Learning is making sense of the world.
Teaching is helping someone to learn.
(Tom Duffy, 2001).

Paper presented at: 8th Annual Edineb International Conference
' Technology, pedagogy and innovation'
At EDHEC School of Management, Nice, France
June 20 - 22, 2001

PDF-version, prepared on the 11th of July 2012

New media and the role of teachers
A report on new practices at the Johan Cruyff University

Fons Vernooij (1) and Thomas Thijssen (2)

ABSTRACT

New media and the role of teachers

A report on new practices at the Johan Cruyff University

The Johan Cruyff University is founded at Johan Cruyff's instigation to offer elite athletes an opportunity to combine a career in sport with an education in commercial economics. Once these players finish their career, they are able to accept leading jobs either in marketing departments of companies involved in sponsoring, or in sport organizations involved in organizing large sport-events.

The students live all over Holland and participate in training and sport events all over the world. In order to support the study of those students, new media are introduced to overcome the problems of time and space. But not only the opportunities of the world wide web are explored to create new learning and testing arrangements, the role of the teachers is adapted to the new reality as well.

The first characteristic of the curriculum (*) is the formulation of learning outcomes in terms of competencies. These are understood as a combination of knowledge, skills and behaviour. A set of competencies is defined by the staff,

but the students must formulate their desired learning outcomes every block.

At the end of every term of 10 weeks, students demonstrate their competencies in different ways. They participate in assessments and they develop their own web site to present their assignments and their reports. This web site contains a portfolio, accessible for teachers and (partly) for their fellow students.

The second characteristic is the splitting up of the function of the teacher in different roles performed by different persons. Well stated roles are the navigator, the trainer, the instructor, the consultant and the assessor. They focus respectively on coaching, skill training, knowledge transfer, consulting and judging the students development.

The navigator and the assessor have a permanent relation to the student, in order to support a continuing growth in competencies. Every ten weeks the assessor discusses the development of the students competencies referring to the students list of personal learning outcomes.

The third characteristic is the use of internet to contact fellow students and consultants. To activate the students while they are busy with their sports, special projects are started, like playing a management game, such as Trade Company. Students operate as a team and take decisions, whilst they overcome the problems of time and space using the communication facilities of Internet.

Problems they cannot solve themselves, they can present to a consultant with e-mail. The consultant reacts not only to the students but builds up a list of frequently asked questions in order to help other students who run in the same problem. This way e-mail and internet are complementary to each other.

(*) The concept for the JCU was developed by Jos Baeten, Citowoz on request of the board of directors of the Hogeschool van Amsterdam. The same concept as for the JCU is applied to other departments of the Institute of Management and Economics. It is just that the need for distance learning makes the concept more explicit for the students of the JCU.

New media and the role of teachers

A report on new practices at the Johan Cruyff University

Fons Vernooij (1) and Thomas Thijssen (2)

The Johan Cruyff University

The Johan Cruyff University (JCU) is established in August 2000 at the Hogeschool of Amsterdam. It is part of the Institute of Management and Economics and is shaped after the curriculum of commercial economics. The concept for the JCU was developed by Jos Baeten, Citowoz on request of the board of directors of the Hogeschool van Amsterdam.

The idea for this special department came from Johan Cruyff who proposed to offer elite athletes an opportunity to combine a career in sport with an education in commercial economics. Once these athletes finish their career, they are able to accept leading jobs either in marketing departments of companies involved in sponsoring, or in sport organizations

Elite athletes from all sports are currently studying at the JCU. As Johan Cruyff pointed out, athletes who want to reach the top, must have drive, discipline and faith in their own abilities. The same qualities are required to successfully complete the challenging program in business economics offered by the JCU. To be sure the right students enroll, the JCU intake selection is very tough. Candidates must perform on the highest level of their sport's association.

By attending the JCU, elite athletes can continue their sports career while completing a four year course in vocational education. The result is a bachelor's degree in business studies. This is the best possible preparation for a management career in sports. With their sports background and their passionate and disciplined character as an elite competitor, JCU graduates will enjoy preference in job recruiting.

