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ABSTRACT

Confronted with the pressure of a rapidly changing environment, organizations demand new skills and capabilities of future managers. These demands and the findings of learning theory necessitate a corresponding change in education of tomorrow's managers. Future management education requires a balance between the imparting of knowledge to the learner and the learner's own construction of it. This paper describes how the foundation for such future management education can be laid by collaborative learning environments. The framework, implementation, and experiences in team-oriented learning and knowledge creation via collaborative learning environments are described, based on the Genius (Groupware Enabled Learning Environment for Education in Management) research program at the University of St. Gallen (Switzerland). Starting with an overview of Genius projects, the "Technology-Enabled Learning and Knowledge Creation" course is used as an example of how the Genius framework is put into effect on the CEMS (Community of European Management Schools) Genius platform. The learning infrastructure, consisting of distributive, interactive, and collaborative learning technologies, is described. Directed, self-directed, and collaborative learning strategies are summarized. Two figures present the CEMS Genius learning infrastructure and a chart of learning strategies. (Author/MES)

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# COLLABORATIVE LEARNING ENVIRONMENTS FOR MANAGEMENT EDUCATION

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*Confronted with the pressure of a rapidly changing environment, organizations demand new skills and capabilities of future managers. These demands on one hand, and the findings of Learning-theory on the other hand, necessitate a corresponding change in education of tomorrows managers. Future management education needs a balance between the imparting of knowledge to the learner, and the learner's own construction of it. In the following, we describe how the foundation for such a future Management Education can be laid, by what we call Collaborative Learning Environments. Therefore we describe the framework, implementation and experiences in team-oriented learning and knowledge creation via Collaborative Learning Environments, based on our research program Genius (Groupware enabled Learning Environment for Education in Management at the University of St. Gallen). Starting with an overview of the Genius Projects we use the course "Technology-enabled learning and knowledge creation" as an example of how the Genius Framework is put into effect on the CEMS Genius Platform.*

## INTRODUCTION AND MOTIVATION

### New Skills and Capabilities Required for Future Managers

Confronted with the pressure of a rapidly changing environment, organizations demand new skills and capabilities for future managers. Research has shown that managers of the future will require a more intensive mix of skills and competencies than their predecessors<sup>1</sup>. According to *Hiltrop*, future managers have to show mastery of four key competencies. Managers will need to engage in continuous learning and self-development. Their challenge is to keep pace with the change and to adapt to the evolving needs of the organization. Future managers will increasingly find themselves, either directly or indirectly, interacting with other functions, cultures and professionals. Therefore they have to be Networkers, i. e. every manager will need to be able to collaborate effectively with a wide diversity of experts and multi-disciplinary groups of people<sup>2</sup>. Future careers will not be well specified and secure<sup>3</sup>. Thus future managers must be

self-reliant and take responsibility for their careers and income. In addition to other skills, they will need the ability to live with high levels of uncertainty, and bounce back quickly from failure and disappointment. In other words, the future manager has to become resilient. That is to say he/she has to be highly initiative, willing to take risks, and persistent even in the face of adversity<sup>4</sup>.

### Need for a Paradigm Shift in Management Education

A widespread weakness of Management Education today is, that a large amount of knowledge is imparted additionally, i.e., without any attempt being made to interlink them by means of questions arising from the reality of daily business practice. Such knowledge remains in many cases knowledge which has not been truly understood, because it has been merely learnt by rote and therefore cannot be consciously disposed of, or summoned up to help its possessor to deal with concrete situations. A suggestion frequently made is that the quantity of material to be learnt should be reduced to a minimum, and that the lesson-time so gained may be devoted to the cultivation of

such qualities as problem-solving, decision-making, creativity, etc. Such an approach is justified with the claim that a high percentage of the knowledge acquired will in any case become obsolete, and it is therefore useless to accumulate much of it. From the vantage-point of Cognitive Psychology, such statements must be judged erroneous. The disposability of knowledge remains the chief prerequisite for all learning. What is decisive, however, is that knowledge should be worked for, that is to say, the thought-processes associated with knowledge-acquisition should be made visible in realistic situations<sup>5</sup>. In this context, there is no need to place all information at the learner's disposal. What is necessary is formative, "opening-up" knowledge which enables the learner to apply knowledge creatively, and which gives her/him the opportunity to create new knowledge<sup>6</sup>.

