

EXPERIENCES OF COMPILING CET MODULES

Zentai, L.

Department of Cartography, Eötvös Loránd University, H-1117 Budapest, Pázmány Péter sétány 1/A.
Fax: + 36-1-3722975. E-mail: laszlo.zentai@elite.hu. Website: <http://lazarus.elte.hu>

ABSTRACT

The Commission on Education and Training (CET) of the International Cartographic Association is the standing commission designated to help improve cartographic education and training worldwide. In the last period (1999–2003) one of the most important projects of the commission was the organization of the Internet Cartography Teaching Program on the basis of the Basic Cartography. We agreed on the level of these courses and we decided to prepare it at B.Sc. level. The next stage of the process was to create a list of the topics, define the modules and find the proper persons that were capable of writing certain modules.

The commission tried to involve different ICA commissions for preparing the modules of the electronic program. The original aims of the Commission were:

- Adding some chapters on national cartographic schools;
- Offering the possibility of translating the Program into various languages;
- Dialogue rolling in the electronic medium.

The paper would summarize the experiences of the two modules created by my department. The most exciting question was the filtering of the materials to define the imaginary B.Sc. level: we had to standardize the cartographic knowledge. The aim of cartographic courses is different in different countries and universities: some of them are focusing on GIS, while others on geodesy, thematic cartography or map publishing. We tried to define the B.Sc. level for each module.

There were two modules identified: Map projections, and Graphic file formats and conversions. The first one is a relatively stable area; leastways the changes are not very dynamic. The subject of this module is well prepared, so we could easily suggest additional literature for the potential students. The main question was the approach: should it be mathematic and scientific, or the technical information should be less important, because we are only users.

The second module is rather different in character, and it is related to computer science, so the changes are rapid on this field. We had to write this module as software independent as it was possible, which is not very common. Most of the traditional university courses on this field are concentrating on certain software, but even there exist some really international cartographic software products. We decided to describe standard formats, but not certain software.

1. INTRODUCTION

The prime objective of ICA Commission on Education and Training (CET) in the last period (1999–2003) was the “Internet Cartography Teaching Program”. The commission was chaired by Vladimir Tikunov (Russia) in this period.

When the initiators of this project agreed on the principles they had taken into account the following possibilities:

- Organization of Internet Cartography Teaching Program on the base of Basic Cartography (3 volumes and an exercise manual were published in the beginning of 90's);
- Involving different ICA commissions for preparing chapters of electronic program (this was a logical plan to include other experts);
- Adding some chapters on national cartographic schools;
- Possibility for translation the Program into different languages (this would give the chance for the local ICA bodies to fine tune certain modules on national level if necessary);
- Dialogue rolling in the electronic medium (distance learning, web materials).

We talked about the level of these courses and following items were taken into account before making the decision:

- the aim of cartographic courses is different in different countries and universities;
- in some countries there are no independent courses for cartography in university or in high school level (for smaller countries the alternatives are less specialised and the education and training is less frequent);
- some of the courses are too specialized for all cartographers (focus on GIS, geodesy, map history, map publishing, infographics);

- naturally, the computer based cartographic courses can be the skeleton of the whole project, but the courses must be as software independent as possible.

Because of these factors we suggested the production of the courses at B.Sc. level. This level is most common in several the countries. The following benefits can make the project successful:

- in some countries this project can be the only opportunity for teaching;
- it can be used as a supplement to existing courses;
- it can provide a possibility to upgrade similar existing courses;
- it may provide a standard for comparison with existing courses.

2. LIST OF TOPICS

The next stage of the process was to create a list of the topics and define the structure of modules. The number of planned modules (subjects) was about 20 and these modules would cover all subjects which are not country specific (such as national topographic maps, national map history). There are probably no cartographic curricula existing in any university or high school to include all the modules, but this is totally understandable. Nevertheless, we would keep the content of certain modules as a minimum to teach at that level.

