

No Educational Progress in Geomatics without Web !

Prof. Jean-Robert SCHNEIDER, Switzerland

ABSTRACT

The present teaching methods must consider the importance of images in our society, the zapping trend of the people and the development of the computer assisted learning. So today the internet technology is an important tool of the professional education and, of course, especially in geoinformation. Now the geoknowledge is within reach of the Web.

Is the world wide web a support or a rival of the teacher ?
Is it an effective help or a futile game for the student ?

This paper is focused on the teaching experience of the author as in an Federal Institute of Technology (academic University) as in a High Technical School (University of applied Sciences). It explains how and why his students use many web sites with benefit, especially in cadastral and land consolidation programs.

RESUME

Les nouvelles méthodes pédagogiques doivent prendre en compte l'importance de l'image dans notre société, la tendance des gens au zapping et le développement de l'enseignement assisté par ordinateur. Dans ce contexte, la technologie Internet apporte une plus-value indéniable à l'enseignement professionnel, tout particulièrement dans la formation en géomatique. La géoconnaissance est dorénavant à portée de web.

WWW : collaborateur ou rival de l'enseignant ?
Aide efficace ou simple distraction ludique pour l'étudiant ?

L'auteur qui enseigne à la fois dans une Ecole Polytechnique Fédérale (université académique) et dans une Haute Ecole Spécialisée (université de sciences appliquées) explique comment et pourquoi ses étudiants consultent avec profit des sites web, notamment dans les disciplines cadastrales et de gestion foncière.

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1. FROM SURVEYING TO GEOMATIC EDUCATION: THE ROLE OF THE WEB

Yesterday's surveyor has given way to tomorrow's geomatician. Formerly a respected land surveyor, he has turned into a manager of spatial data. His field of activity has become extremely broad, comprising varied jobs such the determination of forest boundaries, the real estate report, the protection of biotopes and the project of bike tracks.

Computers have been invading his job in successive waves: simple algorithms, more elaborated software, graphical interaction and OpenGIS. The Internet technology is especially well-adapted to the field of geomatics, since it offers wonderful opportunities to acquire, visualize and diffuse georeferred graphical data.

In the old days, the school used to be the source of the desired information, as well as the place where teachers' knowledge was transmitted to the pupils. But today's school has lost this monopoly on information. The Internet tool allows students to enrich their knowledge directly and without human intermediary.

Is the Web a support or a rival of the teacher ? Is it an effective help or a futile game for the student ?

The following general considerations result from the author's own pedagogic experience in the fields of cadastral survey, land consolidation and land information systems, since he has had the opportunity to teach for twenty-seven years in a high technical school (*Fachhochschule*) and simultaneously for fourteen years in a federal institute of technology.

2. THE ADVANTAGES AND THE DANGERS OF THE WEB GENERALLY IN TEACHING

2.1 Some Advantages

2.1.1 For the Students:

- FREEDOM: students are free to choose their place of consultation, the moment of study and their way of working, even though this requires more personal strength, since they are left on their own to work.
- ACTIVITY: students don't attend an ex cathedra class passively anymore; instead they are forced to search by themselves, activate links and answer questions.

- **MOTIVATION:** surfing on the Web bears an undeniable play-like aspect, that is reinforced by a spirit of competition when it comes to show the rapidity of one's research as well as the originality of one's discoveries.
- **CURIOSITY:** the discovery of a website urges students to look elsewhere for something better, and then pushes them to comparison in order to enhance the quality of the gathered information.
- **UNIVERSALITY:** the Web does not only show what exists at home, but also what there is to find at the opposite side of the world. This opening on the multicultural world represents exotic discoveries that often teach many things, such as tolerance.
- **CRITICISM:** confronted by a full range of data whose quality may vary, students have to use their capacity to judge, since they may find themselves in front of statements that sometimes deceive. Not every item is of the same value nor of the same interest.
- **COMMUNICATION:** students have the opportunity to use various services at their disposal, such as e-mails, in order to communicate with those who share the same interests.

2.1.2 For the University:

- **NUMBER OF STUDENTS:** an illimited number of students can have access to the same class simultaneously; this eliminates the risk of a numerus clausus, which constitutes a political problem.
- **INFORMATION:** the website of the institution provides useful information about the conditions of studies, class programs, registration fees, the main internal rules and the offers in continuous formation.

2.2 Some Dangers

2.2.1 For the Student:

- **LACK OF STRUCTURE:** since the information is not always logically organized nor hierarchized (what is important is mixed with secondary, even useless, material), students waste a lot of time researching and sometimes have to leave the matter to chance. They even get connected, voluntarily or not, to websites that have nothing to do with what is taught !
- **CONNECTION:** only information that costs nothing and that can be accessed without password is being consulted by students.

- **DISINFORMATION:** even though they are free, many websites still are of purely commercial nature; there, the information is often suggestive of an intention, or even strongly manipulated.
- **SHELTER:** students that are used to working with computers should be careful not to hide their incompetence by using as a kind of excuse or protection.

2.2.2 For the Teacher:

- **INVESTMENT:** putting a class on Internet represents a lot of time, as well as a lot of money, because it does not only consists of adding pictures and hypertextual links to a text.
- **SEVERITY:** a teacher who puts his class on Internet with a free access must check its content with care, since it is a broad public that may refer to it, including informed professionals.
- **COMPLEXITY:** the author of a course that is available on Internet must realize that students will get quickly discouraged if the connection does not offer an easy, logical procedure.
- **SUBSTITUTION:** offering a class on Internet does not replace a written handout to the students, since a hard copy allows them to underline it and complete it with personal notes and sketches. A hard copy offers a better overall view and makes preparation for an exam easier.
- **FUGACITY:** nothing is more ephemeral than a list of web-addresses mentioned during a class.
- **ISOLATION:** a class that is provided on Internet does not allow students to benefit from their mates' reactions and questions, even though these allow the professor to specify his thought or to choose an example in accordance with the situation.