An other widespread weakness of Management Education today lies in its too one-sided alignment to concrete learning-results (Product-orientated Learning), and in its neglect of Process-orientated Learning. Learning, and above all the transfer of what has been learnt to other situations, could be much more successful if Process-orientated Learning were introduced into Management Education. The term "Process-orientated Learning" means making learning- and thought-processes visible, so that students systematically acquire learning-strategies, i.e., the procedures and courses to be adopted when learning, or, respectively, thinking-strategies and -processes. As learning- and thinking-strategies are tied to one subject, however, they cannot be acquired in a universally applicable form by the study of any other<sup>7</sup>. For this reason, lessons must be planned in such a way that learners not only succeed in attaining the learning-objective, but realize how they did so. What is crucial thereby is that metacognition, i.e., the learners' knowledge of their own learning and their ability to guide it, is developed. Good metacognition leads to better learning-performance and reinforces one's own self-concept (the ability to exploit one's own powers and recognize one's limitations)<sup>8</sup>.

### **Genius – Collaborative Learning Environments for Advanced Management Education**

The findings of Learning-theory on the one hand, and the demands made on future Management Education on the other, imply the need for a balance between the imparting of knowledge to the learner, and the learner's own construction of it. These changing environments necessitate a corresponding change in education of tomorrow's managers by what we call *Collaborative Learning Environments*. For the purpose of this paper

*Collaborative Learning Environments* may be defined as

learning communities combining the potentialities of modern Information and Communication Technologies (ICT) with advanced methodological-didactic concepts in order to improve learning and knowledge creation.

In the following, we describe how the foundations for such a future Management Education can be laid. Therefore we discuss the experiences of the Genius Projects at the university of St. Gallen. Starting with an overview of the Genius Projects we use the course "Technology-enabled learning and knowledge creation" as an example of how the *Genius Framework* is put into effect on the *CEMS Genius Platform*.

### **Overview Genius Projects**

*Genius* has hitherto been put into effect in three research projects, each with its own emphasis. In the following, a synopsis of these projects will be briefly presented, before, finally, the way it is put into effect is illustrated with the example of Project *CEMS Genius*. *MBE Genius* is a learning environment employed in the Executive Study Program "Master of Business Engineering" (MBE). The objective of this program is the education of change managers. The learning network is made up of a team of lecturers and MBE course-members, most of whom are graduates in Business administration from medium-sized and large companies. The course takes places in several blocks, most of them requiring the students physical presence. During and between the course-blocks, *MBE Genius* functions as an information and communication platform, by means of which the participants can prepare for the next group of themes. *MBL'Genius* is the learning environment for the Executive Study Program "Master of European and International Business Law". In this case, the learning network comprises a team of lecturers made up of specialists from all over the world, and MBL course-members, who are often lawyers with private practices. As temporal and geographical independence are of high importance to such people. The question of the allocation of learning-scenarios is one of great consequence. MBL course-members must, for example, work on complex cases and give expert opinions. For this purpose, course-members have a "library" at their disposal, filled with legal texts, decrees, regulations and other legal documents, which is constantly updated. The learning environment of *CEMS Genius* forms a inter-university network. CEMS stands for "Community of European Management Schools". To this network belong

some of the most reputable European Universities, and, as corporate partners, some of the most important European corporations. Academics can work together through the medium of Groupware-based learning-environment *CEMS Genius* to offer classes, lectures, etc., to cooperate in remote teams, and to set international teams of students to work upon case-studies independently of time and place. During such courses, students have the opportunity to improve their media and methodological skills in working in dispersed teams – mode of work they will have to accustom themselves to in their future professions. Besides this, prominence is given to learning-processes that introduce the various ways of working of different nations in Europe. CEMS Corporate Partners can more easily be drawn in by means of *CEMS Genius* in order to deliver projects or cases, and to be able to function as "consultative observers".

### CEMS Genius – An Inter-University Learning Network

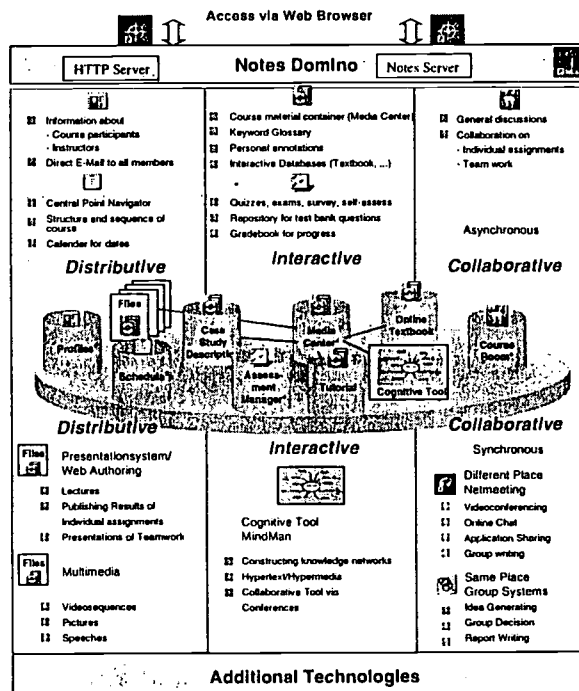
This virtual online course was conducted in the summer term of 1998 in cooperation with the universities of Bocconi (Italy), Cologne (Germany) and Vienna (Austria). 18 students from St. Gallen, 13 of them members of the CEMS Study Program, and 5 MBA students from Universities of Minnesota, USA. 4 students from Bocconi, 6 from Cologne and 5 from Vienna also