Potential employers are sporting clubs, sporting associations, sports-related companies, and companies that spent much money in sponsoring teams or events. Besides government agencies and non-profit organizations involved in sport can benefit from capable economists with a sports career.

The students live all over Holland and participate in training and sport events all over the world. In order to support the study of those students, new media like the world wide web are introduced to overcome the problems of time and space. Study schedules are tailored to fit in with the training schedules and matches of individual athletes. Even examinations are planned in accordance with the sports career.

But not only the opportunities of the world wide web are explored to create new learning and testing arrangements. The JCU-intranet system offers many opportunities to support the regulation of the learning processes. On this site, special attention is given to supporting different kinds of learning processes like: the transfer of knowledge, the discussion in groups, the care for ongoing motivation and the support for the planning processes.

New roles for teachers

To construct a curriculum that fits elite athletes, an innovative approach is chosen. This approach is tailored to new developments in education. The first development is the growing importance of competency based learning. To prepare students of the JCU for their future work as economists, competency based learning was taken as the foundation of the curriculum (Parry, 1996).

The second development is the incorporation of ICT, where useful (Vernooij, Thijssen & Schermerhorn, 2001). Each of those developments led to new roles for teachers.

Competency-based learning

There are many definitions of competencies, either derived from job requirements or from individual capacities (Stoof, Martens & Merrieënboer, 2001). In all cases they combine knowledge, skills and attitudes. Knowledge is the traditional trademark of universities. But the shift in knowledge from 'just in case' to 'just in time' redirects the learning material from facts and concepts towards problem solving.

This paradigm shift in learning and instruction, causes attention for different kinds of skills: social skills, ICT skills and learning skills. To develop competencies, attention must be given as well to attitudes, like motivation, attribution, and self-assessment. In fact, students must develop a *monitoring* process to integrate knowledge, skills and attitudes.

To meet the quest for competencies (Parry, 1996) the curriculum of the JCU is based upon real-life experiences, supported by lectures, meetings, presentations, and assessments at school. One of the principles at stake is 'learning by sharing': students teachers and professionals work together and join in research activities (Thijssen, Maes & Vernooij, 2001).

The first year, students of the JCU prepare business cases about organizations or companies they have relations with, either by sports connections or by family. The second year, students are confronted with real economic problems, put forward by organizations or companies. They operate as virtual consulting firm and try to find a solution to those problems. Then they present the solution in the office of the organization or the company involved.

The third year, students of the JCU will work for 600 hours in a company or organization of their choice. They will work on special tasks which are both productive and informative. The fourth year, the students will have to tackle a complex problem and write a thesis about the way they would solve it. Again, the final presentation will be in the office of the company or organization that has put forward the problem.

The support of activities, derived from competency based learning, has led to the distinction of three roles:
- the ***instructor***, who transfers knowledge in lectures and meetings
- the ***trainer***, who develops skills in training sessions
- the ***navigator*****,** who shapes attitudes in small supervision groups.

The role of navigator is like the role of a tutor or coach as this role is introduced to support the learning skills and the development of attitudes, necessary in profession and study.

A second influence of competency learning leads to the elaboration of a new teacher role. Competency learning distinguishes testing from judging. Separate parts of the program can be tested by the instructor or the trainer. But competency learning requires an over-all view on the integration of knowledge, skills and attitudes. At the JCU, this judging has led to the role of ***assessor*****.** This role is shaped on the competency of judging students on the development of their professional competencies.

The introduction of new media

The second influence on the reshaping of teacher's roles at the JCU is the introduction of new media in education. Developments in ICT offer new opportunities for students to gather information via the world wide web. E-mail offers the opportunity to contact a teacher and put questions forward. Discussion boards and chat-facilities create new ways of communication.

Not all functionalities are instant successes as learning facilities, but they offer opportunities to reshape the learning processes (Vernooij, Thijssen & Schermerhorn, 2001).

The introduction of these new media have led to some new roles in education as well. One of them coincides with the support of learning processes and attitudes. The role of *navigator* encloses the activity of supporting the students to use information and communication technology.

