Research on the Conceptual Framework and Key Issues of Equipment Digital Training

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Abstract: At present, Military Academy education, military training practice and military vocational education play an important role in promoting personnel training, on-the-job training and life-long education. As a new form of equipment training, equipment digital training is an important means to improve the efficiency of equipment personnel training and training effect. Based on the analysis of the development mode of equipment teaching and training, this paper constructs the conceptual framework of equipment digital training with three-dimensional structure, and points out the key problems affecting equipment digital training.

1. Introduction

With the development of information technology, equipment digital training as a new form of equipment training has gradually become an important means of equipment information training. In the new era, the Central Military Commission put forward the strategic deployment of "a new military personnel training system that should improve the military, college education, military training practice, and military vocational education"[1], emphasizing the strategic goal of large-scale training of high-quality new military talents. Relevant standards have also been formulated for the capacity of military personnel. In the increasingly integrated capacity requirements, equipment utilization ability is an important indicator for evaluating military equipment talents. In recent years, our military equipment construction has achieved leap-forward development, and the Informa ionization of weapons and equipment has become more and more high, showing the characteristics of complex system structure, intensive information technology, and cross-cutting of professional fields. This puts forward the ability and quality of the equipment and equipment personnel. Higher requirements.

2. Background of equipment digital training

Equipment training is an important means to equip personnel training and realize the combination of human and equipment. The new equipment training needs and modern information technology combine to promote the emergence of new models of equipment digital training, making it one of the important forms of equipment information training. Equipment digital training is the basic link of equipment training. It supports the trained personnel to enter the digital equipment training space before contacting the simulated equipment and installation, and realize the knowledge and interaction training of the equipment structure principle, logic operation and operation steps. In order to lay a good foundation for the subsequent simulation training and installation training, and improve the equipment training cost-effective ratio. It is an important means for the formation of military equipment combat capability and support capability, and will certainly play an important role in the cultivation of military equipment talents.

In the process of equipment training technology development, Computer-aided Instruction (CAI), as a mature information teaching method, has long been a widely used equipment teaching and training method in military academies, and has increased learning through illustrated multimedia forms. Interesting, to a certain extent, improved the training effect, but the motivation for autonomous training is slightly insufficient, the degree of visualization is not high; Computer-Based Training (CBT) uses graphics, audio, video, 3D and Multimedia devices such as Virtual Reality (VR) have created a vivid and vivid single-machine training environment for the trainees, as well as a realistic interactive experience, so that trainees have an immersive experience in the training process[2]. Web-based Training (WBT) is an online training conducted by a network platform using a network and a browser. It belongs to the category of equipment network training; the emergence of E-Learning provides a ubiquitous the training environment can meet the individualized training needs and reflect the autonomy. Compared with CBT, E-Learning has penetrated into various fields of teaching and training, breaking the limitations of traditional time and space and realizing distributed learning in the network environment.

The digital training of equipment fully draws on the new ideas and new technologies of modern teaching, integrates content, management, service and technology. Its core idea builds digital equipment training space, provides digital equipment training resources and digital training platform, and supports equipment theory training and skills. Training to achieve full management and comprehensive assessment of trainees. Equipment digital training is the theoretical teaching and skill coaching activities carried out by the military in order to improve equipment development, security and management effects, using digital training resources in the digital training space [3][4].

3. Equipment digital training concept framework

3.1 Conceptual framework

Equipment digital training is an important equipment training link to train new equipment talents and enable the troops to quickly generate combat capability and support capability. From the perspective of system theory, equipment digital training is a complex system with hierarchical and diversity. To realize the construction of digital training service environment in equipment training field, it is necessary to have a clearer understanding of equipment digital training. The conceptual model is a conceptual abstraction and description of the real world and its activities, playing a bridge between the real world and the actual running training system [5].

The conceptual model of equipment digital training is to limit the boundary of equipment digital training from the ontology. Hall three-dimensional structure is a reliable method to study complex systems [6], which can decompose equipment digital training according to dimensions. Jane provides a practical approach to building a conceptual model. Equipment digital training is a complex system engineering. How to effectively integrate the above-mentioned multi-layer content and systematic research is the basis for realizing digital training of equipment. Through the analysis of equipment digital training ontology, the key problem of equipment top-level design is lacking in equipment digital training. Based on Hall system structure thought and method of Hall three-dimensional structure, the three-dimensional structure concept of equipment digital training is established from field dimension, process dimension and technology dimension. The model is shown in Figure 1.

