ICT and historical skills[1]

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I. Introduction

Nobody doubts the benefits of a basic intellectual education that permits us to define our place in society. Although this may seem self-evident to us now, it was not taken for granted in the Early Middle Ages: in those days, a solid intellectual training used to be the privilege of the clergy, and the language of instruction was Latin. Around 1100, however, an intellectualization process began which gradually reached social classes other than the clergy. This change was mainly brought about by the influence of literature that was written in vernacular. In the Middle Dutch language area, Jacob van Maerlant, himself raised within the Latin tradition, became a passionate defender of rendering existing knowledge accessible to the inquisitive higher middle class, be it in a form adapted to their lack of intellectual background.[2] He thus laid the foundations for the development of didactic literature in vernacular in the Low Countries.

Today, we witness a similar proces of accelerated diffusion of knowledge. The present-day information- and communication technology enables us to contact people from other continents or to gather information on any possible subject in no time. The age-old ambitions of Van Maerlant seem to have become reality. Yet, some critical observations remain to be made. What about that part of the world population which does not have access to the information providers? And what about those who can't find their way in an automated landscape which contains not only quality information, but just as much pulp? Gathering information and acquiring knowledge are two different options. The acquisition of knowledge and skills forms an essential prerequisite for being able to cope with the over-supply of information, and it should therefore constitute a crucial part of young people's education, to allow them to master the new environmental conditions of our time. It is this belief that formed the starting point of the *Maerlant*-project.

The research project intends to bridge the gap between history science, history instruction and the practice of teaching history. This ambitious goal results from the growing conviction that historical understanding can only be developed when pupils also become familiar with the research methods of the historical discipline. This doesn't mean that they have to become historians in the full sense of the word. Although the past is an inspiration source for film, literature or television (to name just a few media), the youngsters probably won't be confronted with history (in a technical sense) in their future professional life. Nevertheless, we are convinced that the basic principles of the historical research method can be of great importance for the general development of young people. The problem-orientated gathering, arrangement, analysis, interpretation, and evaluation of information are indispensable skills to orient oneself in the complex world of today and tomorrow.

II. Trends in history instruction

1. What is the function of the history instruction in our present-day information society?

When formulating aims for history education (and for computer use, which is neither more nor less than a help), one has to avoid what Knoers calls 'the aim-means thinking'[3]. Market forces increasingly influence the organization of secondary and higher education. Study subjects that seem to lack immediate utility are threatened. It goes without saying that this trend has an important impact on young people's choices and opinions. History as a school-discipline apparently loses its relevance, and not only social factors are responsible for that, but also obstinate prejudices and factors related to the instruction of history. Quite some Flemish pupils agree with the typification of history as "a discipline at school and nothing more", as "something dead and past that has nothing to do with my present life".[4] After questioning German pupils, Bodo von Borries comes to comparable alarming results: despite numerous history lessons, the pupils display a limited historical knowledge, a lack of historical insight, acceptance of conventional interpretations and the incompetence to reach a personal and balanced value judgement.[5]

The ideas pointed out correspond with what Nadine Engels calls the "business-like view of education". Characteristic of educational practice is the stress put on individual performances and competition, an unlimited trust in a completely objective and impartial science as a source for all knowledge and a strong hierarchical structure and control apparatus. Nevertheless new needs seem to undermine this model. A one-dimensioned, cognitive approach of knowledge doesn't fit in with a society where a flexible and self-dependent knowledge acquisition is needed and the demand of a critical attitude and value development becomes more clear.[6] According to De Corte the following four components are essential for skillful learning, reasoning and problem-solving:

-a well organized and flexible domain-specific knowledge base
-heuristic methods
-metacognitive skills
-affective aspects.[7]