The specific training of ICT-skills is part of the role of the trainer, but the application of ICT-skills in different learning processes, is part of the role of the navigator. This explains why the name 'tutor' is omitted. Because the role of advising how to surf on the internet is included, the role of navigator is broader than the role of tutor and therefore the name 'navigator' is chosen.

The second role that emerges as soon as ICT is introduced, is the role of *consultant*. Via e-mail and discussion groups new ways of communication are opened. At the JCU the functionality was created of consulting instructors or outside professionals, free of hindrances in time and space. However new rules were developed to avoid unrealistic expectations of students about the time-span in which a reaction was give.

At the same time the role of *instructor* was continued, but reshaped from the moment ICT was introduced. On the one hand traditional lectures changed, as soon as new media, like PowerPoint, were introduced in class (Rotfield, 2000). On the other hand, organizational information was lifted out of the class and centered in the JCU-intranet.

The spreading out of roles over teachers

Right from the start of the program in August 2000, attempts were made to spread the teacher's roles out over different people. Sometimes roles are taken together for logistic reasons, but clarity is sought for by explicitly presenting different roles in different people. An important reason for this division of roles, is the incorporation of required competencies for performing the roles.

The *navigator* must be a specialist in learning skills and in the shaping of attitudes. At the same time the navigator must be able to explore the new opportunities put forward by the new media and support students to incorporate these new media in their learning.

The *trainer* is a skills specialist, either in ICT or social skills. Neither of these two roles require much knowledge of economics. Of course some knowledge is attractive in order to understand the context in which the students are working and learning, but navigators and trainers don't have to be a content specialist.

The specialists in economic concepts and procedures are the *instructor* and the *consultant*. They may have short contacts with the JCU-students, as every term takes only 10 weeks. Each term other instructors and consultants are to be employed in the curriculum.

For instructors and consultants, skills and attitudes are part of the context in which their knowledge makes sense. But they don't have to be specialists in skills or attitudes themselves. So, they are important in transferring and testing the economic knowledge of the students and they work together with trainers when papers and presentations are used for testing.

The *assessor* has the most important role at the JCU. He or she is a judgement specialist and has, for that reason, a permanent relation with the students, in order to judge the continuing growth in competencies (in this case 'permanent'

means at least a year).

The intriguing part of this role is, that it is not necessarily required to be a content specialist to be able to judge. As long as information about test results is provided by trainers and content specialists an assessor can take decisions about the study progress of the students. Moreover, the assessor can supplement its information by assessments where students show their competencies.

In fact, the JCU has some assessors who are not at all economists but are competent in judging by combining test results and assessment sessions. This way a revolution has taken place as the ultimate consequence of the introduction of competency based learning. The decision about success or failure in a study in economics is taken by someone who is not an economist.

And as the JCU is part of the Institute of Management and Economics, which offers more economics programs to full time students, the same judgement procedure holds true for all the students in the regular program as well.

The educational structure of the JCU

In traditional learning the assumption exists that education is essentially the transfer of knowledge from an external source to the learner. This opinion is increasingly under pressure. Recent theories state that learning is not a passive 'absorption' process of knowledge but an active, constructive and self-regulated process of the learner (Bednar et al. 1991)

To bring about this construction of knowledge, students need skills to guide this process or in other words: 'they need to learn how to learn' (Boekaerts and Simons, 1993; Boekaerts, 1997). The emphasis on the importance of constructing knowledge resulted in the constructivist theory (Roelofs & Terwel, 1997).

For that reason, the most essential premise of the JCU is the responsibility of the students for their own learning. All students formulate each term their desired learning outcomes. The first week of a term is reserved for orientation with the help of internet, intranet and written material. Then the students submit their desired learning outcomes to their assessor.

The assessor checks the learning outcomes with the competencies of the term and on the previous record of the student. Then student and assessor negotiate the learning outcomes to be attained.

Every year a certain professional role is chosen as curriculum organizer: the first year the role of *administrator*, the second the role of *planner*, the third year the role of *advisor* and the fourth year the role of *manager*.