The field dimension embodies the equipment training system of equipment digital training trinity, which provides guarantee for the extensive development of equipment digital training; process dimension is the core of equipment digital training, which reflects the knowledge generation, transmission process and evaluation feedback mechanism; technology dimension is realized The key technologies needed in the process of equip digital training provide technical support for the realization of equipment digital training. The analysis of equipment digital training from the above three dimensions can make the system of equipment digital training more comprehensive and clearer, and help to understand the connotation and outer edge of equipment digital training.
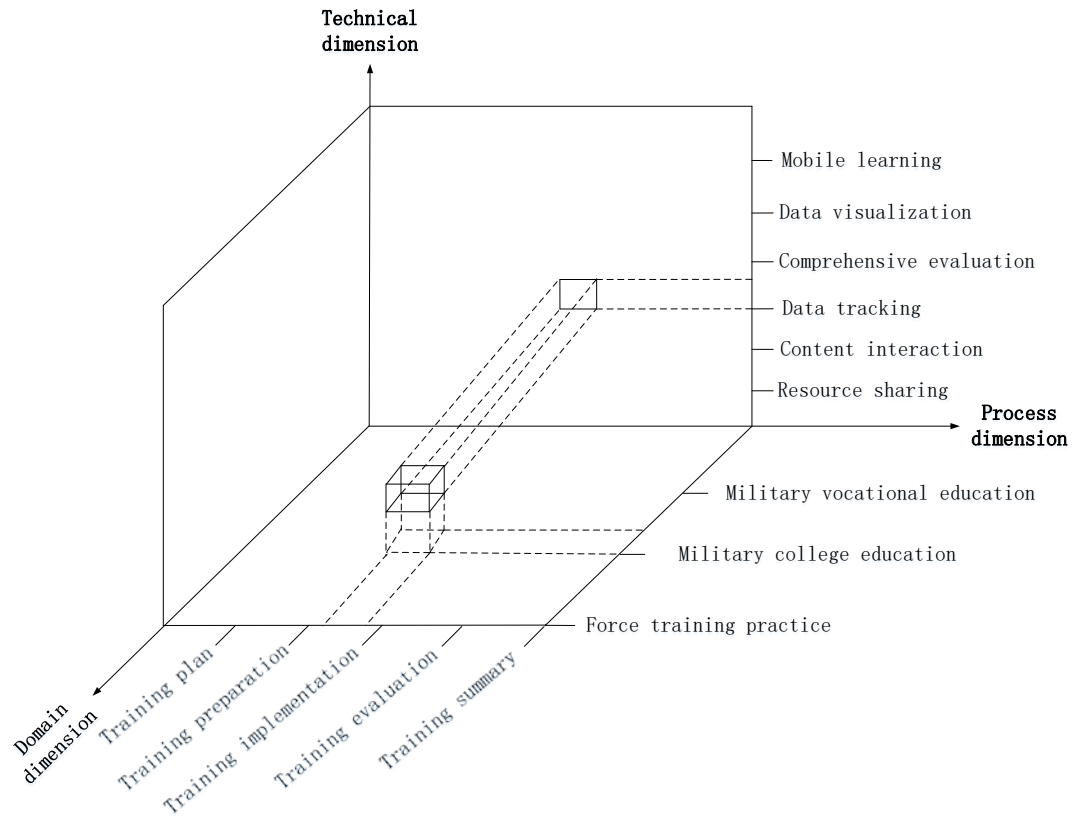
Figure 1. Conceptual model of equipment digital training three-dimensional structure.

3.2 Equipment digital training development model

As a new training method for training equipment talents in the equipment training field, the equipment digital training makes full use of advanced technologies such as digital technology, Internet technology, interactive 3D, virtual reality, etc., to support the ubiquitous access, independent learning, full tracking and visualization of trainees. Evaluation can quickly improve the training staff's equipment theory and operational skills, improve training efficiency and training results. At present, under the "trinity" military personnel training system, the preliminary pilot work of military vocational education has been started. The overall planning of the whole military simulation training center system has been demonstrated, and a large number of military remote online digital content is already under construction. This is the digitization of equipment. The comprehensive development of training provides a solid application background.