The unavoidable transformation of our industrial society into an information society, however, creates new possibilities for history in the classroom. "Today's education system faces the challenge to prepare individuals for the information society in which one of the most important aims is to handle information."[8] In this, history education can play a crucial role. "Our society, controlled by newsmedia and overwhelmed by an avalanche of information, more than ever creates the need for critical citizens who can handle information material, no matter how it is presented. The transferability of the aims related to the historical use of source material is important and can hardly be overestimated."[9] Nevertheless, classroom practice seems to be different. In a report on the state of history education in Europe, S. Barschdorff concludes: "Teaching methods, the use of media and the goals of teaching history, as observed by the students, are rather traditional. Dominating this are the storage of facts, textbook use and the narrations of teachers. Empathy, the reconstruction of past situations, project work and modern media are really seldom encountered. This is not in harmony with

students' wishes. They prefer by far audio-visual media, sources and documents, and museums to their textbooks."[10]

The debate about the content of history courses in secondary schools can only be intensified by the tendencies that have been outlined above. In the Dutch-speaking language area, there finally seems to have been reached a consensus on what are the basic principles and the ultimate goals of history education.[11] History is more than simply gaining factual information about historical events.[12] Studying the past should result in historical insight. To reach this specific type of knowledge, pupils have to become familiar with historical thinking and thus with the underlying structure of the discipline. Each scientific discipline has its own methodology, its own concepts and patterns of reasoning. During the sixties J.S. Bruner already marked that "there is nothing more central to a discipline than its way of thinking. There is nothing more important in its teaching than to provide the child the earliest opportunity to learn that way of thinking - the forms of connection, the attitudes, hopes, jokes, and frustrations that go with it. In a word, the best introduction to a subject is the subject itself."[13]

As far as history is concerned, the following three components can be distinguished: firstly, history can be viewed as insightful knowledge of the past, as the story of past reality (i.e. as providing information about the content of the past). History can, however, also be interpreted as an enquiry into the past (i.e. procedural information). Finally, history can also be considered in its function of making sense of the past, of looking into both the values and norms of the past and our present-day perspective on them.

Content information and procedural information are represented through, resp. content or history concepts (for instance, Middle Ages, crusades) and procedural or structural concepts (for instance source, fact).[14] In order to make sense of the past, both types of information are used in function of the notions of construction and discussion characterizing the historical discipline and representation.

It is precisely the domains of procedures and of concept development which allow pupils to train themselves in specific historical skills that are nevertheless transferable to other fields of knowledge. As a result, history education acquires a general educational value, thus contributing to the ultimate goal of secondary education.

2. History skills

Structural concepts which form an essential part of historical development can be linked to historical skills. What follows is a brief overview of a number of basic skills as presented in the *Design of vision.*[15]

-The skill to set in time (on a time scale), to locate geographically (on a map) and to situate within the appropriate social area.
-The skill to recognize the social dimension, that means to be able to put in one's proper words which evolution and/or change has originated from the interaction between individuals and groups in a certain time, space and social field.
-The use of professional terminology such as: historical facts, concepts, relations, processes, structures, eras and cultures, ...

-The use of historical concepts and the fluctuation of their meaning. The skill to link them up with new contents and put them into practice in the act of solving problems.
-To apply the principal questions of historical criticism to a relevant source.
-To apply a historical method.
-The recognition of continuity and discontinuity, of synchronism and dissynchronism.
-The recognition of coherence and interaction of the various social fields.
-To situate events within the correct cyclical and or long-term tendency.
-To demonstrate that all historical knowledge is a matter of discussion and construction.
-The skill to investigate contents starting from a relevant definition of a problem.
-The skill to reason in a manner that is aimed at solving problems.

3. Historical enquiry and conceptual development as main principles in history teaching

One of the key elements of historical thinking is the critical examination of historical sources, which forms a formidable challenge to younger pupils.[16] To avoid that pupils consider the history course as a series of established facts, a confrontation with the historian's methods is essential. It can make pupils aware of the controversies (the historian's story reflects only part of reality) and uncertainties (there may exist different versions of one and the same historical story) that are characteristic of the historical discipline. Yet, research in the United States has shown that these two features of history are largely neglected in history coursebooks.[17] The confrontation with historical sources gives pupils the chance to gain insight into the way in which historians give shape to past events that are only partly comprehensible. Too often, history in the classroom becomes, as Dalhuisen and Fontaine put it, 'infantilized'.[18] Sources are abbreviated and adapted until they suit the facts that can be dealt with in one class. They form selected, prefabricated and cracked nuts and the stereotypical rather than critical questioning of the sources hardly represents a challenge for the pupils.[19]

