Design of Video/Audio Education System for Small and Medium Enterprises

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Abstract. In the process of SME（Small and Medium Enterprises） Informationization, E-learning, which has many merits, such as low-cost and conveniences, is widely used in SME staff training .On the other hand, it has many shortcomings that are the contents and methods are not applicable. In this paper, we design a Stream-media-based Video/Audio Education System for Medium and Small Sized Enterprises after analyzing the needs of SME staff training and discuss the merits of Video/Audio Education,the model of this system ,the structure of this system and the key technologies.

Introduction

In the process of SME Informationization, Enterprises E-learning has many merits; the network courses based on html,text and power point show some limitations in the process of Skill learning. The Video courses will show the teaching scene in the traditional training to learners in a vivid teaching method, the learner will do the self-learning by Video course. The stream media has been a very important technology in the field of Video/Audio network. It provides a high quality transmission for the Video course and reappear the teaching scene. Using the video course and stream media in the SME staff training will break through the limitations of traditional text courses. Designing the personal learning space in the way of personal customized learning will enhance the enthusiasm of the staff and improve the efficiency of the training.

The usage of the stream-media based Video /Audio education system in the enterprises training

Enterprises E-learning has developed into the stage of network course which is characterized by stream media. The video course provides a real classroom situation,in favor of showing the tacit knowledge, providing the multiple characterizations. Having the advantages of concreteness and on-the-spot record, it can record the teaching process completely and give the learner immersive scene.

Stream media is the core technology in the transportation of the A/V. After compressing the A/V, Stream media technology put them on the server, instead of downing the whole compressed file to the home computer; it can down the file and enjoy the file at the same time. The merit of the stream media is saving time, improving the resource utilization and supporting a large number of users to concurrent access.

After researching the application of stream media in the SME Staff Training, we find that there are many shortcomings. First, system is not suited to training. Lacking high-quality and interactive video course, the content is not suitable for the training. It leads to non-application. Second, system lacks personal customized learning. In Video/Audio education system, most of the video courses are designed for the groups; the staff cannot realize the personal learning. Third, system lacks the

performance appraisal. Most systems just pay attention to the training, but not to the performance appraisal. [1]

Design the model for the Stream-media-based Video/Audio education system medium and small sized enterprises E-learning

We begin from the analysis of the needs of the staff and the process in the training. Abstract the teaching elements form the system in the teaching method of top-down. On the basis of the structure of the system and the key technology of stream media, we are mapping the sub-service of the teaching field to the video teaching mode in computer science. At last, we integrate all of the teaching elements and design the model, realize the application in the staff training (Fig 1). [2][3]

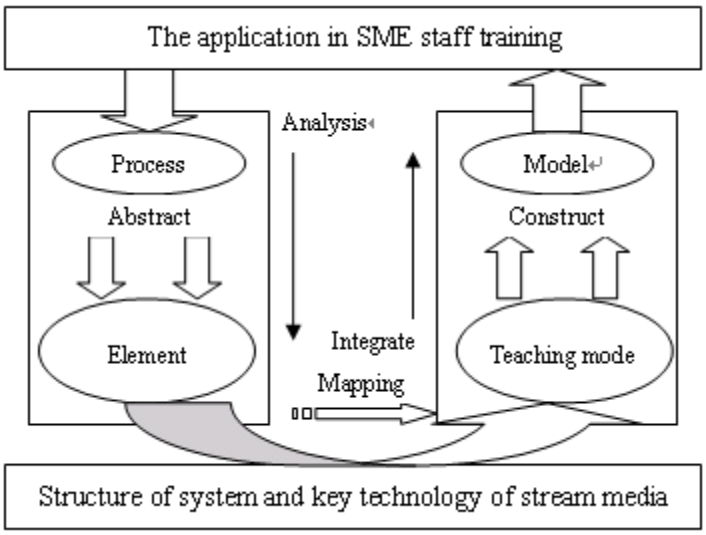

Fig. 1. Systems thinking model

Theoretical basis for model

System-based training model: Originated in teaching and training US Army has been used widely in abroad. It's prototype of the Systematic Approach to Training.