The initial list of modules was the following:

- Maps and cartography: principles in cartography, basic terms (together with the Theoretical Commission).
- Cartographic representation (this module would focus on the theoretical aspects, the practical questions would be discussed in other modules).
- Map projections (two modules: the first is planned to be mostly theoretical-mathematical and the second one would be more practical).
- Generalisation (this is a very important part of every cartographic curriculum – we planned 2-3 modules to cover the whole area of the cartographic generalisation; we would use the main advantage of the web-based course: to show examples easily).
- Map use (this module can be useful in every structure: it is similarly important for GIS experts, map producers, geodesists, etc.).
- Topographic mapping (two modules: these kinds of maps are used in every country as basemaps – the representation of relief, the navigation and the legend can be important parts of the modules).
- Atlases (this module is relevant mostly in traditional cartographic courses, but can be important even for some GIS experts).
- Statistical map design (supplementary material for thematic cartography, interactive web techniques can be very useful to represent the possibilities).
- Colour use (this topic is more and more important nowadays, because colour-printing facilities are easily accessible for the normal users).
- Toponymy (this topic can be thought provoking for everybody who previously dealt with any parts of cartography).
- Reproduction techniques (traditionally this involved only offset printing, but the digital processes and computer printing are much more important these days).
- Cartography and GIS (one of the key modules, the explanation of the relationship of these two disciplines can provide essential information).
- Databases (this topic is independent from cartography, but indispensable for cartographers dealing with GIS and computer cartography).
- Digital mapping (this is a very complicated part, which may require two separated modules: theoretical and practical – it is difficult to make it software independent).
- Graphic formats and conversion (this topic is not connected directly to cartography, but this module can summarize basic IT knowledge).
- Internet mapping (webcartography is the most “fashionable” part of cartography in these days – incremental updating is a must).
- Legal aspects and copyright (this topic can be country specific).

Most of the modules would require continuous update; therefore, asking experts to be responsible for a certain module would be a logical organization. The difficulty of this job is to think at international level and not to fit the module unconditionally to an existing cartographic course word by word.

Naturally, this project was planned as a continuous task and the main problem was that it was impossible to realize our plans. The recruitment of new CET members and the re-activation of previous members were not successful in this period. Even producing one certain module would require the co-operation of several experts, but because of the lack of intention for participation in the project none of the projects be may regarded completed.

The above list of modules is not a complete enumeration, for example, modules about map history or remote sensing can be useful in most courses. Unfortunately, this project has not become well known for cartographers, we have not reached the “critical mass” to make the project self-developing.

3. SAMPLE MODULES

The first CET meeting was organized in Budapest in February 2000. There were only few participants (<http://lazarus.elte.hu/hun/dolgozo/zentail/ica/cet-part.htm>) and this tendency continued on the next meeting in Apatity (Russia) in August 2000. The whole project would be based on the collaboration of cartographic experts from different countries. Instead of working on the modules, the few participants of meetings discussed the structure of the teaching materials and the potential problems.

The first sample module was created at my department (Projections) and the first version was ready for inner discussion in July 2000. We developed another sample module in the last CET period (written by me): “Graphic file formats and conversion”. The third module, “Methods of cartographic representation” was developed by Anton Ryazanov and Vladimir Tikunov (Integrated Mapping Laboratory, Geographical Faculty, M.V.Lomonosov Moscow State University). A template was developed by Barend Köbben (ICA, Netherlands) in 2002 to methodically and graphically fine-tune the project. This suggestion can be a base of the next modules if the commission agrees on this structure.

All three modules were treated as samples by the authors and now I will summarize the experiences. I was involved directly in two modules.

We assumed the following requirements:

- participants are in possession of basic computer knowledge;
- participants must have access to the Internet several hours per week (it can be a home access, but in the less developed countries a centralized course with limited web access may work);
- access to the computer facilities of a department (software, printer, scanner);
- a traditional library - to provide some basic literature and allow the participants to access additional books and papers;
- the authors have to refer to a literature in the course which can be accessed through the web.

