reasoning (CBR) is a reasoning technology in the area of Artificial Intelligence. Its aim is to use the past experience to solve new problems. CBR technology has been confirmed in the area of enterprises, medical, and biology. Now, we integrate CBR technology into the online study-support service system, and do research on the service of answering online questions automatically and intellectually that provided by online study system, take characteristics of learners and study styles into considerations, so as to meet the need of the individual learner and improve the quality of online study-support service system.

Through the practice in recent years, the activity of normal

student Work placement has extended the normal practical function at a certain extent, improved work-placement normal students' adaptation abilities of society and work-replacement normal students comprehensive quality, meanwhile, it has facilitated the basic education development of our countryside and achieved multiply tasks in terms of training qualified teachers team for normal university and developing basic educational teachers team. However, during the Work placement activities, the communications between teachers and students, students and students, students and schools, students and employing units have great retardance and hysteresis as a result of large space distance, long period of time, different learning abilities and particularly lacking of information exchanges in work-placement normal students' networked learning. Meyrowitz Joshua argued that the decision of people's interactivity is made by the form of information communication rather than the aspect of natural environment.[1] Actually, the form of information communication is a communication situation which includes not only the information contacted with social environment directly but also the circulating information not being contacted with those who are excluded by this social situation. [2] Therefore, to increase information interactivity is an effect means to solve the problems of information communication in Work placement activities, and it is also an important method to enhance the efficiency of Work placement activities.

Learning support service is an organized form that learners can make full use of institutional education service facilities. Thorpe (2001) deemed that whenever it happened such as before learning, during learning or after learning, learning support service was a reaction total of all elements for the requirements of known learners or learning teams. Ding Xingfu, a Chinese scholar, regarded that students' learning support service is a total of support service including all kinds information, resources and staff that based on bilateral communication of technological media, surely, students learning support service is composed of distant teaching colleges and their representative teachers

that provide distant students with an interpersonal face to face teaching means of teachers and students or students and students. The aim of students learning support service is to guide, help and encourage students' individual study as well as to promote the quality and effect of learning process. [3] We totally agree with scholar Ding's outlook towards the definition of students learning support service in this paper.

Consequently, if we put learning support service of distant education into the practice of normal students' Work placement in normal universities, it will contribute to the model of normal students Work placement and also is a beneficial approach to arrive at a upstanding result for Work placement. In addition, it has significant meaning for increasingly improving teachers' quality and accelerating the developing speed of teaching major. Certainly, impeccable education internship model make sure education internship obtaining a favorable result. Work placement is a course with many links and elements, thus, the layout of every link may affect the function and result in the arrangement of whole process.

2. Learning support service in the model analysis of normal students' work placement

The application of learning support service in the normal students' Work placement ought to consider "five S": learners, supporters, contents of learning support, strategies of learning support and environments of learning support. That is to say, who should be supported; who support; what does it support; how does it support and how does it manage support activities.

The normal students taking part in Work placement are those who should be supported. Normal universities, their relevant teachers and intern schools, their relevant teachers are supporters. Through face to face teaching, group discussion, networked learning platform, email and chat online system, supporters offer the supports from information, resources, staff and facilities. Moreover, supporters will organize a normal students' Work placement model (as the figure one shows) based on learning support service to make sure the supporter's activities implemented successfully and establish a reasonably effective administration and evaluation system for supervising and estimating support activities so as to ensure the availabilities of Work placement. [4].

3. Analysis on the design of learning support service

3.1 The design of learning support service in Work placement

The learning support service of normal students' Work placement includes four parts which are choosing a post part, learning part, exchange part and evaluation part, and each of them contains some sub-parts.

As the figure two shows, the major parts of learning support service system include the resources (learning materials, library and teachers or advisors) which normal students

can obtain during internship and the relevant media resources (tools and technologies) etc. Every element is not isolated but operated by learning support service system in order to integrally realize the support and service of work-placement interns. Internship advisors are the critical point to make learning come true and to provide interns with all-sided support through teachers' arrangements and bilateral communications between teachers and students. In this process, it includes lots of support schemes and corresponding support strategies to give interns timely feedback and support. the interns in this support environments can attain group communication, team work and form a learning community. The learning support system is so dynamic that it makes the different time period learners in any one of elements that are open and transparent subordinate systems in the whole learning system, and it also belongs to the visiting and interactive learning system. [5]