3. THE ADVANTAGES OF THE WEB ESPECIALLY IN GEOMATICS EDUCATION

3.1 Geographical Grounds

Geomatic deals with data that have a spatial dimension. A computer-based exercise requires a digital geographical ground, in the shape of a map extract, a cadastral plan extract or an orthophoto. The free offer of such documents on the Web is constantly increasing.

3.2 Territorial Inventories

The quality of a land management project involves a serious analysis of the ground constraints: numerical ground-model, state of patch, web of communications, restrictions of the ground usage, protection of ecological zones, etc. In Switzerland, many counties provide free web-counters where these useful inventories are available.

3.3 Geodesical References

Integrating data that are emerging from different sources into one reference system is one of the the geomatician's important tasks. Some websites put the official updated geodesical basic data at the public's disposal, and thus also at that of students.

3.4 Legal Requirements

A widespread legislation regulates the main fields of the geomatics related to the territory: land planning, reallocation of parcels, cadastral survey. Nevertheless, laws keep increasing and adapting themselves to the evolution of society, particularly in the field of environment. Let's think about "Cadastre 2014", which aims not only at regulating the geometrical restrictions of property in the private sector, but also at doing so in the public one.

In the old days, professors had to obtain the most important laws on paper, with separated sheets for the articles that had been modified after the last edition. Today, laws are available on the Web in a version that is constantly updated. Students only print what is useful to them. It is also possible to consult part of the jurisprudence.

3.5 Pedagogical Documentation

Using illustrations and concrete examples are two important pedagogical features for a good teacher. Many government services and several private offices provide illustrated examples of their field of activity and of interesting realizations on the Net. Urging students to consult some well-selected sites makes it easier for them to understand the theory they have been taught.

3.6 Technical Drafting

Students of geomatics especially like to enrich their technical reports with pictures taken from Internet, such as landscapes, logos, city shields, map extracts, archive documents and humorous sketches.

4. THE AUTHOR'S PECULIAR CONTEXT

4.1 Variety in Education

The author has been teaching land development for many years to future gematicians both in a polytechnical academy and in a university of applied sciences (Fachhochschule). He hasn't noticed any major differences towards the Web among students from these two programs. In both cases, the best students are able to use Internet wisely, as a complement to their education, whereas less talented ones think they might manage to hide their ignorance by consulting many websites and using printers a lot !

In a theory course, students have admitted using Internet mainly to resolve computer problems. For semester projects and degree works, they prefer looking for geographical data

and concrete examples rather than explanations related to notions they haven't understood. They appreciate references to addresses and names of people they can get in touch with.

4.2 Federal system

The author teaches in Switzerland. This country is a confederation made out of 26 partly sovereign states, where each one has its own legislation; this can lead to major differences concerning fields related to the territory activities. That is why courses about land management are based on a double legislation: the federal one, on the level of the country, and the state/cantonal one, on the level of the area. Since it is impossible to teach 26 different reference frames, students can turn to Internet to check the legal particularities that apply to them.

4.3 Multilingualism

In a country where four national languages cohabit, it cannot be avoided that a minority of students receive their education in another language than their mother tongue. Some of them can go back to Internet to search for a term they misunderstood or a document in the language they know best. There are of course translation programs on Internet, but when they are applied to specific texts, they sometimes give very sketchy translations.

Also, using Internet in a multicultural country is certainly a big help for the national cohesion, since everyone can view and enjoy documents that are written in other national languages.

5. CONCLUSIONS AND PERSPECTIVES

It is obvious that without Internet, geocomputing would never have known the development and the universality that characterize it today. The new technologies in the fields of information and communication are opening pedagogical perspectives, whose consequences for our university departments cannot be measured yet.

No geomatic education without the Web, we said in the title. Indeed, but information is not education. My students are aware of this fact, as some of their reactions testify:

- "The Web completes the teaching, but isn't a substitute for the teacher."
- "The Web leads to information, not to learning."
- "The Web is useful, but not essential now."
- "We must know how to use it without abusing from it."
- "It relieves us from travelling to get hold of a document (like a map of canalisations or a list of parcels) but not from coming to class."

And, as a conclusion, here are a few suggestions for the FIG:

- Urging the secretariat of commission 2 to create and then update a list of web-addresses that would enhance the most interesting international courses, not according to countries, but rather on the basis of the field that is taught.
- Asking each FIG commission to create a link from their homepage to the part of this address list that concerns their field in particular.
- Formulating a few recommendations on the access and the usage of courses published on the Web; this should be done students and the public at large.
- Organizing as an experiment a "mini web-congress", which would spare time and money (especially in transports), with the inconvenience, I admit, of reducing the direct human contacts. But, dear colleagues, if we wanted to meet in Washington, it is because we believe that telecommunications don't replace the conviviality of our meetings, that is what creates this spirit of congress so dear to our FIG events.

So, is the Web going to substitute the teacher, one day ? As one of my students answered mischievously and wisely: *when you turn the computer off, there's nothing left any more !*

REFERENCES

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BIOGRAPHICAL NOTES

Professor Jean-Robert Schneider was born in 1945 in Montreux, the city of the XVIth FIG Congress (1981), in the French part of Switzerland. He is graduated in surveying and rural engineering.

For many years, he teaches land management at the Swiss federal institute of technology in Lausanne (EPFL) and at the engineerschool of "Etat de Vaud" (EIVD) simultaneously. He teaches cadastral survey, land panning and land information systems too.

For 1990, professor Schneider is the Swiss delegate to the FIG commission 2.