In order to come to a more accurate examination of sources, the pupils have to gradually refine their domain-specific conceptual apparatus. This process can take place throughout the secondary school years. "Concepts are not formed by passively copying a given definition and a series of examples; the learner actively construes them by dealing with and thinking about the study material. (...) There are various levels of conceptual development, ranging from no mastery, over partial to complete mastery."[20]

The *End targets* and the *Design of vision on historical formation*, which, in Flanders, form the basic documents as far as the actual study programmes for history are concerned, offer a framework for structuring concepts and knowledge. The facts and data that are treated in class can be assimilated according to the information structure of the discipline, based on dimensions of time, space and the social dimension which includes components of society (i.e. socio-economic, socio-political, socio-cultural conditions of life).

III. ICT: social conditions, design and development

1. Social developments

When governmental decisions have to be made concerning the introduction of ICT in schooling, several options are open. Hawkridge formulated a number of so called 'rationales' which play a part in decision making. We will name a few:
-the social rationale: all pupils need to have access to ICT to be prepared for their future role in society;
-the profession-oriented rationale: pupils have to be prepared for their future profession where the use of computers is demanded;
-the educational rationale: ICT can be used to optimize education and learning processes;
-the catalytic rationale: ICT is seen as a catalyst for changes in education.[21]
At first, the social and profession-oriented rationales seemed to dominate, but nowadays more and more attention is payed to the educational and catalytic rationales. Tjeerd Plomp predicts a more fundamental integration of ICT as an aspect in education and for applications oriented towards the acquisition of productive skills.[22] The *Maerlant*-project also focuses explicitly on the educational and catalytic rationales.

The importance of ICT for contemporary schooling is increasingly acknowledged. In Flanders governmental support for self-dependent working on the one hand and the use of ICT (in favour of the previous educational aim) on the other is growing. In September 1997 the Internet-project of the Flemish Community started in 175 schools.[23] A month later the Flemish government agreed to a project on the use of ICT and educational software. More recently the Flemish Board of Education delivered a report in which they formulated the advantages of ICT in general and for specific subjects in particular. We will give a brief overview of the main topics raised in the document concerning history education. ICT can offer an instructional or technical support, but technology may never be the aim. As instructional material ICT can motivate the pupils or it can be a channel along which information can be selected in a fast and purposeful manner. Visual material, written texts or authentical sources are within reach. Pupils can be trained in the gathering and processing of information. "It is of great importance that in history courses emphasis is not so much on information that has been acquired, but rather on the applied search-, selection- and processing strategies. (...) By questioning the information that is offered, the pupil has to come to critical analysis, interpretation, judgement, reflection, hypothesis and synthesis."[24] In view of this observation, ICT can be used for acquiring skills independently. Moreover pupils can discuss problems and results. Finally, the teacher can make use of simulations appealing to the pupil's imagination and empathic abilities.

2. Conditions in the margin

Despite these positive signals, educational circles have not yet adapted to the new trends. Most of the time the use of computers in education depends on the initiative of individual teachers. A sensitization of the entire teaching staff by setting up refresher courses, therefore seems to be a necessary aspect of an efficient policy. Apart from

that, also schoolmanagement and economical and practical considerations influence the development of an appropriate infrastructure.

Probably, also the quality of the available instructional material has got something to do with the relatively limited spread of ICT in present education. The realization of qualitative software isn't a one man's business but a matter of teamwork. Educationalists, skilled specialists, as well as computer programmers have to be involved. The available products aren't always attuned to daily educational practice. Because of time pressure, teachers aren't inclined to use expensive software. "This, combined with the fact that teachers won't easily change their teaching habits, means that experiments with this new teaching method aren't very common."[25]

3. What one should expect of educational software

"Applications of ICT are adapted to the existing teaching routines; the believes and attitudes of teachers towards their teaching practices did not change, and basically the teaching and learning process itself did not change."
(Pelgrum, Janssen Reinen & Plomp, 1993)[26]