For each of the four terms of a year a role is elaborated in specific professions. Then, the instructors and assessors define a set of competencies for each profession and relate them to concrete examples in the outside world. This may be the profession of sales agent, or financial assistant.

At the end of every term, students demonstrate they have attained the learning outcomes they have formulated. Or at least they are asked to give evidence. Different tests are presented and presentations are asked for. Students participate in assessments and present their assignments and reports on their own web site. This site contains a portfolio, accessible for teachers and (partly) for their fellow students.

The development of competencies is an ongoing process, which is not the case when passing an exam. Once the result of an exam is positive, the field of that exam is closed and continuous growth is not at stake. Competency development is different. At the one hand the results of a certain period are found, but on the other hand information is found to formulate input for next term (s). This is the basis for life-long-learning.

The task of the assessor is to follow the competency development. This is a tough job, because somehow a transformation must be made from tests per study method (be it a lecture, paper of skill performance) towards learning outcomes on the list of the student. In fact there exists a matrix. The learning outcomes are on one dimension and the study methods are on second dimension. Testing is along study methods, while judgement is along learning outcomes. So an important transformation must be made.

Once the assessor has checked the learning outcomes a discussion takes place with the student. Normally the tests are in week 7 of every term. Special assessment sessions and the discussion are in week 8. The assessor discusses the development of the student's competencies referring to the student's list of learning outcomes. In this discussion the assessor tells the student whether all the learning outcomes have been attained or not.

If so, the student receives the rewarding for the efforts done. In the Dutch system students get 1 point for every week of work accomplished. As an academic year exists of 40 weeks work a student must acquire 40 study points a year. This implies 10 study points per term.

As the aim of the program is that students show they heave attained the learning outcomes, covering the competencies of the term, the reward for a good performance is 10 study points. No further qualification (in terms of grades) is given

If a student does not prove that the desired learning outcomes have been attained, two possibilities are left. Either, the assessor makes a deal that certain

competencies will be added to the learning outcomes of next term, or the student is declined and must make a new attempt to prove his or her competences. If the first is the case, the student receives 10 study points. If the second is the case, the student receives 0 study points.

To conquer the points as yet, the student must make up a proposal for the assessor how to make up for the deficiencies. The school offers an opportunity to do so in week 9 and 10 of each term. This implies that students who have proven their qualities in week 8, receive two weeks of extra holidays.

The role of virtual learning

Distance learning is a very important facility for the elite athletes of the JCU. Especially since learning to learn has become the new paradigm in learning and instruction, new learning is focused on incorporating virtual learning where useful. Aims of new learning include the acquisition of learning, thinking and regulation skills (Ten Dam, Vernooij and Volman, 2000).

However, learning to learn is a process in itself. The stages to be distinguished in this process are: guided learning, experiential learning and action learning (Simons, Van der Linden and Duffy, 2000).

Thanks to the internet system, students can log in worldwide on the JCU-intranet. This site supports different kinds of learning processes (Vermunt, 1992):
- cognitive processes, aimed at knowledge transformation;
- communicative processes, aimed at developing skills;
- affective processes, aimed at improving personal qualities and motivation;
- regulatory processes, aimed at planning and monitoring the integration of the various components of the competencies.

Support of cognitive learning processes

Cognitive learning processes are mental activities that lead to knowledge. Students build up mental models (Norman, 1983) of the economic theories they are confronted with (Vernooij, 1996 and 2000). Sometimes skills are included in the concept 'çognitive learning', but in this contribution skills are kept separate and considered as communicative learning processes.

Once virtual learning is at stake, most people expect cognitive processes are the first to be supported in virtual ways. But the best way of studying free in space and time, is reading a book. To take decisions on the use of ICT, the most important question is whether things are possible, that are impossible without ICT.

To use technology to support cognitive processes, special functionalities of the new media must be incorporated. One of these functionalities is the

presentation of current affairs. Internet has the potential power of offering hot news and recent information. This means that some of the pages at the JCU-intranet contain links to useful information concerning the profession of the term.