participated. Based on the *Genius* Framework, we will now outline the learning infrastructure used within the framework of this course to put the technological approach into effect, and the learning strategies to do the same for the didactic approach.

**Learning Infrastructure.** The infrastructural basis consists of a Domino 4.6 Web Server which apart from Internet access to the underlying Lotus Notes databases, also allows a representation of native WWW formats (HTML, JPEG, Java, etc.).

The Lotus standard software LearningSpace, forms the nucleus of the *CEMS Genius* platform. It was adapted and supplemented with our own Lotus Notes applications as well as with the integration of complementary technologies. Apart from the integration of selected distributive and interactive tools, the extensions concern above all the field of collaborative tools. As the Domino Server in the 4.6 version available permits only the support of asynchronous communications, synchronous communication takes place over Microsoft's software Netmeeting. For assistance with group-decisions, one can additionally fall back upon the meeting support software GroupSystems. Figure 1 gives an overview of the *CEMS Genius* learning infrastructure.

FIGURE 1  
CEMS GENIUS LEARNING INFRASTRUCTURE



\* Component from Lotus LearningSpace 2.5

**Distributive Learning Technologies.** Within the field of distributive learning-technologies, apart from supplementary tools used to set up Web Presentation and Multimedia Sequences, one can differentiate principally between the profile database and the database for the description of the case studies. The schedule database serves as central navigator. With its aid, the learner can obtain an overview of the course-structure. To this end, the learner can form an opinion on course modules, activities and teaching-personalities. Calendar-functions provide additional orientation. The profiles database collects information on the professional background and personal interests of both the course-members and teaching-personnel. Course-members can thus gain an impression of their fellow-participants, the lecturers, and the guest-speakers. Direct communication via e-mail is also possible. The case-study database contains the introductory information necessary for work on case-studies. Besides basic facts and complementary background material, it includes the team-assignment.

**Interactive Learning Technologies.** The media center database contains course-materials, lectures, presentations, articles, etc. which may include multimedia data-formats of any description. Apart from this, indications to external sources of information such as WWW links, or links to other Notes databases, can be laid down. As a central repository, it thus points the way to all necessary information and documents. The provision of course-materials such as presentations prepared by guest-speakers or key concepts facilitates the course-members search. As a thematically overlapping script, the Online Textbook is prepared in an electronic version as well as in paper form. This allows of the inclusion of search functions, the integration of hypertext- or media-elements, and the opportunity to record personal notes one has made. Complementary to this, the Tutorial database contains thematically structured task-settings as exercises on and reinforcement of what has been learnt. MindMan is a cognitive tool for graphic visualization and the production of Mind Maps. With the aid of this software, students can work out and structure complex contexts. The assessment manager database is an instrument intended specially for lecturers' development, evaluation or registration of tests. Students have no access to it. The tests can be given to them as quizzes, for self-assessment, or as a final examination.

**Collaborative Learning Technologies.** Collaborative Learning Technologies offer tools for synchronous and asynchronous communication. The database Course Room represents the asynchronous component. General themes can be discussed there, assignments worked on,

information asynchronously shared, and ideas developed. At the same time, one can make contributions public, for oneself or one's team only, or for the lecturers eyes only. For synchronous communication the students have at their disposal on the one hand: Microsoft's Software Netmeeting, for Real Time Chat linked to Videoconferencing, Screen and Application Sharing and group-writing via whiteboards. On the other hand, students can use the Software GroupSystems for problem-solving, which supports the generation of ideas in particular as well as the evaluation of those already formulated.

### Learning Strategies

"Learning Strategies" is a term for the general method of procedure for the achievement of learning-objectives. They are made up of learning-methods and learning-situations, as well as the roles of teacher and learner. During the course, the learning-strategies Directed, Self-directed and Collaborative Learning are employed to impart knowledge.