This concern is shared by G. Kanselaar. "The hype about having access to a mass of information should not create the idea that a virtual trip through the information environment automatically results into effective learning. For that it is necessary that learning environments are created in which the learning process is recalled and interactively supported."[27] De Corte, Verschaffel and Lowyck registered some more wrong suppositions concerning computers and learning: the assumption that computers will by themselves elicit effective learning and the conception of learning as a rather passive and highly individual process of knowledge absorption and accumulation. The role of the computer in the classroom has to change "from an authoritarian and directive tutor toward a supportive system that is less structured and less directive, that encompasses student-controlled tools for the acquisition of knowledge and skills, and that attempts to integrate both tools and coaching strategies in collaborative learning environments."[28] To reach these goals one has to leave the 'aim-means thinking' and the social and profession-oriented rationale. Only then a product can be developed that goes beyond the principle of immediate utility, supporting the value of personal development.

The use of educational software can only become attractive when it carries in it a surplus value that exceeds traditional instructional material. For illustrative information or the training of standard exercises the text book doesn't have to give way to a computer screen. Blind confidence in the possibilities of computing also has to be avoided. "In most software design it is presumed desirable to make the software as intelligent as possible and to demand as little intelligence as possible from the user. Educational applications, on the other hand, should be aimed at developing the intelligence of the user."[29] What has to be stressed by observing the process of knowledge acquisition is not the final result, but the route taken by the learner to reach a solution. A computer isn't a machine to teach with, but to learn with by doing.[30]

In accordance with recent developments in history education, in which the research method and the discussion character of the discipline are of great importance, the

principles of hypertext and hypermedia create new possibilities. They permit the pupil to search her or his way through a many-sided information environment. Considering the recent social context, the ability to assimilate efficient seek-strategies seems to be of great importance for the learner. "Because of the immediate availability of large amounts of information, the simultaneous offering of already known and new information, the large storage capacity and the presentation of information in text, image and sound can support the pupil's knowledge construction and organization."[31]

IV. The Maerlant-project

1. Justification

The main idea behind the project was the make up of a corpus of sources on medieval history to permit pupils in secondary school or students in higher education to practise the historical research method. Because these groups display differences in intellectual competence, social development and domains of interest, a reformulation of the aims was necessary. Still, the starting point, the development of historical skills, remained of great importance. At present, emphasis lies on the design of a product that can be used in secondary school. This option is connected with the recent introduction of the *End targets* of secundary education and learning purposes of history education in which the research dimension is stressed.

The programme focuses on the development of historical skills rather than on historical contents. The role of the teacher remains of great importance but it will be differently orientated. His task is no longer that of a provider of information. He has to accompany the process of knowledge development of the learner. The key element in the process of education remains learning how to learn under the guidance of a teacher but the learning process evolves by means of ICT. This goal is inspired by the theory of constructivism and its influence on instructional design.[32]

Until the late 1950's behavioral laws provided the most prominent conceptions of learning. According to behaviorism, learning behaviors can be shaped by selective reinforcement. Behavioral or objectivist conceptions of instruction seek to analyze, decompose, and simplify tasks in order to make instruction and learning easier.[33] In this kind of knowledge transmission it is assumed that there is an argument on what reality is and that everybody uses essentially the same process for understanding it. "Learners are told about the world and are expected to replicate its content and structure in their thinking."[34]

S. Papert argues that "the kind of knowledge children most need is the knowledge that will help them get more knowledge"[35]. Scientists who are defenders of constructivism believe that understanding involves going beyond the presented information. Comprehension involves the construction of meaning based upon the prior knowledge of the learner.[36] Reality is more in the mind of the knower, the knower constructs a reality, or at least interprets it, based upon his or her apperceptions. "The emphasis in objectivism is on the object of our knowing, whereas constructivism is concerned with how we construct knowledge."[37]

In cognitive flexibility theory a new element of constructive processing is added: the flexible use of preexisting knowledge. Revisiting the same material at different times in different contexts for different purposes and from different conceptual perspectives is essential for advanced knowledge acquisition.[38]

A medium like hypertext would be suited for the metaphor of the criss crossed landscape (Wittgenstein, 1953), often used in the context of cognitive flexibility theory.[39] Hypertext refers to "a nonsequential, nonlinear method for organizing and displaying text that was designed to enable readers to access information from a text in ways that are meaningful to them."[40]

The principle of hypertext offers, as we already mentioned, the possibility of non-linear instruction, an educational approach that differs from the traditional text book. Multi-perspective instruction (learning contents can be related and studied in an unlimited way) and the break-through of the simultaneousness of the class occurrence (the system permits the individual pupil to decide for him or herself which strategy to use to reach a preconceived goal) transform the learning process into a personal experience. Yet this individual approach itself can in turn be broadened by offering the pupils an electronic platform to discuss their personal findings in group.

