An Evaluation System for the Online Training Programs

in Meteorology and Hydrology

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Abstract

This paper studies the current evaluation system for the online training program in meteorology and hydrology. CIPP model that includes context evaluation, input evaluation, process evaluation and product evaluation differs from Kirkpatrick model including reactions evaluation, learning evaluation, transfer evaluation and results evaluation in that the subject of evaluation is different. We take the advantages of the CIPP model and Kirkpatrick model in constructing an evaluation system for online training programs in meteorology and hydrology held by the WMO Regional Training Centre Nanjing, China so as to improve the effectiveness of the training programs and meet the demand of the national meteorological and hydrological services.

Keywords: Online Training, Evaluation System, Meteorology, Hydrology

1. The Current Status of the Evaluation of Online Training Programs

Internet plays a more and more important role on the platform of training programs, because of its low cost and trans-regional advantages. During the period from 2000 to 2008, more than half of the world top 500 companies have adopted online training programs. For example, British Telecom has its 90 percent online training programs; IBM has established a college to provide its employees throughout the world with online training programs. The research on evaluation system for online training programs is more systematic in developed countries than in developing countries. On the aspect of evaluation tools, it can generally be divided into two main categories: the first one is online data collection tools; and the other is to record, analyze the online-time, frequency of login, pages that browsed by the employees who participate in these training courses. On the aspect of the construction of platform, there are already some well-developed web education platforms, taking the "Benchmarking Service" for instance, which is a professional website evaluating the enterprises' training programs. On the aspect of evaluation for online training programs in China, it focuses on getting a certain kind of professional certificate after attending training course and passing the exam. On the aspect of constructing platform, some platforms have added evaluating function, but so far, the amount of the platforms which can sustain the systematic evaluation is still few. Most of the online training platforms mainly center on the level of online testing, following the process of the training course to analyze the changes in reaction and performance of trainees.

There are already experts investigating how to evaluate the result of training, and they came out with a lot of evaluation models. Among these models, there are some models which center on the result of training, such as "Kirkpatrick Evaluation Model", focusing on evaluating trainees' changes in reaction both in the training process and after training. There are other models centering on training itself, such as "CIPP Model". The paper aims at building the evaluation system for the online training programs. Only a systematic and integrated training schedule and procedure can guarantee the quality of training, so an efficient evaluation system should include a series of evaluation activities checking the training target, training itself and the result of training. Therefore, the paper takes the advantages of the "CIPP Model" and **"**Kirkpatrick Model" to construct a scientific and more effective evaluation system.

"CIPP Model" is an evaluation model consisting of context evaluation, input evaluation, process evaluation and product evaluation. Context evaluation means defining environment and requirement, and carrying out demand analysis, which can help set up the training objective. Input evaluation is evaluation of the information or data which can be utilized to achieve the aim of training by the most effective approach. "Kirkpatrick Model" includes reactions evaluation, learning evaluation, transfer evaluation, and results evaluation.

2. Constructing the Evaluation Index System for Online Training Programs

Employees of any profession need continuous study in work, so good training, such as online training program, can improve their comprehension towards new knowledge and technology, and eventually bring more rewards to the enterprise that they work for. The cost of online training is low, and the training program can reach more employees who want to share training resources. Therefore, to construct the evaluation system for the online training programs helps a lot to improve the quality of training.

Comparing with traditional face to face study, the characteristics of online training is the division of time and space. Online training is implemented via reliable and safely network, trainees' study is mainly autonomic learning which means that they carry out various kinds of learning activities on the platform supplied by web-based instruction independently. To ensure the process of study goes with a swing and finally the trainees achieve their goals. Meanwhile, we have to evaluate the level of guarantee of goal setting, supportive environment, resource development and utilization, the quality of teachers, the content and process of training, training environment and result, training objects and other items.

The evaluation of goal setting, supportive environment, resource development and utilization, the quality of teachers, the content and process of training, training environment and result, training objects belongs to training itself, so we adopt "CIPP Evaluation Model"; meanwhile, we adopt "Kirkpatrick Evaluation Model", which centers on the result of training, to evaluate training effectiveness.

2.1 Constructing the Evaluation Index System Which Centers on Training Subject

The preferential item shall be the evaluation of context, which can be recognized as demand analysis. Numerous training programs put their emphasis on meeting the training demand during the whole course. They made their decision of carrying out an online training program relying on analysis of policy basis, implementation need, technical conditions, organization conditions, skills of trainees; and their training conspectus on the basis of practical demand. To some extent, the interaction during training and the satisfaction of trainees may reflect the quality of training.

Following item is the evaluation of investment. Investment is a series of effort that training organization devotes in advance to achieve the target to make sure trainees get trained, such as supplying supportive environment, designing and constructing training resource, organizing teachers, setting out training curriculum, creating online training environment and so on.

2.1.1 The Evaluation of Supportive Environment

Supportive environment consists of layout plan, management system, financial support, technical support and facilities support. By the evaluation of background we can draw up a plan, and revise the plan according to reflection which comes out of the evaluation during training; the evaluation of management system is an indispensable link of the whole evaluation procedure, which is comprised of teaching management, assessment management, teacher management, resource construction management and so on. The evaluation of management system can undergo in the form of inspecting the conclusion documents or reports of the implementation conditions of every system, the evaluation of management system can promote the efficiency and stability of training in network environment. Online training is costly in early investment, resource construction and maintenance, so we have to make cost-benefit analysis, where the evaluation of financial support is essential. Expensive input may guarantee the quality of hardware and software of online training, but we shall pay enough attention to the balance of technical device input, make best use of resources and device. Technical support can be recognized as multi-media technology such as automatic Q & A system, auto homework system, and online study field, and intelligent platforms. Facilities support is mainly about constructing and optimizing hardware, making use of virtual laboratory, and constructing environment for practice.