Another innovation in education is the publication of PowerPoint presentations on the intranet. At first these presentations were a way of supporting lectures, but for students who cannot follow classes, the PowerPoint presentations are the most accurate support. This means, however, that these presentations start to live their own life. After downloading the file, it must be possible to make sense out of the presentation for people who were not present.

A special functionality of the internet is electronic communication. This implies two ways of cognitive support: e-mail and intranet. Students are offered the opportunity to put their questions by a-mail to a consultant, who is a content specialist.

To avoid an overload of e-mails (a disfunctionality of e-mail), students must contact their peer-group first to try to solve the problems together. If this does not lead to a solution, the question can be put forward to a consultant. Within time limits the consultant answers by e-mail within a certain span of time.

This time-span, needed to answer questions, is a second disfunctionality of e-mail. To overcome this hurdle, the consultant not only reacts to the students but builds up a list of frequently asked questions (FAQ). If the consultant expects more students will run into the same problems, the question will be added to a FAQ on the personal web site. This way, e-mail and internet are made complementary to each other.

Support of communicative learning processes

Communicative learning processes are about social skills (oral and written) and ICT skills which allow people to communicate in a professional way.

Virtual support offers many opportunities for communicative learning processes. The web site of the JCU contains all kinds of information about the study program. Using internet and intranet are therefor basic skills. Before enrollment, students are informed of the necessity to possess a computer and internet connection. When going abroad, students can borrow a lap top to stay on-line.

Next to the possession of a computer, is the use of. The development of ICT skills is of course strongly supported by virtual programs. But students have developed their own homepage as well. They use it as their personal site with three parts:

- a workspace, with limited access for the navigator and fellow-students,
- an assessment site with restricted assess for the navigator and the assessor,
- and a portfolio with all the work fit to show the rest of the world. Of course teachers have to develop a web site too.

In the first year of the JCU-curriculum, the work space is used for 'best practicing'. Students interview sports organizations or businesses about economic problems and place their report on their web site. Other students look at those findings and make comments. Then a next round of interviews or a fuller elaboration of the findings takes place. This way an a-synchronic instrument is used to work together.

In the second year of the curriculum, internet and intranet offer as well opportunities to tackle real organizational problems. Students, teachers and professionals share knowledge by doing research together (Thijssen, Maes & Vernooij, 2001).

Sports organizations and companies are asked to formulate problems that match the competencies of the term. Students study their literature and try to find a solution to these real problems. They present their findings to representatives of the organizations or companies involved.

Support of affective learning processes

Affective learning processes concern the emotions that occur during learning activities. They influence the self-esteem of the students. In becoming aware of the learning activities students can enhance or constrain the other learning processes by shaping expectations, by attributing success and failure (to luck or personal capacities), and by supporting their motivation for studying.

The most important way of virtual support to affective learning processes, is the web site of the JCU. To make students feel comfortable, the web site is constructed as a study adviser they can rely on. There are no written catalogues or paper sheets that contain information. Every date and every rule is on the web, either as a screen text or as a downloadable Word-document.

To activate the students while they are busy with their sports, special projects are run. One of these activities is a management game, called Trade Company (Vernooij, 1999). Students operate in teams and take decisions, whilst they overcome the problems of time and space using the communication facilities of Internet. At the end, teams present the results of their common efforts in a plenary session. Each team gives a report and is attacked by others with questions and remarks.

Another part of the curriculum, aimed at motivating students in their first year, is a vacancy project. Students must look at internet to jobs offered in the field of commercial economics so as to make them aware of the competencies required to be successful. This way their attention is focussed on the skills that are mentioned in advertisements for jobs which allows them to get the right picture of what future employers expect from them.

Support of regulatory learning processes
Regulative learning processes exist of mental activities focused on the coordination and control of the other learning processes, like planning, using checklists, participating in discussion groups, et cetera.