The multi-medial dimension of the Maerlant-project offers a second surplus value. The information can be offered in various ways and includes primary as well as secondary source material. Documents can be shown in their authentic state. An unlimited collection of pictures, miniatures and illustrations keep their perfect shape. What is hardly possible with videotaping, an attractive medium for many teachers, can be done by this electronic product: select fragments, insert moments of reflection, analyse stagnant pictures. Multiple channel research from the past proved that when different media channels offer complementary information learning may increase.[41]

The concrete building up of the product is based upon a theoretical analytical scheme to which the source material and the processing methods can be compared. Emphasis is laid upon historical contents (the reality of the past), historical methods (the investigation of the past), representation of the past (to give meaning) and concept development. This offers the designers the opportunity to pursue a maximal variety of sources and study targets.

Analytical scheme[42]

<u>I. Historical discipline</u>

1. Contents (content information)

> History as insightful knowledge of the past
> The story of the past reality
>
> What happened?
> = describe
>> -identification
>> -structure: dimensions time, space
>> and the social dimension
>
> How and why did it happen?
> = explain
>> -relations
>> -mechanisms
>> -processes

2. Procedures (procedural information)

> History as investigation of the past
> The validity of the story of the past
>
> Heuristics:
> -Identification of the source (type, date)
> -Original, copy, restoration, reconstruction ?
>
> Formal historical criticism
> -Who made the source, where and when?
> -Is it original?
>
> Content historical criticism
> -Interpretation (describe)
> context
> content
> language use
> -Is the author well informed?
> -Is the source believable?
>
> Synthesis:
> -Confrontation with other sources
> -historical reality, mentality
> -explain, proof, evaluate

3. Linguistic representation

Content or historical concepts
(to represent contents)
    -descriptive or declarative
    -context
    -hierarchy

Procedural or structural concepts
(representation of procedures

II. Instructional design

Goal: historical formation

Knowledge and insight:
    -Knowing
    -Understanding
    -Practise
    -Integrate

Skills:
    -Global skills
    -History skills

Attitudes:
    -Global attitudes
    -Historical consciousness

The hypermedia environment enables us to create rich, dynamic objects which express the dimensions of the matrix (or analytical scheme) in their interaction with the user. This is achieved by:
-the hypertext framework in which the texts and images are presented to the user, and which features strong navigation tools,
-consistent lay-out features that match the structural differences between documents, achieved by style-sheets,
-elaborate mark-up and tagging of the documents, in order to offer a wide range of access points.

In using the program the user learns to appreciate the value of each piece of information in relation to the components of the matrix: location in time, space and social dimensions on the one hand, descriptive, structural, contextual and interpretative properties on the other. Gradually, he/she will learn to feel the shortcomings of source-data in any of these elements as a result of an effect that we would like to call 'layer-fusion' and which should lead to the ability of making a synthesis of the total value of a piece of information for the historical story. It is clear from this that we have a strong perception-rooted conception of historical method. The student acquires a perceptual attitude towards source documents, enforcing his

capabilities to detect historically relevant issues to be exploited further in a methodological way.

2. State of affairs

In a first, experimental phase, two sources, a visual and a written one, are worked out. The approach is attuned to the specific features of each source and can later on be adapted to other material. This approach is based on the idea that the critical analysis of a document doesn't have to be reduced to the systematic application of a series of standard questions. One has to let the document speak for itself so that it becomes clear that every source has its strenghts and limitations when used within a specific investigation.

