

LEAD THE TECHNIQUE OF DIGITAL MAPPING INTO TEACHING TRUE OUT NEW_TYPE GRADUATES OF SURVEYING AND MAPPING

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1. Background

With the birth of the computer, people enter into the information society. Because of computer being used widely, new development chance was brought up for the ancient cartography, at the same time, new challenge was developed also. Today, computer technology was used more and more, which affected the subject more widely and more deeply. As a result, great innovations have been happened in the map making means. As all known, in old days, we produced various of maps or atlases by manual mainly. Every step, from manuscripting, fair drafting, photographing, photocopying, color separating to printing, was finished by manual operating. The procedure is long cycle, slow speed, bad quality, and it is difficult to modify or renew. For a map, it is necessary to renew its contents every some time, we have to cost massive energy to repeat the mapping process, from the first step to the end. In fact, in the printing and publication field, people have adopted the techniques of laser_photolettering and computer_controlled photocomposition, said bye to “lead and fire”. Similarly, in the map making field, backward manual mapping work ought to give a way to the advanced computer operation techniques. Now map databases have been built gradually, it was more important to adopt the automated techniques than ever. Map databases together with the system of the map producing and publishing will become the main work tools for the survey departments in the future.

During the innovation and development of the map making procedure and techniques, all kinds of map crafting and carving tools will be replaced by advanced computers as well as graph and image input_output equipment corresponding, similarly, backward manual working procedure will also give a way to the technology of computer assisted graphy and image processing and the technology of screen printing as

well as the technology of laser outputting, though the disciplines and theories of cartography are still available. As far as our institute was concerned, there was a very important project, that is, whether the teaching and practising contents relating to the map producing ought to be adjusted? If yes, how to adjust on earth? In order to keep up with the pace of the development of science and technology, in order to lead surveying and mapping to the path of digitizing and modernization earlier, the institute teaching and the graduates developing must walk ahead of practice, at least keep the same rate. Only if did so, we could make greater contribution to the development of the technology in cartography. We should try our best to make the teaching adapt to the development of the high and new technology and reach the demands of the survey departments. It was also our aims to reform our teaching.

The next reason why we took the attempt to reform was we had accumulated a lot of digital production experiences and techniques, which were practical and mature, in the past years. In early 1993, in order to strengthen the build of the doctor degree plot of cartography, we bought a set of system of map producing and publishing from American under the backup of leader departments, in addition to our own efforts. The system had come up to the advanced world level in the early 1990s, which including a bi_screened workstation, a laser film outputting machine, some micro_computers and softwares corresponding. After installed, the Department of Cartography organized an energetic and powerful crew to exploit and apply the system immediately. They developed series of practical software according to the reality of our country, made huge amount of high quality mapping outcomes and products. All that put forward the build and development of the cartography subject, improved and renewed the current condition and surrounding of teaching and practicing, more importantly, turned out and exercised a group of young teachers.

2.Adapting to the demands of the development of surveying and mapping, reform the current contents of teaching and practising.

In the past, the teaching and practising contents were worked out according to the procedures of manual map making. Nowadays, owing to the use of the technology of computer mapping in some survey departments, the leader and teachers of our institute had realized in common that we should apply this kind of new technique to the teaching and practising for the undergraduates and postgraduates. In order to turn out groups of new_type qualified graduates for the survey departments, who possessing wide knowledge, high quality as well as strong operating ability, we ought to reform sharply teaching and practising contents that did not adapt the development of our society. As so, students could be familiar with and grasp at the new theory, new technique as well as new technology more rapidly, they could also know about the last development in the cartography field, moreover, could fulfil the corresponding exercises and tasks by the new techniques and procedures by themselves. This kind of exercise not only optimized

the teaching and practising courses, introduced a lot of new and high techniques, but also improved the knowledge structure of students, developed their abilities of analysing matters, solving problem as well as applying the new and high techniques. It could also help students to understand and acquire their subjects more deeply. Furthermore, its outcomes and softwares would play a great helpful role in improving the teaching of other cartography courses.

3. Organize carefully, require strictly, guarantee the quality of the teaching and practising.

New and high techniques being introduced into our teaching and practising, we asked for students to fulfil adequate practical tasks in order to ensure the teaching quality. The main task was digital atlas producing by applying the advanced computer mapping techniques. The size of the atlas was B5. It consisted of 182 sheets of maps, total 240 pages. Its technical preparing and making must be completed within half a year. Therefore the task was much heavy, complex and difficult. We organized a group of energetic and powerful teachers to instruct students. Every teacher was in charge of a part of the task and checked the students' work regularly. Before the task, we had done enough prepare for it. For example, we worked out a detailed practising plan, developed specific demands and disciplines for the whole process of the teaching and practising, edited the technique demands and the working guides corresponding. All that guaranteed the teaching and practising could be executed smoothly. During the course, the teachers and the students could discuss and analyze various of problem emerged in the procedures in good time. They learn one another, made out a lot of useful problem solving methods. Because new technique and working flow were adopted, it was important that students should possess higher ability of operating by hand and computer_manipulating. For that, we gave various lectures of techniques for 6 times, worked out 8 copies of rules and demands and compiled 6 softwares for the activity. By these works, in addition to everybody's efforts, we made a profound achievement. The outcomes have come up to the advanced civil level, its high quality was praised widely by authorities and users relatively. The outcomes on this teaching and practising have been published and issued 6000 copies, which were put to use in practice.

4. Some acquisition and experience

It was an attempt for us to reform the teaching contents by introducing the new and high techniques into the cartography courses in order to raise the students' comprehensive skills. It was proved that the attempt and the innovation were not only much successful but also quite useful for our young teachers, whose knowledge and abilities were improved greatly. The contents and management measures could be used and spread in the future. From the innovation, we could learn groups of treasured experiences, among which there were five main acquisition and experiences.

(1) It combined three directions of cartography subject, traditional mapping, computer

mapping, map printing, into a whole. So that it brought out a new idea for the teaching and graduates_developing of the Cartography Department.

- (2) It innovated current teaching contents and methods all_roundly, extended the knowledge limit of the students, and exercised their abilities in operating by hand, problem solving, computer manipulating. Therefore, it was much important to strengthen the students' ability of qualifying for the first job and to turn out be comprehensive developed specialities.
- (3) It combined teaching with producing. Both the students and the teachers took part in the new attempt, from theory to practice, from test to produce. It is quite helpful for teachers to renew their knowledge and improve their ability.
- (4) It examined various of theories, methods and softwares related to the digital cartography. As a result, we had a solid basis of practice on the field, some corresponding research and practice have reached the advanced world level. The teaching in cartography have jumped to a new grade. Moreover, it played a very important role in the whole build and development of the Department of Cartography.
- (5) This kind of teaching and practising activity could also help and stimulate other survey departments to change their map producing procedures and adopt the new techniques to fulfil their mapping tasks. The graduates will play an important role in spreading and applying the new technique to their departments.