Foreseeing the Subversive Influence of Intelligent Simulation Technology for Battle Example Teaching

Nan Wang * and Miao Shen
Dept. of Warship Command, Dalian Naval Academy, Dalian, Liaoning, China

*Corresponding author e-mail: yaqinzhang@njmu.edu.cn

Abstract. It is an important research project that exploring battle example teaching is how to serve the fight and drill preferably. The simulation territory has introduced artificial intelligence, virtual reality and cloud computing at present, the simulation based on these techniques will bring far-reaching influence for battle example teaching. The intelligent simulation technology will remodel analysis factors of battle example, reconstitute research idea of battle example, overturn the research of battle example. The battle example teaching methods based on intelligence confrontation, scene recurrence and fight chess manoeuvre will show itself, and it will help researchers capture victory inspiration from battle example, feel command art in virtual confrontation and excavate defeating mechanism from retrospect research.

Keywords: Intelligent Simulation Technology, Battle Example Teaching, Application

1 Introduction
The past battle examples may not be the same as modern warfare in terms of equipment, but their operational concepts are still unfading, which still have important implications for modern warfare. The teaching of battle examples mainly uses words, images, illustrations and sand tables as the traditional research methods. The researchers have gathered their painstaking efforts and wisdom to summarize many classic battle examples at all times and in all countries. The summary in words has always played an important role in fight and drill. Researchers should also see that many kinds of intelligent simulation technologies are profoundly changing people's life and work, and also have a profound impact on the field of military research. Simulation itself is not only a process of knowledge processing, but also a process of analysis and research, modern simulation technology has not been widely used in battle example teaching (BET), as a general supporting technology, simulation technology can help solve some difficult problems in battle example teaching, and generate some key insights and innovative ideas, which can not be replaced by other methods. Case study (CS) should seize the opportunity of new technology and get high quality development, otherwise it is easy to be marginalized. Foreseeing the impact of intelligent simulation technology on case study will inject inexhaustible power into the follow-up case study.

2 Intelligent Simulation Technology will Reshape the Elements of Battle Example Teaching
Engels said, "As soon as technological progress can be used for military purposes and has been used for military purposes, they will immediately, almost forcibly against the will of the commander, cause changes or even alter the way of operations [1]. When it comes to the Persian Gulf War, people will think of Operation Desert Storm and Warden's Five Rings. When it comes to the Iraq war, people will think of Decapitation and Effect based combat theory. In the past, there was not a big difference in the interpretation and research perspectives of battle examples, the latecomers often just looked at the "back of the neck" of their predecessors and regarded the results of previous studies as the final conclusion, which was obviously not conducive to the development of battle example studies. Therefore, modern battle example teaching needs new perspectives and new technologies to explore new enlightenment. Battle example teaching should not only stand on the "shoulder" of the predecessors, but also should not stick to the "habitual interpretation". On the one hand, it should be "Great minds think alike", but on the other can not be trapped by the "conclusion".

2.1 AI Enabled Battle Example Teaching will Provide a Strong Opponent
Many researches in modern military field are based on artificial intelligence service platform [2]. Artificial intelligence algorithm which can exchange data with each other provides favorable conditions for battle example teaching. For example, "AlphaGo", the first one to beat human professional go players, is an important symbol of artificial intelligence in the new era. Its working principle is to conduct deep learning through multi-layer artificial neural networks. It is through deep learning that "AlphaGo" finally makes all industries realize the extraordinary ability of artificial intelligence. The cases of AI won in chess and games indicates that AI can be applied to research on battle example teaching. It is not important to realize how strong the artificial intelligence is, but important to combine the artificial intelligence with the research on battle example teaching closely and switch the theoretical analysis thinking to the artificial intelligence thinking. The application of artificial intelligence to battle example teaching will provide more updated analysis elements, expand a broader research space, and open up a high-level opponent scene to meet strong challenges in the recurring battlefield. By building intelligent opponents, we can analyze the essence and characteristics of battle examples more deeply, focus on the key problems to be solved, and criticize the past war experience, so as to establish new concepts, explore new ideas, and form new thinking.

2.2 The Integration of Virtual Reality with Battle Example Teaching will Provide an Unprecedented Historical Scene
Virtual reality technology is an important branch of modern simulation technology, which provides people with unprecedented visual shock. At present, most of the scenes made by virtual reality technology are based on the models of people, objects, environment and their interaction [3]. These simulation models reflect the essence of things and are presented to people through computer external equipment, which greatly reshapes the interaction between human and simulation scenes. The application of virtual reality technology to battle example teaching is to provide a virtual battlefield that can produce interactive functions and a construction environment that can study details. The advantage of virtual reality technology in displaying interactive battlefield scene is that it integrates computer graphics technology, sensing technology, three-dimensional display technology and other subject technologies. Through the integration of these technologies, it can project realistic historical battlefield scenes, so as to provide a research environment for researchers to immerse, interact and conceive. In this virtual interactive battlefield, the content and form of case teaching will be more abundant, the feeling of combat action at that time will be more direct, and the understanding of combat commander decision-making will be more profound.