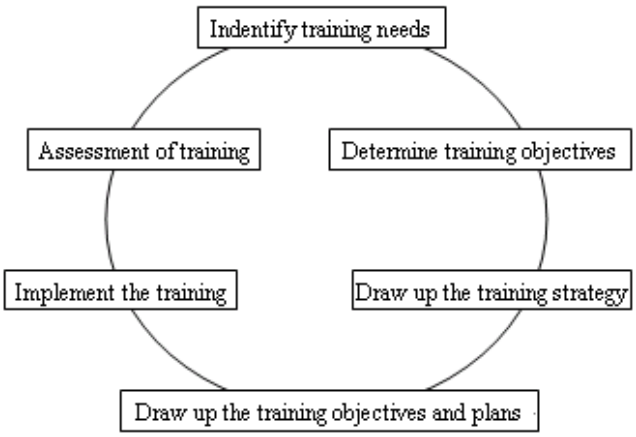

Fig. 2. System-based training model

System model is the logical steps. Contains :(1) draw up the training strategy (2) Identify training needs (3)draw up the training objectives and plans (4)implement the training program(5)Assessment and Auditing

Boydell (British) modified the training mode. He designed a cycle process. The following diagram (Fig 2):

The following is a cycle mode. Adding the evaluation of the training and identifying training needs. The whole process is continuous. The following diagram (Fig 3):

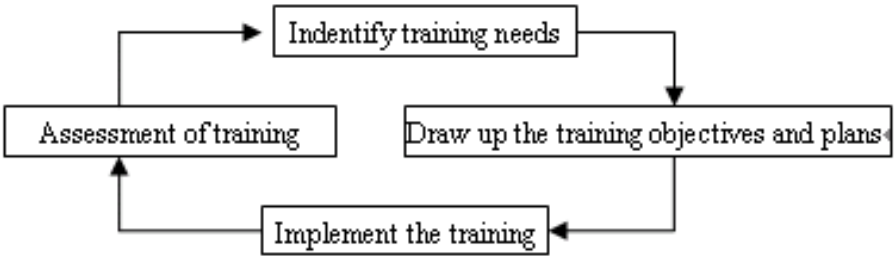

Fig. 3. Ring-type training system model

Model construction

Based on the System-based training model and analysis of environment for SME organization, we design the model for the Stream-media-based Video/Audio education system medium and small sized enterprises E-learning (Fig 4). This model contains two parts, the inside part is the System-based training model for SME staff training , containing identifying training needs, planning and designing the training, implementing the training, Assessment and Auditing .The outside part is training activities of the Stream-media-based Video/Audio education system, containing drawing up the learning objectives , analyzing the staff in the training, designing the teaching content, organizing the teaching content, teaching strategy, designing the teaching scene, assessment and performance appraisal. The model constructs the personal learning space for the staff and collaborative learning space for SME. [4]

Drawing up the learning objectives.

SME staff training is part of adult education. Compared with the common adult education,the former focuses on the time efficiency and requires the staff transfer the knowledge and skills to the actual work environment. It's not part of the traditional classroom teaching but the distance education network. It has a unique corporate identity. We can draw up the training objectives based on the ability and quality model; it provides a basis for the design and implementation of the training course.

Analyzing the staff in the training.

After the analysis of the adult learning theory and the learning styles of SME staff, the knowledge structure and the staff's ability of analyzing and solving problems have greatly improved. Motivation of learning is from internal and external pressure. They need the learning experience in the past to be recognized and applied in the process of training. The aim of learning is to solve the problem in the work and satisfy the need of work, the effect of learning is from the understanding and analysis of the problem. All of these are not separated from the experience, environment and the knowledge which has been learned. [6]

Designing the teaching content.