Although the first sample modules were developed without a clear, well-designed guidance as to what we are trying to achieve, we can summarize our experiences:

- always remember the final goal, the B.Sc. level – I assume every expert of a certain topic is keen on adding more information about the subject;
- design the course, like a normal university course;
- it is very good if the author of the module is familiar with the available presentation methods and techniques of the web environment;
- split the course into logical chapters (units), which require about the same length of time to acquire – this can help the students to plan their study;
- always test the course with the potential users, ask for feedback (use a questionnaire if necessary or simple discuss the experiences personally);
- give hints for students who are interested in specific fields (literature or web links can be enough in most cases);
- use graphics as many times as it is necessary – take into consideration the characteristics of the media: the graphics must be specially designed for the screen representation, which requires efficient filtering of the content;
- always take into consideration the possibilities of less developed countries: the Internet connection can be very slow (low bandwidth), so the size of image files must be optimised, which requires a good knowledge of raster images – if you want to use large image files (maps) the best solution is to use them on separate pages (separate window);
- we suggest to avoid using the newest web techniques, the computers in less developed countries can be out-of-date, these computers are not able to use the newest versions of the web browsers or these new versions can slow the operating speed;
- using vector based web techniques (Flash or other file formats, like SVG) should be carefully tested or it is probably better not to use these kind of features, because they are not supported by the browsers directly (plug-in is required);
- if we let the whole course material download for off-line use we should use simple techniques, which perfectly work even in off-line environment;
- the basic units of the module (separate HTML files) should be short;
- long (and wide) pages require extended use of scrolling bars which can be troublesome for most users, the suggested resolution is 1024*768 pixels.

The “Map projections” module summarizes a relatively stable area; leastways the changes are not very dynamic. This area is well prepared, we could suggest additional literature for the potential students easily. The content of the module can be easily organized into logical small chapters. During the compilation the main question was the approach: would it be mathematic, scientific or are we should produce this module only for ordinary users for whom the technical information is not important.