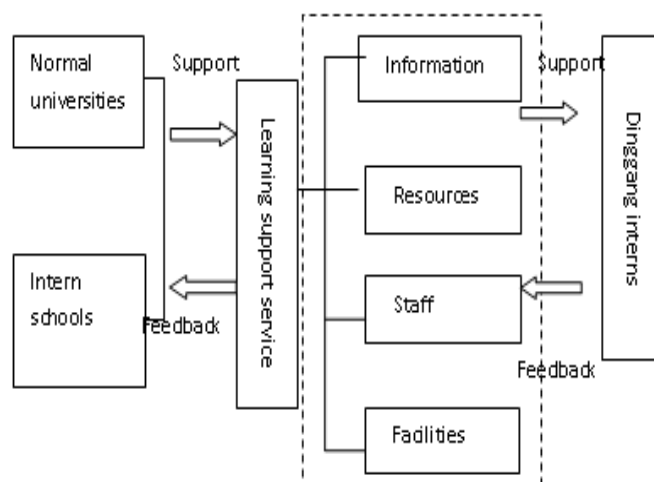


Figure 1. "Five S" Model Table of Learning Support Service in Work Placement

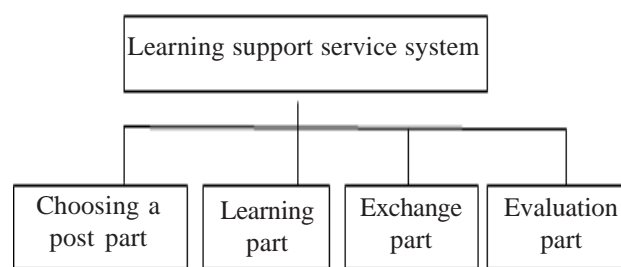


Figure 2. Learning support service system of Work placement

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3.2 Analysis on systematic parts

3.2.1 Choosing a post part

In this part, intern schools provide post information and platform for interns choosing a post so that both schools and interns have a bilateral choosing chance. Intern schools can fill in post introduction and interns' incumbent requirements etc in the column of intern schools register; interns can fill in personal information and intention of Work placement etc in the column of interns register. Normal universities collect and sort intern schools post information, then publish related information. According to the information published by normal universities, each intern can only fill in one post; afterwards, intern schools censor the applicants and issue employing information to the qualified interns.

3.2.2 Learning part

Only when interns log in and input their personal account, can they gain support of many kinds of resources including networked lessons, exemplary lesson videos, teaching plans base and networked library by learning part. Networked lesson is an online teaching platform for normal universities teachers giving lessons to interns and it replaces the traditional classroom lessons and meets the needs of separation between interns and teachers during Work placement. Exemplary lesson videos part supplies abundant excellent classroom lesson cases which can be learnt online or downloaded by interns. Teaching plans base part collects many preeminent teaching plans which embrace all subjects of elementary and secondary school so as to provide interns of Work placement with examples of lesson plans that can be downloaded. Networked library combined with normal universities digital library focuses on providing prosperous locating and downloading of Chinese and western countries' digital journals and references. [6]

3.2.3 Exchange part

Exchange part is an interactive platform for normal universities teachers, interns and intern schools advisors. This platform is utilized for realizing experiences exchange, private understanding sharing and answering puzzles with help of intern podcasting blog, intern forum and intern blog. Each of the four sub-parts has its own specialties. Intern podcasting blog can completely record interns' class lessons in a very direct way, because teachers or other interns may give some useful comments that usually can reflect interns' organized ability of lesson knowledge and

skills of teaching via watching class lesson videos. Intern forum is suitable to exchange experiences. It is often initiated by a intern or a teacher who comes up with a topic, then others express their views and experiences by replying placard person. Intern blog is more appropriate for sharing interns' personal understanding and emotion about internship such as writing internship diaries.

3.2.4 Evaluation part

Evaluation part majors in giving interns' Work placement achievement a scientific, rational, fair and justified appraisal and its function contains offering downloading of evaluation table, inputting evaluated information and achievement feedback.

4. The operating environment of learning support service system

4.1 Hardware configured environment

According to the major functions of this system, we need assemble an application server and data base server in the intranet in order to serve for each intern schools; certainly, it also can manage C/S clients for each intern schools.