2.3 Cloud Computing Supports Battle Example Teaching will Provide a Precise and Comprehensive Data Support
Different from the previous simulation technology, cloud computing emphasizes the network service of simulation technology. Users can find professional information technology solutions in network
services according to their needs. The data processing method of battle example teaching also needs to keep up with the pace of information development. The backward processing method will not only hinder the development of case study, but also have adverse effects on the application of case results in fight and drill. In the background of big data era, with the rapid development of data processing technology, cloud computing will profoundly affect the data analysis and processing mode in battle example teaching. At present, cloud platforms have sprung up in many industries, such as "Y-English" and "cloud medical treatment". Of course, "cloud" also has space for application in battle example teaching. Battle example researchers can run the battle examples written in the "cloud" or establish data analysis services based on "cloud". The cloud platform will integrate the previous case database construction, and concentrate the data of personnel, weapon equipment performance, action points, battlefield environment and other data in the cloud, so that researchers do not have to repeat data processing, just concentrate on using cloud data for in-depth research. Therefore, the battle example teaching supported by cloud computing has higher efficiency and greater application value, which will provide a precise and comprehensive data support for analysis.

3 The Intelligent Simulation Technology will Reconstruct the Battle Example Teaching

The development of simulation technology is changing with each passing day, but the battle example teaching has not entered the advanced stage of simulation system development and application. The more scientific the concept and the more reasonable the method is, the more valuable the case study will be. At present, the content of case study is mainly manifested in on-the-spot discussion, text analysis, etc., the research focus is not enough; in the form, it is mainly based on the planar single media, and the research is not attractive enough; in the experiment, it lacks of complete and effective technical support, and the actual benefits are not fully played. Therefore, the purpose of introducing intelligent simulation technology is to solve the problems of single perspective, lack of methods, insufficient dimensions and difficult to experience.

3.1 The Concept of Battle Example Teaching has Changed from "Cognitive Analysis" to "Precise Analysis"
"Cognitive analysis" refers to the understanding and mastery of the facts and processes of cases, including the basic facts and objective situations such as the causes, processes and conclusions of cases. However, the purpose of battle example teaching should not be limited to the cognition of case facts, but also to draw valuable enlightenment for current fight and drill. According to this, the case study also needs to make a detailed investigation of each link in the case, otherwise, the potential high value of the case can not be found out, and the conclusion is difficult to be convincing. Therefore, the concept of battle example teaching should be changed from "cognitive analysis" to "precise analysis". Through precise analysis, the internal and external causality of cases can be deeply analyzed, and the art of decision-making, operational law and command strategy of the case itself can be seen. This is just like observing cells with a microscope to observe their "cytoplasm" and "nucleus". Cases may contain many factors that are helpful to future wars. Only by means of “microscopic analysis” can we dig out the essence, so as to widen a new world. It is necessary to construct the international political, economic and diplomatic environment for precise analysis of cases by using modern simulation technology, and to analyze various factors such as forces, combat actions, operational guidance and battlefield environment by using data. Precise analysis should not only focus on the basic characteristics and laws of the cases, but also pay attention to the specific details of the cases; not only should we consider how the weak side can play its advantages, but also how to attack the weakness of the strong enemy.

3.2 The Research Method of Cases has Evolved from "Written Discussion" to "Experimental Platform"
The "written discussion" in the battle example teaching refers to summarizing the typical combat theories, successful experiences and lessons of failure in the case study in written form. "Written Discussion" brightens the "eyes" of battle example teaching and makes researchers see more clearly and farther. However, a single written discussion can not let the later generations really feel the continuous
development of the case plots, and it is difficult to experience the interaction of combat actions in person. But, the "experimental platform" can do it. In order to carry out the battle example teaching on the experimental platform, the first step is to design the combat cases, select the experimental verification points, set up the required experimental conditions, and then analyze and obtain the experimental results by establishing and running the simulation model on the experimental platform [4]. The experimental platform extends the "hands" of battle example teaching, which makes researchers feel deeper and experience more thoroughly. The "Written Discussion" of the battle example teaching mainly summarizes the cause, background, process and outcome of the case, and finally draws enlightenment, which is a basic analysis process[5]. If the intelligent simulation technology is used to carry out the battle example teaching based on the experimental platform, the coherent process of "observation-judgment decision-making action-reflection" can be carried out so that the researchers can practice on the experimental platform. The evolution of battle example teaching from "Written Discussion" to "experimental platform" is based on simulation technology, setting battlefield background, standardizing command process and opening thinking strategy. Therefore, the construction of battle example experimental platform is the logical starting point for simulation technology to influence future battle example teaching.