2.1.2 The Evaluation of Designing and Constructing Training Resources

Evaluation of curriculum development is the core guarantee of the quality of the evaluation system. The quality of courses concerns a lot the success of the holistic training. The evaluation of curriculum development commences from design of curriculum, content of courses, direction, and demonstration of information. The design of curriculum shall adjust to the characteristics of self-study. As for self-study, study in coordination, practical activities, assessment and examination of different teaching activities, we should take full consideration, design the curriculum rationally, and widely popularize excellent courses. The evaluation of curriculum design consists of the evaluation of selection, adaption, or development of teaching material, academic environment design, instruction of trainees' learning, content, homework arrangement and some other aspects.

2.1.3 The Evaluation of Organizing and Arrangement of Instructors

Instructors for online training should reach a certain level on professional knowledge, teaching experience and pedagogical psychology, they also have strong responsibility and a teaching organizing capacity, to give trainees advice in study, conduct study content, promote and maintain communication among trainees, so as to cultivate trainees'

independence, enlighten trainees' imagination, and problem-solving capability. The evaluation of instructors' teaching quality could adopt different approaches, such as public hearing, evaluating lesson plan, teaching content, teaching style, teachers' performance and participants' attitude and so on.

2.1.4 The Evaluation of Training Courses

All kinds of courses are the vehicle of online training which consists of courseware, teaching activities and learning resources. The evaluation of training courses not only means to evaluate the results of implementation of courses, but also shall involve schedule, content, process of implementation and management of courses.

2.1.5 The Evaluation of Training Network Environment

The items that need evaluation include the interface's individuation flexibility and some other items, like whether the administrator is aware of that a modification to navigation or reposting the attribute of a certain functional link may change navigational charts or backgrounds, as well as stability, cultural atmosphere, system operability, real-time, flexibility, expandability and efficiency.

2.2 Constructing the Evaluation Index System Which Centers on Trainees

The evaluation of reactions usually carries out in a modest way to investigate trainees' satisfaction after training. Furthermore, reaction evaluation may commence from trainees' participation to evaluate trainees' reaction, which means that if trainees enjoy their study with high enthusiasm, the training turns out to be an excellent one high quality and has its attractive merits. Participation may be inspected from trainees' clicking rate, post and reply in forum, condition of homework submission, resource sharing and comment on each other's work.

Insert Table 1 Here

The evaluation of learning is to examine and assess trainees' learning effect, mastery of knowledge, so as to urge trainees to complete their self-learning to meet the quality demands of training. At the beginning of the training, we shall come out with a pre-test for each training module on the basis of training target and traits of curriculum. Before every training module begins, trainees are going to finish a corresponding pre-test; and after every training module, a post-test should be designed, by analyzing the changes between pre-test and post-test, we may figure out in what extent of trainees' understanding of knowledge and technology has been conveyed to them. In addition, a procedural evaluation platform is necessary in the process of training, which makes tracking and evaluating trainees' study and achievement possible. Index of learning evaluation: 1 The results of pre-training test and post-training test; 2 Participation of online learning; 3 The results of exercises and practice; 4 Assessment of final exams.

The evaluation of transfer reflects trainees' capability of applying what they learn into practice. The evaluation of transfer needs follow-up investigation on trainees' practical work after training. Considering the particularity of online training, evaluation may be built on the basis of the feedback given by trainees' colleagues and leaders and trainees' comments published on the forum of the website.

The evaluation of results mainly evaluates trainees' progress in performance after training. Because the emersion of progress in performance usually takes a period, we evaluate trainees' progress, and then design suitable post-test questionnaires.

3. Conclusion

Establishing an effective evaluation system of online training programs is significant to ensure the quality of training and keep improvement continuous; which is also necessary to form a mechanism of self-evaluation and supervision, and enhance management of quality control system. The evaluation should cover links such as, designing and constructing supportive environment and training resources, organizing instructors, setting training curriculum, creating training network environment and so on. Exploration in the field of the evaluation system is continuous to ensure the effectiveness of the online training programs in a systematical environment, in order to train more high quality meteorologists to meet the demand of meteorological and hydrological service.

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Table 1. Index system of evaluation

Index of evaluation	Topics of questionaires
1.Overall reaction to the training	Topic 1.Overall Reaction of the training course
2.Reaction to the online learning environment	Topic 2.Reaction to the online learning environment Online learning Platforms Speed of online operation Convenience of Operation of the platforms Online information resources Supportive environment
3.Reaction to the target of the online training program 4.Reaction to the online training content	Topic 3.Reaction to the target and content of the training program The consistency of Content and target Richness of content Diversity of training activities Interactions of online training Correlation of the training target and work The practicality of Training material
5.Participation of the online learning 6.Reflection on learning results	Topic 4.participation and gain Participation time of online learning per day Acceptance of online training Factors influencing online learning The most impressive part of the training program Learning results of training