4.2 Software developing environment

(1) The environment of application server and client side development: under the adoption of Window platform, the system will further develop JAVA and utilize the container of Eclipse 6.5 and WEB to make correspondence connected by using non-connection-oriented UPD protocol between Tomcat or JBOSS client side and application program. Data base server and document storage server employs Red Flag Linux; furthermore, WEB application server uses WINDOWS2003 and client side applies dominating operating system such as WINDOWSXP/2000 etc

(2) The development and formation of B/S structure: B/S frame employs developing tool--Struts spring hibernate to further develop and the developing model is MVC structure which means Model, View and Controller. The function of MVC is to put Web system into different duties. The Model level can approach service logic of system; View level can interact with users; Controller level is a bridge of Model level and View level; it can not only assign users' requirements and choose proper viewgraph to show but also explain users' input and reflect it as an executable operation in Model level. [7]

(3) Data base: in order to promote conventional character and convenient removal, C/S mainly adopts Sqlserver 2000 data base, because it can make use of different data base according to concrete environment. B/S utilizes Hibernate to access data base, allocates different data base drive according to different data base and achieves data base independence.

5. Realizations of learning support service in the normal students' Work placement

Systematic Administrators	Administrators	teachers	interns
Permission of resource administration	<ul style="list-style-type: none"> • upload resources • download video and play 	<ul style="list-style-type: none"> • upload resources • download video and play 	<ul style="list-style-type: none"> • upload resources • download video and play
Permission of units administration	<ul style="list-style-type: none"> • administration of intern schools 	<ul style="list-style-type: none"> • administration of intern schools 	<ul style="list-style-type: none"> • administration of intern schools
Permission of staff administration	<ul style="list-style-type: none"> • administration of staff documents 	<ul style="list-style-type: none"> • administration of staff documents 	<ul style="list-style-type: none"> • administration of staff documents
Permission of systematic setup	<ul style="list-style-type: none"> • administration of roles permission 	<ul style="list-style-type: none"> • administration of roles permission 	<ul style="list-style-type: none"> • administration of roles permission
Administrate all data		Administrate present data of intern schools	Administrate personal data

Table 1. Correlation table about roles permission of learning support service in the normal students' Work placement

5.1 Realization of role and permission distribution

During the development of each functional model in the learning support service of Work placement, at first, systematic administrator gives out private account to the relevant teachers and interns. The account names generally are faculty number and student number; basically, initial codes are the same with account name. Secondly, the systematic administrator uniformly distributes account names to the advisor teachers of intern schools. After logging in system, user can perfect personal information and change the code and also can possess corresponding permissions such as choosing a post, exchanging ideas, sharing resources and make your comments etc. permission and role aims to control systematic administrators, teachers and interns' permission, and it will be accomplished by systematic administrators inputting data. Clicking management of role and permission and adding new roles, you can check the list of all roles after finishing adding a new role; meanwhile, you can click amendment to renew the role's permission information.

5.2 Realizations in the functions of internship podcast

Normal universities teachers are unable to attend every lesson due to spacious limitation; therefore, they can evaluate interns' lesson performance via watching teaching videos.

Further more, networked videos shared can benefit for distant normal universities teachers watching and checking interns' teaching status, and they also can invite some intern advisors to take part in discussion about the interns' teaching videos which have already uploaded in the podcast. At last, teachers give their related information to feed back interns. Interns check evaluated information and book or refer to other interns' teaching videos through administrating their own podcasts. Certainly, after watching other interns' teaching videos, interns can evaluate them and help each other to improve together finally. During the

evaluation and introspection, interns make their teaching skills better on the basis of intern advisors and peers' suggestions. With the aid of evaluated means of teaching videos, evaluated roles are enriched; evaluate aspects become more comprehensive and reactions of internship status turn into more objective and scientific. In the meantime, all of resources can be kept as excellent teaching cases in order that following interns refer to.

Sharing of podcast consists of two parts: making, uploading podcast and booking, listening to podcast (As figure three shows). Interns record whole teaching process with the help of ordinary audio and video recording equipment and upload teaching video into personal center of podcast so as to produce a RSS which can release these teaching videos. Other interns or intern advisors can employ RSS to book their own relevant teaching podcasting programs for watching and making comments. [8]

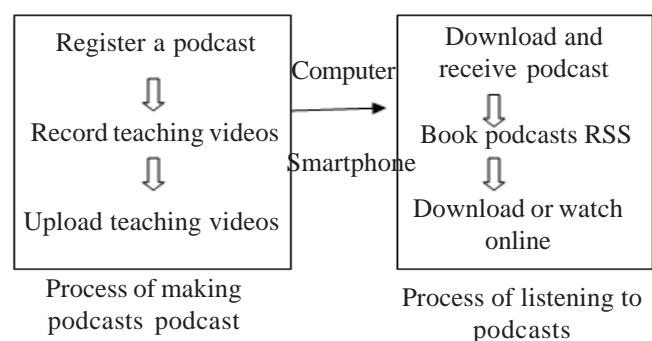


Figure 3. Internship podcasting table

5.3 Realization in the functions of teaching internship

The part of teaching internship is a platform of online learning and resources sharing and it includes four subparts which are administration of video cases, networked library, resources consulting and networked courses. By means of teaching internship part, interns

can log in networked courses to finish leaning of related courses, search for resources from networked library, upload teaching videos and cases, and share other interns teaching videos and cases by in-station consulting. Learning part resources are primarily collected by interns and intern advisors, which means that it takes intern advisors and interns' teaching videos and cases as main source and regards networked courses and networked library as supplements.