Information about the curriculum is put on the JCU-intranet. For each term a site ('term-site') is presented with concrete information about the professional role of that term, the competencies required, the literature involved, the lectures given, the training sessions planned, and the deadlines proclaimed. An essential point is that one of the old functions of lectures (informing the students about the organization of the program) is transferred to the web site.

As formulating the desired learning outcomes is one of the main features of the JCU, students must be informed about the intentions of a term. The term-site offers information and links required to build a view on the role and the competencies of that term. It contains as well a format to fill out the learning outcomes. This file can both be sent to the assessor for acceptation and put on the assessment site.

The term-site of the JCU-intranet contains a lot of information on the feedback of each assignment. To be sure the same approach is applied by all teachers, a format for feedback is developed, separating points of attention and criteria to measure the quality of each point of attention. This way the development of competencies is supported. For some of the assignments, the points of attention are the same every term, but the criteria get stricter.

Students who are responsible for their own study progress must be able to measure their own progress. Virtual support is offered by publishing self-assessment tests on the JCU-intranet. Not all qualifications can be assessed in this way, as some of the assignments are followed by reports and physical presentations. But the knowledge of basic concepts and procedures can be tested by multiple choice exams, giving straight forward feedback. If the knowledge is insufficient, links are offered to deficiency programs.

Evaluation of the JCU-system
'Learning is making sense of the world. Teaching is helping someone to learn.' (Tom Duffy, 2001). The Johan Cruyff University offers a revolutionary way of supporting elite athletes to learn. The focus is on 'learning to learn'. The real issue is not transferring knowledge from the heads of the teachers into the heads of the students, but to challenge students to find the answers to questions they are confronted with.

Internet and intranet, offer many opportunities to support the learning processes involved. They may offer packages of knowledge, but mostly books and periodicals are much easier to access than text on screen. Internet helps

students find information on current affairs and it leads to other interesting sites. But the main strength of the intranet system is that a whole new dimension is given to affective and regulative processes.

Still, concurrent with literature on distance learning (University of Illinois, 1999), there are not only advantages of internet. There are disadvantages as well. At the JCU sometimes technical problems or miscommunications resulted in student anger. To turn these reactions in constructive events, organizational measures were taken to create a cooperative atmosphere between students and staff.

Other difficulties that arose, were related to the formulation of desired learning outcomes. At the start of their academic career, students find it hard to formulate their desired learning outcomes. They are afraid that the more learning outcomes they formulate, the more chance they have to fail. But once they grasp the on-going process of competency development they learn to plan their study in steps and use the assessments as input for the next term.

As a matter of fact, students play different roles themselves. If they are responsible for their own learning process, they must be their own navigator, instructor, trainer, consultant and assessor at the same time. They must perceive the learning processes as an ongoing subject to think about. For that reason the first term of the first year is called 'the competent student'. In that term they learn about the JCU concept and get examples to gain some experience.

At the JCU attempts have been made to have the different roles of teachers performed by different people. To a large extent this was successful, but many logistic problems had to be solved. Some weeks are very busy for certain roles, whereas other weeks are really quiet. Only when teachers were able to fit in those irregular working hours in their other activities, a solution could be found. Combination of roles in one person (like instructor and assessor) were sometimes necessary to fit the logistic preconditions.

Another hurdle to take, was the creation of a database of multiple choice questions. Once a database is available, self assessments and official tests can easily be made at random, but before the database is ready, a lot of time is required to build up a solid foundation.

To relieve this problem, existing databases with fundamental multiple choice question should be incorporated. Furthermore cooperation between different universities, applying this concept, could work out profitable for all participants.

References

Baeten, J.J.M. (1998). *Op naar de 21e, Het nieuwe opleidingsconcept voor de voltijd HEAO van de Hogeschool van Amsterdam.* Breda: Citowoz .

Bednar, A. K., Cunningham, D., Duffy, T. M., and Perry, J. D. (1991). 'Theory into practice: how do we link.' *Instructional Technology: past, present and future*. G. J. Anglin, (ed.), Englewood, Co: Libraries Unlimited, pp. 88-102.