**FIGURE 2  
LEARNING STRATEGIES**

Learning Strategies	Directed Learning	Self-directed Learning	Collaborative Learning
Learning Strategies	„Learning by telling“	„Learning by doing“	„Learning through reflection and discussion“
Learning Methods	Instructor centered	Learner centered	Team centered
Learning Scenarios	Simple All Information given	More Complex Within the Information given	Complex, Realistic Beyond the Information given
Instructor Role	Direct Leadership	Facilitator, Coaching	Coaching, Moderator
Learner Role	Passive	Active	Active, Reflective

**Directed Learning.** On the grounds of the authors' expressed opinion that knowledge comes into being in the last resort as the individual's own creation, instructor-centered methods are used very sparingly and mainly for the introduction of new thematic complexes. Course-members can help themselves in this respect by taking advantage of the introduction database to case studies as mentioned above, and the presentations prepared by both lecturers and guest-speakers from companies.

**Self-Directed Learning.** This is very chiefly for the acquisition of the software skills necessary for the course. For this purpose, tutorials contain directions for setting tasks, introducing the participant step by step to different modules. Introductory and monitoring questions make the connection to the material previously dealt with in the Online Textbook. Depending upon the student's stage of progress, she/he can decide what material to repeat and reinforce if necessary. Various sorting functions help the student when working on the theme-complex. For the support of self-directed learning, the learner's attention is also drawn to sources of further information, individual tasks are assigned for the working-out of some detailed theme-complexes. The self-directed learning approach receives particularly strong support from the so-called Self-assessments. These contain questions tailored to various knowledge-fields of the course, which help students to judge of their own progress. For this reason, students can look up the answers to their questions in the system.

**Collaborative Learning.** Besides Directed and Self-Directed Learning, the emphasis in CEMS Genius is above all on Collaborative Learning. This strategy is used intensively both when students are physically present at classes and for distance learning on case-studies. In the frame of real-presence learning, after a brief introduction students are given short team-assignments by the lecturer, which they are expected to deal with successfully within three quarters of an hour. To prepare their solutions, students have at their disposal the Groupware laboratory of the Institute, which they can use to conduct research on the internet, to make group-decisions (GroupSystems), and to prepare presentations (Powerpoint, Freelance). Of great importance to success in learning is the already mentioned critical reflection within the group. For this purpose, students must present their solution to the whole class and be prepared to defend it in a discussion. The collaborative Learning strategy undergoes further development in the field of the case-studies carried out. They serve to foster the ability to act and make decisions on the part of the course-participants. They are therefore made up of the two elements collaboration and competition. On the one hand, supranational teams are formed (one such may contain students from Cologne, Vienna, Bocconi and St. Gallen), each of which seeks to find a common solution, whereas on the other hand the teams compete with each other to achieve the best result. The individual group-tasks are not only evaluated but also discussed at a meeting on the groups' experiences while accomplishing their tasks. Apart from this, the participants with voting-powers can award each other marks for the quality of the final presentation in the Course Room of CEMS Genius. In this

way, the course-members are induced to reflect upon their own contribution and performance, thus reinforcing their metacognition of the learning process.

## CONCLUSION AND FUTURE RESEARCH

In the interplay with the learning-material, it is no longer teachers but the learners upon whom attention is focused. This implies the need for self-directed learning proceeding from a whole-hearted, not step-by-step, approach to problems, a stronger emphasis on process-oriented instead of product-oriented teaching, and work in teams. It also appears to be essential to success that the teacher manages to create a good learning-climate that allows the class to become a learning-community. This is characterized by group-dialogues, work in groups and as individuals, with the aim of constructing knowledge, not merely receiving it, as this encourages the learners to understand for themselves, not just learn by hearsay. This kind of teaching makes former instructors into learning-advisors. What is more, this approach provides good opportunities for practice in teamwork, which is becoming of ever greater significance in business practice.

If based on a corresponding didactic design, modern information- and communication-technology can be of decisive help here. But it is just in this respect that there is in the authors' opinion, a great deal of lost ground to be recovered for future-oriented Management Education. For example, before the beginning of the first case-study, the teams were advised of the great advantage of using synchronous communications technology to solve it; it subsequently turned out that only three out of six teams had done so. One may add that even the teams which had made intensive use of synchronous communication-forms had used asynchronous media, such as the Discussion Forum, much more frequently. The observation was made that teams with a high degree of interaction produced more comprehensive and creative approaches to solutions in their work on cases.

To sum up: good-cognitive teaching produces good learning results and is well received by learners, but is extraordinarily demanding, and time- and energy-consuming in its preparation. This entails the danger that teachers who do not receive enough guidance on and demonstrations of this form of teaching may remain sceptical towards it. In the authors' opinion, this would be fatal to the prospects of future Management Education of a high standard. For that reason besides the support of learners, a similar support of teachers seems to us essential to the success of cognitive teaching. The results of these reflections will therefore be integrated into a further development of Genius Framework.

## ENDNOTES

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