Equipment digital training is an important supplement to equipment network training and simulation training. Positioning focuses on the abstract cognition and virtual interaction training of equipment, technically need to solve resource digitization and sharing, ubiquitous learning platform, training space digitization, etc. The problem is to use a standardized network learning platform and resources for single-machine or distributed training to achieve limited management of the course management and training process.

Therefore, equipment digital training should be demand-centered, based on standards, make full use of current advanced information technology, promote modularization and modeling of training resources, remote and compatible training platform, autonomy and guidance of training methods. Sex, training process interaction and tracking, training evaluation mode data and visualization.

4. Key issues in equipment digital training

4.1 Sharing and utilization of digital training content

In the digital training space, the training resources are diverse in form, different in format and

different in standards, which is not conducive to the sharing and utilization of training resources.

To realize the sharing and utilization of training resources, it is necessary to modularize the content objects and model the training courses.The development standard of IETM supports the modular development of equipment technical data. By developing the equipment technical data into individual data modules according to the type, the training course can conveniently select the appropriate resources. The modeling of the training course is to organize and aggregate the content objects according to a certain structure, and realize the structure of the training course. At present, the SCORM standard is the most widely used international standard for training content development. It has the characteristics of reusability, accessibility, interoperability and durability. It can solve resource sharing and interoperability is not perfect, network is lost, and cannot provide Personalized services and incompatibility between training systems will increase the versatility and sharing of training courses and content, thereby reducing development costs [7].

4.2 Recording and tracking of digital training process

With the development of big data analysis, prediction and visualization technology, the importance of training data has become increasingly prominent, and the demand for training process data has been increasing. The training data can reflect the behavior and ability of the trainees in the training process. It has important guiding significance for the trainees to adjust the training strategy, regulate the training progress and adjust the training state [8]. Most of the current training systems only provide a training environment, and the performance of the trainees in the training process is not enough. Although the SCORM-based training system realizes the management of the training process, it can track and record the training through the communication between the SCO and the system. Training process data, but due to the locking nature of the training system, the training data can only be used internally, and only some data is applied, such as the completion of the training content, training time, grades, etc., a large amount of training data is locked in the system. In a proprietary database.

To unlock these data, a new data tracking mechanism needs to be established. xAPI is a new generation of E-Learning learning technology specification, which makes up for the shortcomings of SCORM standard in data tracking, and provides solutions for data recording and tracking in the process of digital training. A viable option.

4.3 Evaluation and feedback of digital training effects

The training effect evaluation is an overall evaluation of the trainee's training situation and a key factor in the training evaluation. The traditional evaluation of the trainees only reflects the training results based on the training results. The lack of attention to the training status of the trainees and the training process makes it difficult to make a comprehensive evaluation of the trainees. Based on the SCORM standard training system, the trainee's training time, number of times and content completion degree are displayed in the form of visual charts, which reflects the training status of the trainees, but does not reflect the training. Training behavior during training.

A comprehensive evaluation based on the training state, training process and training results can accurately, objectively and comprehensively evaluate the training ability of the trainees. Through the visual feedback of the training data, the trainee's training behavior can be visually reflected and help the trainees adjust. Training strategies and improved training methods [9]. To evaluate the training effect of the trainees, it is necessary to implement the evaluation function module based on the training data, and the visualization of the training data can be integrated by integrating the LRS with data analysis function.

5. Conclusion

With the development of information technology, IETM and E-Learning have played an important role in the auxiliary training of equipment as an important form of CBT and WBT development. Equipment digital training is proposed to further improve the training

cost-effectiveness under the conditions of new equipment training and new technology development. Compared with other equipment training methods, equipment digital training focuses on the teaching and operation process of equipment theory knowledge. Experience, that is, networked equipment teaching, simulation equipment virtual reality training, and a ubiquitous training environment. The introduction of equipment digital training has updated the traditional equipment training concept, extended the equipment training time and space, eased the imbalance of training resource allocation, promoted the deep integration of information technology and training management, service, and can meet the individualized training of trainees. Training needs reflect the autonomy of training.

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