5.4 Realization in the evaluation functions

Evaluation of normal students' work placement is an important process, because it owns an effective path to exam theory learning, evaluate internship effect, urge internship work and feed back talents information.

(1) Design of evaluation index system

Evaluation index system becomes various owing to teachers and students' different views, and there are some references of various evaluation index systems. Educational internship evaluation index system embodies three kinds of indexes which are three first grade indexes, nine second grade indexes and eighteen third grade indexes. In the table two, the number of each first grade index means the percent of this index in all of first grade indexes, so do the second grade index and the third grade index.

(2) Application of vague comprehensive evaluation in the normal students' work placement achievement

The following example is an evaluation of some intern from an intern advisor of some internship school

The evaluation on intern's single factor $u_{21} = (u_{211}, u_{212}, u_{213})$ of above example can be got, then, intern advisor of internship school gives the student an evaluation from comments set and the results work out that u_{211} is excellent; u_{212} is good and u_{213} is good too. Consequently, u_{21} contains vague set of each single factor like $R_{211} = (1, 0, 0, 0)$, $R_{212} = (0, 1, 0, 0)$, $R_{213} = (0, 1, 0, 0)$. Combining with above vague evaluation, we can arrive at a fuzzy matrix. We can reach a correspondent weigh vector $A_{21} = (0.30, 0.30, 0.40)$ which is intern advisor's evaluation to the intern at the single factor u_{21} and also is a membership vector $B_{21} = A_{21} \bullet R_{21} = (0.30, 0.70, 0, 0)$ of comments set V from u_{21} . Similarly, we can obtain $B_{22} = (0.6, 0.4, 0, 0)$ and $B_{23} = (0, 1, 0, 0)$ which consist of fuzzy matrix ; because $A_2 = (0.2, 0.5, 0.30)$, we can have membership vector $B_2 = A_2 \bullet R_2 = (0.36, 0.64, 0, 0)$ of comments set V from u_2 .

In this way, we can gain membership vectors of comments set which are $B_1 = (0.4525, 0.5475, 0, 0)$, $B_3 = (0.6, 0.4, 0, 0)$,

First grade indexes	Second grade indexes	Third grade indexes	evaluations
U1 0.30	U11 0.20	U111 0.50	excellent
		U112 0.50	good
	U12 0.30	U121 0.50	good
		U122 0.50	excellent
	U13 0.50	U131 0.50	good
		U132 0.50	good
U2 0.30	U21 0.50	U211 0.30	excellent
		U212 0.30	good
		U213 0.40	good
	U22 0.50	U221 0.35	good
		U222 0.20	excellent
		U223 0.45	good
U3 0.40	U31 0.20	U311 0.50	excellent
		U312 0.50	good
	U32 0.40	U321 1.00	excellent
	U33 0.20	U331 1.00	excellent
	U34 0.30	U341 0.50	good
		U342 0.50	good

Table 2. Evaluation table of index system

$B_4 = (0.7 \ 0.3 \ 0 \ 0)$, $B_5 = (0.4 \ 0.6 \ 0 \ 0)$ from another four first grade indexes U_1 , U_2 , U_3 , U_4 and U_5 . These five membership vectors consist of fuzzy matrix $R = (B_1 \ B_2 \ B_3 \ B_4 \ B_5)$, T and counting R with the way of blurring operation, $A = (0.30, 0.30, 0.15, 0.10, 0.15)$, we can get membership vector $B = AR = (0.46375 \ 0.53625 \ 0 \ 0)$ of comments set from the first grade index. Finally, intern advisor of internship school gives the intern a last achievement evaluation which is $M = B \cdot X^T$; among the formula, $X = (90, 75, 60, 45)$ and $M = 81.95625$ which means the intern's final achievement is good.

By the same way, we can have a evaluation which comes from intern advisor of internship school, intern of internship school and intern himself/ herself. Bonding with various weighs from different roles, we can ultimately obtain the intern's overall evaluation.

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