4 Intelligent Simulation Technology will Subvert the Battle Example Teaching Method

The deep study of battle examples will give birth to the innovation of combat methods. The application of intelligent simulation technology to battle example analysis is often accompanied by the arrival of new research methods of battle example analysis. In connection with the general procedure of case study, there are three methods of case study based on intelligent simulation technology, which will play an important role in the future.

4.1 Battle Example Teaching Based on Intelligent Countermeasure

The battle example teaching based on intelligent countermeasure(IC) is to use agent to replace entity in the research process. By observing agent confrontation or confrontation with intelligent opponents, we can directly understand how commanders create and capture fighters, how to obtain battlefield initiative, how to realize the transformation of battlefield situation under inferior conditions, and finally achieve the goal of winning.

Artificial intelligence can become a strong opponent of human beings in the game, and can also be used as one or more sides of intelligence in battle example teaching [6]. In the simulation case, the intelligent opponent can learn directly from the input and experience, and confront the human according to the established procedures or rules. Battle example teaching with intelligent countermeasures can be "human-machine (H-M)" or "machine-machine(M-M)" [7]. In the "human-machine" mode, the case analyst is one side of the case, and artificial intelligence is the other. The "human-machine" mode separates the deduction plot from the case process, so as to make full use of a certain plot in the case, expand the research space, and deeply excavate the potential value of the case through confrontation with intelligent opponents. The "machine-machine" mode is to set up intelligent simulation models for both sides or parties in a battle example, and integrate data, rules and entity models into a research platform for operation and systematic research. The "machine-machine" mode is mainly aimed at the overall problems or large scenes of the war, highly integrates the simulation resources needed in the battle examples, uses the visual operation interface and computer statistical analysis tools to complete the call, operation and analysis of the case data, so as to draw a macroscopic experimental conclusion.

4.2 Battle Example Teaching Based on Scenario Reproduction

Battle example teaching based on scenario reproduction(SR) is a new thing combining visual technology, especially virtual reality technology and battle example simulation experiment. It is a kind of battle example simulation research method with strong information characteristics. The history can be repeated in the "situation", and the process can be experienced in the "recurrence", which will certainly have a positive and beneficial reference for the exploration of new warfare methods and the
development of new weapons and equipment. At the same time, the battle example teaching based on scenario reproduction can also be used in military training, college teaching, weapon equipment demonstration, combat doctrine development and other applications. Scenario reproduction is a kind of simulation concept. Based on the battlefield scene in the battle example, the troops are organized to drill, and the troops are arranged in the virtual scene, so that the researchers can digest, absorb, integrate, inherit and innovate in the scene experience.

Battle example teaching based on scenario reproduction will give full play to the advantages of virtual reality technology and simulation experiment technology, and give researchers a strong sense of visual impact. This method is not a simple repetition of the war case process, but through practice to deeply experience the combat process, and complete the case study in the cycle of "research and judgment of situation - making decision - taking action - new situation". The battle example teaching based on scenario reproduction can display all kinds of combat elements and give real visual experience. At the same time, it also provides a good human-computer interaction function, which is convenient to adjust various battle example elements. Each experimental element is displayed in the scene to enhance the immersion experience.

4.3 Battle Example Teaching Based on Big Data Deduction

Battle example teaching based on big data deduction (BDD) is a research process in which all opponents in the case use big data to deduce, make decision and command counter (CC) on military actions in simulated battlefield environment according to the rules of battle examples. As a bridge between case practice and case theory [8], big data is the key link to improve the effect of battle example teaching. The combination of battle example teaching and big data deduction can give full play to the practical advantages of big data and make up for the lack of cognitive theory in battle example teaching [9]. This is an innovation in battle example teaching.

Battle example teaching based on big data deduction includes electronic map simulating battlefield environment, units simulating combat forces, notes and deduction rules for simulating various actions or action results. Among them, the deduction rule is a summary of the experience of the past combat cases, which is derived from the long-term accumulation of the case study and experimental data [10], and contains a large number of operational theoretical knowledge, operational practice experience and combat law training. Simulation and reproduction of battle examples with big data deduction can highlight the dominant position of the case researcher. Researchers can conduct systematic research on the problems in the case from the perspective of decision makers, and experience the influence of various complex factors on decision-making at that time. At the same time, big data deduction has become a process of re-experiencing history and creating history, so as to achieve the purpose of deeply studying the tactics of war, summing up experiences and drawing lessons.

5 Conclusions

The more scientific the research method and the more reasonable the practice mechanism, the more active people will be able to participate in the research. With the promotion of new technologies, the future battle example teaching will realize the shift of focus and the reorganization of methods, and its applicability and real-time performance will be significantly enhanced. Battle example teaching based on the intelligent simulation technology will build an interactive platform for personnel exchange, so that researchers can draw inspiration from the cases. In a word, the introduction of intelligent simulation technology into battle example teaching will certainly promote the renewal of the concept of war case study, and play a key role in further improving the quality of battle example teaching and giving full play to its benefits.

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