Boekaerts, M., and Simons, P. R. J. (1993). *Leren en instructie: psychologie van de leerling en het leerproces*. Dekker & van de Vegt, Assen.

Boekaerts, M. (1997), 'Self-regulated learning: a new concept embraced by researchers, policy makers, educators, teachers and students', *Learning and Instruction(7)*-2, 161-186.

Duffy, Tom. (2001). 'Two examples of course design at Cardena University'. Presentation at the 8th Edineb Conference in Nice, France.

Parry, S. B. (1996). The quest for competencies. *Training.* July, 48-56.

Roelofs, E. & Terwel, J. (1997). Contructivism and authentic pedagogy: State of the art and recent developments in the Dutch national curriculum in secondary education. Paper presented at the Annual Meeting of the American Educational Research Association (AER), Chicago.

Rotfield H.J. (2000). 'Lights!! cameras!! powerpoint!! now,….lecture'. *AMS Quarterly*, volume 3, February 2000 pp.6

Simons, Robert Jan, Van der Linden, Jos & Duffy, Tom. (2000). New Learning: Three Ways to Learn in a New Balance. In: *New Learning.* (ed. Robert-Jan Simons, Jos van der Linden and Tom Duffy). ICO. Dordrecht / Boston / London: Kluwer Academic Publishers.

Stoof, Angela, Martens, Rob L.& Merriënboer, Jeroen J.G. (2001). *What is competence? A constructivist approach as a way out of confusion.* Heerlen: Open University (in print).

Ten Dam, Geert, Vernooij, Fons, & Volman, Monique. (2000). New learning in Social Studies. In: *New Learning.* (ed. Robert-Jan Simons, Jos van der Linden and Tom Duffy). ICO. Dordrecht / Boston / London: Kluwer Academic Publishers.

Thijssen, Thomas P. T., Maes, Rik, and Vernooij, Fons T.J. (2001). Learning by Sharing: a Model for Life-Long Learning. In: *Educational Innovation in Economics and Business VI:* (in print: ed.). Dordrecht / Boston / London: Kluwer Academic Publishers.

University of Illinois. (1999). 'Teaching at an Internet Distance: the Pedagogy of Online Teaching.' *The Report of a 1998-1999 University of Illinois Seminar*, www.vpaa.uillinois.edu/tid/report, 07-02-2000.

Vermunt, J. D. H. M. (1992). *Leerstijlen en sturen van leerprocessen in het hoger onderwijs: Naar procesgerichte instructie in zelfstandig denken*, Swets & Zeitlinger, Lisse.

Vernooij, A. T. J. (1996). Der Einfluss unterschiedlicher fachlicher Strukturen auf die Entwicklung mentaler Repräsentationen. In: *Rechnungswesenunterricht und ökonomisches Denken. Didactische*

Innovationen für die kaufmännische Ausbildung, (Red: P. Preiss und T. Tramm.) Wiesbaden: Gabler GmbH, 139-157.

Vernooij, A.T.J. (1999). *A swot-analysis of 'Trade Company'. The educational structure of a management game*. Paper for the 6th Annual EDINEB International Conference in Bergen, Norway.

Vernooij, A.T.J. (2000). Tracking down the knowledge structure of students. In: *Educational Innovation in Economics and Business V: Business Education for the Changing Workplace* (ed. Lex Borghans, Wim H. Gijselaers, Richard G. Milter and John E. Stinson). Dordrecht / Boston / London: Kluwer Academic Publishers.

Vernooij, A.T.J., Thijssen, J.P.J. & Schermerhorn, R.H. (2001). *New media and their role in education*. Paper for the 8th Annual Edineb International Conference in Nice, France.

Notes on the authors

(1) Dr Fons (A. T. J.) Vernooij
was (at the time) Educational manager at the Johan Cruyff University, IME, Hogeschool van Amsterdam, the Netherlands.
E-mail: mail@fons-vernooij.nl
Homepage: www.fons-vernooij.nl

(2) Thomas (J. P. T.) Thijssen EMIM
E-mail: j.p.t.thijssen@saxion.nl