A pupil can inquire the material offered on different levels. In a first, explorational phase, the learner has to understand the explicit content of the source as written in the document. On the following levels the historical context can be discovered and the interpretation of the source developed. The pupils can hereby make use of a few specific tools. At each level of the investigation, the programme permits them, to return to the information on lower levels. A search function simplifies looking up specific information and an index makes it easier the control the route taken. Next to this individual approach, pupils can consult with eachother or with the teacher who can exercise a guiding and evaluative role.

In a second phase a problem-oriented approach is intended. The learner has to confront different sources (primary and secondary sources are arranged by the standards of typology and multi-perspectivity) with eachother to develop a critical view on a specific historical topic. The inquiry will basically correspond with the one concerning the individual source, but the learner has to formulate a personal synthesis which follows out of the investigation. The confrontation between sources out of the past and representations in the present forms a crucial part of this concluding insights.

The intended programme could be compared with an electronic textbook, rather than with a complete software application. The benefits in comparison with a traditional textbook are that the research materials can be offered in large quantities and in a layered manner, and that they can be interwoven with eachother. The levels behind the reading permit to systematically narrow the gap between the source, the historical reality behind the source and the foreknowledge of the pupils. The layers result from the analytical scheme. The refinement of the scheme has to permit the pupil to improve his/her perception. The skills the learner can develop are easily transferable to other domains because the development of an accurate conceptual background and reading attitude are fundamental in every form of knowledge acquisition. An efficient instructional programme offers unknown possibilities for the practice of historical skills in a personalized manner. The learner can explore his already attained competences and add to it new accomplishments on his/her own tempo and abilities.

V. Concluding remarks

We tried to trace out the basic ideas behind the product we are developing within the scope of the *Maerlant-project*. We believe that the new environmental conditions of present-day information society create extraordinary opportunities for history instruction. In the educational field the consensus on the need for a critical and skills-

oriented (without denying the importance of mastering historical contents) way of teaching seems to be growing. The methods and concepts of the historical discipline are well suited for the acquisition of a funded attitude of learning and thinking about one's own place in society.

This society asks for people who can find their way through a world that has become small, but huge as well, thanks (or despite, as some people may say) to information- and communication,technology. To convince the 'non-believers' it seems to be of great importance to stress the advantages and possibilities of new technologies apart from a blind confidence in what's new but not necessary better than the things we're used to. We don't believe that the machine will drive the teacher out of his classroom, but you can't drive around the world without a car (or any other machine) either. It still makes the world a bit larger and more fascinating place to be. What has to be stressed is the importance of a sound environment to succesfully implement computer applications in the classroom.

The principles behind hypertext and hypermedia can give the class occurrence a not fundamentally different content, but it can broaden the instructional possibilities. And it can be a motivating element for pupils who feel that their school environment defines its place in global social developments. As defenders of the constructivist view on instruction, we believe that it is of great importance to provide pupils with the tools needed for life-long learning. They have to construct their own knowledge basis and are therefore entrusted with a much more responsible task than pupils of whom the teacher was an all-knowing master.

Demo : http://fuzzy.arts.kuleuven.ac.be/maerlant
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Summary

The rapidly changing present-day information society creates new needs and opportunities for the history teacher. He can help young people to develop the skills necessary for life-long learning. The heuristic methods and the critical analyses of texts (written texts but also images, moving pictures etc.) characteristic for the historical discipline are easy transferable to other domains of knowledge acquisition.

The use of information and communication technology in history instruction can help to reach the former aim. The principles of hypertext and hypermedia permit the learner (in the spirit of constructivism) to decide for him- or herself which strategy to use to reach a preconceived goal. The role of the teacher changes from that of a provider of information into that of a guide during the pupils learning process.

In the following article you can read about the instructional principles, the technological design and the first results of the Maerlant-project, a project in which the researchers try to reconcile history teaching, history as a scientific discipline and ICT.

[1] This article is based upon a lecture given at the congress of Euroclio in Helsinki (1998-03-12). The project is designed by the following team: R. De Keyser, F. Truyen, J. Lowyck, L. Vanmaele, P. Trio, W. Verbeke, R. Bauer, L. Meuris, L. Lamberts, K. Rogiers, J. van Leeuwen and W. Dupon. It is sponsored by the Catholic University of Leuven.

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