The content of training must be suitable for the SME staff. The SME staff training contains new staff training, job skills training, management training, tools training and others. The content of training must focus on the needs of the staff. The method of teaching must be consistent with the characteristics of the adult learning. It provides a real scene for staff. Besides, the staff's informal learning should be fully taken into account.

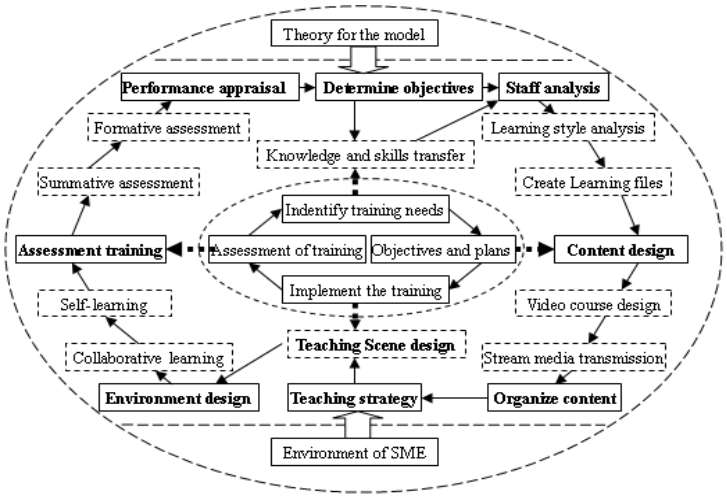

Fig. 4. Model for the system

Organizing the teaching content.

Stream media based Video/Audio course is the mainly manner of presenting the teaching content. The teaching content will be broken down into a number of knowledge points. All of the points compose the chapters of the course. In order to inspire the staff to participate in the training,we will add interaction into the design process and design a dynamic resource database,this database contains video course and relevant information.

Teaching strategy

Constructivist learning theory: Curriculum design and expression must meet the needs of different learners. The course must have the character of pertinence and should be updated on time. In order to stimulate the learning motivation of staffs and help them to transfer the knowledge and the skills which get from the training to the actual work, we integrate the lecture of the expert and demonstration of actual operation and create the teaching situation of resource, cases, questions and activities. We establish the index of video, retrieval and browsing system, provide a convenient access to learn the video. The electronic teaching plan and A/V must synchronous display. We use the Microsoft Producer to achieve this. [7]

Designing the teaching scene.

The design of self-learning environment: we can provide a personal learning space for the staff by the designing customized learning. It can reflect the different personality characteristics of the staff and provide the case of learning and help for them, design the space for displaying themselves and self-evaluation. The design of collaborative learning environment: we design a good supporting environment for the communication and collaboration between the staff and staff or the staff and the expert. Let these staffs in different places to complete the specific learning task.

Assessment.

Formative assessment: The manager carries out a detail record of learning by the computer procedure, getting the relevant data and information to adjust the teaching. In addition, carrying out the discussion, investigating and skills test. Summative assessment: After the teaching activities, we will evaluate the final effect. The summarize skills test mainly. In order to grasp the attitude of the staff about the teaching content and process, we will take the survey.

Performance appraisal.

We can find out the condition and problem of the training by the formative assessment and adjust the teaching activity on time. The condition can be added into the performance appraisal. All of these can help the enterprise create the healthy mechanism of promotion and form a good corporate culture. At last, we can judge the effect of the training by the summative assessment.