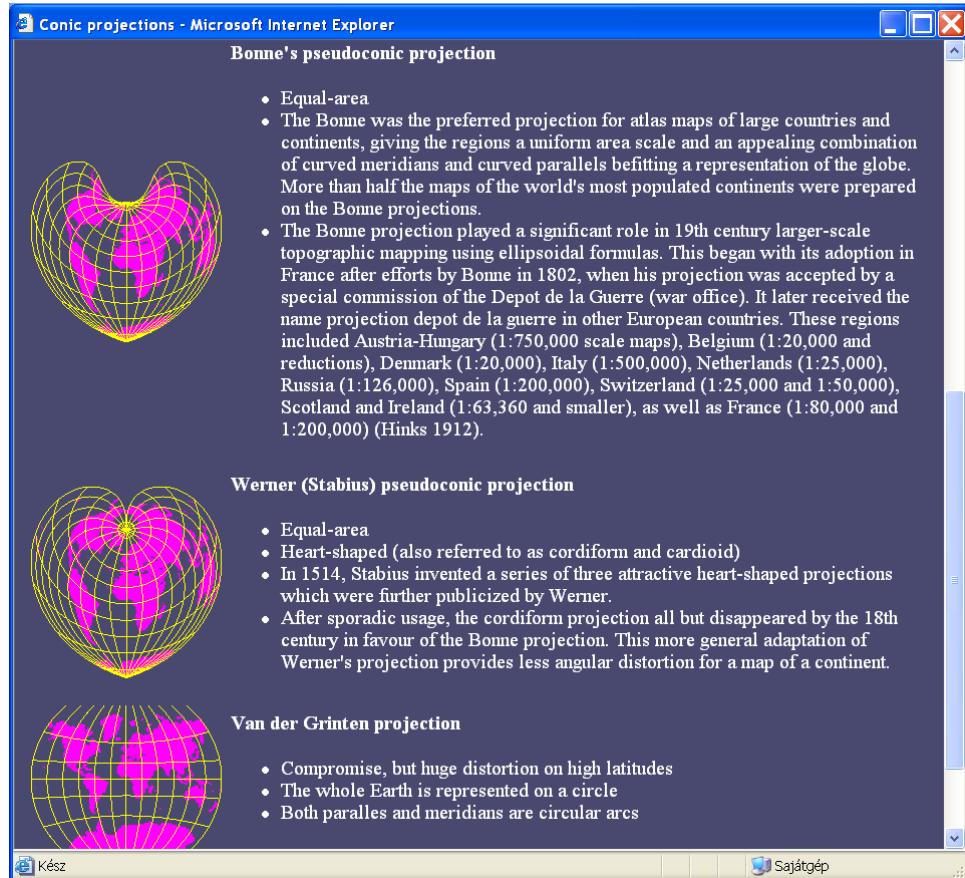


Figure 1. Part of the “Map projections” module (Conic projections)

The other module “Graphic file formats and conversions” is different, it is related to computer science, and the changes are rapid on this field (sometimes the changes are extremely rapid based on the development of IT). We had to write this module as much software independent as it was possible, which is not very common in this field. Most of the traditional university courses on this field are concentrating on certain software, but even there exist some really international cartographic software products. We decided to describe standard formats, but not certain software. Software may disappear after some years, but the life cycle of graphic formats looks more stable.

The important part of the modules is the test. Questions can help the students to understand the content of the module and prepare them for the exam. The various levels of questions can be useful for the students to acquire the teaching material. We have to take into account the different levels of students: for some of them the module can be one of the most difficult, while for few of them this module can be quite easy. Of course, the methods of testing highly depend on the topic. It was relatively easy to prepare a lot of questions at various levels for the “Map projections” module. But for the “Graphic file formats and conversions” it was more difficult. This module may contain brand new information for the students, so one of the main roles of the test questions is to repeat the important information of the module. The third module “Methods of cartographic representation” is again something different. This is mostly a theoretical subject, but the logical structure of different methods may help to write good questionnaires.

Hopefully, the new Commission on Education and Training in the next period will continue this project and will be able to finalize all modules. These modules may help the ICA to give up-to-date teaching materials for cartographers to ensure the uniform level of cartographic diplomas at B.Sc. level.

EXPERIENCES OF COMPILING CET MODULES

Zentai, L.

Department of Cartography, Eötvös Loránd University, H-1117 Budapest, Pázmány Péter sétány 1/A.
Fax: + 36-1-3722975. E-mail: laszlo.zentai@elite.hu. Website: <http://lazarus.elte.hu>

Short CV

Born in 1959.

Qualifications:

M.Sc. in cartography, Eötvös Loránd University, Budapest 1984
Research scholarship to Helsinki University (1990), Karlsruhe University (1994)
Ph.D. in cartography, Eötvös Loránd University, Budapest 1995
D.Sc. procedure started in 2003

Positions (at Eötvös Loránd University, Department of Cartography):

Lecturer 1988–1992
Assist. Prof. 1992–1996
Assoc. Prof. 1996–

Subjects to teach: Digital cartography, Topographic maps, Representation of relief, Orienteering maps

Major publications:

Atlas of Central Europe (1993)
Atlas of leading and 'avoidable' causes of death in countries of Central and Eastern Europe (1997)
Számítógépes térképészeti ('Computer cartography') (2000)
Administrative atlas of Hungary 1914 (2000)
Geschichte Ungarns und Finnlands CD-ROM (2002)

ICA activity:

- Member of the National Committee of ICA since 1991
- Organizer of the Joint meeting of the Commission on Education and Training, Commission on Map and Spatial Data Use, Commission on National and Regional Atlases – Visegrád, Hungary, 1993.
- Corresponding Member of Commission on Visualization (1996–2000)
- Member of Commission on Maps and the Internet (1999–2003)
- Member of Commission on Education and Training(1999–2003):

Other activities:

Active senior orienteer
Member of Map Commission of the International Orienteering Federation, 1996–2002
Chairman of Map Commission of the International Orienteering Federation, 2002–