The design and achievement of the Stream-media-based Video/Audio Education System

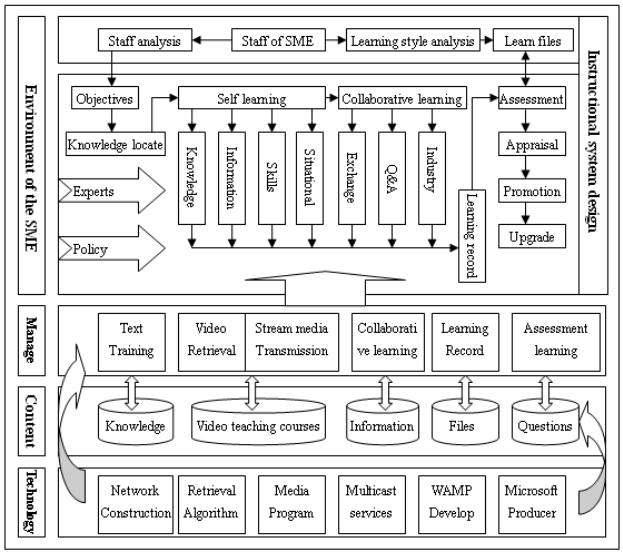

Fig. 5. Structure of the system

Structure of the system

Based on the model for the Stream-media-based Video/Audio education system SME E-learning, we design the system. In the microscopic level, the structure has four parts, technology, content, management and organizational environment (Fig 5).

There are eight functional modules, video learning, text learning, interaction, learning record, learning assessment and collaborative learning, staff files and information management.

The key technologies of the system

We use three key technologies in the system: content-based retrieval, Video and information Synchronous display and the continuity of the video's transmission.

To achieve of content-based retrieval.

Through the analysis of video content, unstructured video data will be structured. And extract the characteristic of an effective structure to describe the contents of cell. We establish the index of video, retrieval and browsing system, providing a convenient access to learn the video. We select the key-frame scene of the video teaching course in the method of "scenario-based video digest algorithm" and extract the key frame in the method of "based on the shot boundary", and then generate the video summary. The staff can find the course which they needs by the video summary. [8][9]

Video and information Synchronous display.

In the process of training, people often use the electronic teaching plan to aid training, and use the power point to design the electronic teaching plan. The electronic teaching plan and A/V must display synchronously, but it's very difficult. We use the Microsoft Producer to achieve this.

Continuity of video transmission.

We use the "buffer stored strategy" to ensure the continuity of the video transmission, stream media allows data pockets to reach destination through different paths, so that it may arise the phenomenon of first packet my be after. Due to the uncertainty of the network, it may result in the case of client disconnection. In order to ensure the continuity of transmission, the client must establish a buffer size. Chronological order will be sent and received packet stored to the buffer zone. It begins to play after the buffer was full. It takes only a few seconds to more than a matter of seconds to start playing after the client's request.The function of the buffer zone is: when the player emerged short period of

network congestion when playing which resulting that packet can't arrive on time, the player can play the pocket which stored in the buffer, avoiding interruption. [10][11]

Experiment

Experiment Ⅰ

We use windows media load simulator to test the sever ,the number of concurrent connections on a video course is 1000.

Experiment Ⅱ

From August 2016 until now, this system has been used for ten months in the network training platform for SME of Zhejiang province. More than 260 enterprises registered in the system. We investigated 200 registers in E-mail and received 167 feedbacks.

Table 1. Statistics the feedback

Service Items	Satisfied	Neutral	Dissatisfied
Quality of video course	63%	30%	7%
Effect of the training	75%	15%	10%
personalized learning	43%	24%	23%
collaborative learning	67%	26%	7%
performance appraisal	57%	40%	3%
corporate culture	81%	17%	2%

Conclusion

For the needs of the SME staff training, this paper designs the model for the Stream-media-based Video/Audio education system medium and small sized enterprises E-learning and Stream-media-based Video/Audio Education System for Medium and Small Sized Enterprises, analyze the key technology .We find that: when the advanced technology be used in the training, the mode of training must be suitable, the E-learning should play a key role in the process of the SME staff training. At the same time, we find the shortage: how to achieve the personal customized learning and group customized learning? Research in the future, we will focus on "customized learning in the Stream-media-based Video/Audio Education System".

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