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New findings in the psychology of learning and their effects on dealing with knowledge in teaching

**Prof. Dr. Gerhard Steiner, Institute of Psychology,
University of Basel, Switzerland**

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INTRODUCTION

The processes showing how a learning individual acquires knowledge are analysed and explained with a model of memory (diagram 1). From the findings on learning processes of students, reflections are made and measures taken concerning the planning and implementation of knowledge acquisition for the lecturers.

The functions of the individual in dealing with knowledge and knowledge acquisition (diagram 2)

New information that has to be learned reaches the consciousness of the learning individual - or in terms of psychology of learning, the working-memory - via the human ultra- short-term memory. In the short-term memory, the information is processed and linked to already existing knowledge. In view of the huge amount of information to be processed, the learning individual encounters some difficulties and problems. These will be clarified and explained with a model of memory.

The functions of the lecturer in dealing with knowledge and knowledge acquisition (diagram 3)

The lecturer, who wants to understand the learning processes that take place in acquiring knowledge, and the difficulties experienced by the students, starts with an adequate selection of the material: he analyses the material, and sets the learning goals in a way that makes it clear to the students what conceptual elements or contents they have to learn, and what important connections are needed for them to understand and remember. Because of the analytical reflections made by the lecturer, the knowledge that has to be acquired by the students becomes clear and transparent, and the lecturer is able to prepare thoroughly the construction process needed to guarantee the knowledge acquisition. He is assessing the degree of difficulties presented by the material and deciding on the size of „learning chunks“ as well as the learning pace. He is also going to decide which parts of the construction process need special attention, perhaps repetition or illustration. At the same time, he is going to find opportunities to check to what extent and in what quality the new material has been understood and can be retrieved.

With his planning, the lecturer contributes substantially to the success of the knowledge acquisition process of his students, which will in turn motivate them for classes as well as enhance their willingness to actively start acquiring knowledge on their own (promoting an autonomous knowledge acquisition of the students). The focus is generally on essential tasks and help a lecturer can give to his students in order to guarantee that all the information provided can be turned into individual knowledge i.e. understood, assessed and finally stored in an adequate form in the long-term memory, and that there is a high degree of probability that the information can be recalled at the right moment. In this course, processes of enhancing understanding, optimising encoding, systemising repetition, recalling from the long-term memory and transferring of the acquired knowledge to a new situation will be discussed. Of course, it becomes clear that it is not only about acquiring conceptual knowledge but also about processes (that are controlled by certain forms of knowledge) that have to be learnt in the same way.

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Curriculum Vitae of Gerhard Steiner

Professor of Psychology and Chairman of the Department of Psychology
at the University of Basel (Switzerland)

1937	born in Basel (Switzerland)
1948-1958	Eduation from Mathematisch-Naturwissenschaftliches Gymnasium and Teachers' College at Basel
1964-1971	Teaching several school levels (including Realgymnasium Basel) and studies in Psychology, Philosophy, Mathematics and History of Arts PhD thesis summa cum laude on "Mathematics as a tool for an intellectual education"
1971-1976	Research Assistant at the University of Berne Lecturer for Educational Psychology at the Teachers' College of the University of Basel
1976-1977	Post-doc Research Fellowship at Stanford University (California) in memory and cognition (with Prof. Gordon H. Bower)
1978	Habilitation at the University of Berne Full professor for Psychology and founder of the Department of Psychology at the University of Basel
1978-1986	In parallel: Director of the Swiss National Research Program Nr. 10 (Swiss National Science Foundation) on Vocational Education in Switzerland (Berufsbildung in der Schweiz) Leader of both research and educational projects in cooperation with both public institutions and private companies in a variety of human resources areas: SBB, Technical Colleges in Switzerland, Basel State's Hospital, Swiss Army, Schering, Ciba-Geigy, Bally, Novartis, UBS and others.
1985-	Member of the International Board of the Max-Planck-Institute for Psychological Research Munich (-1996), of the International Board of the Training Center of the Swiss Bank Corporation (Bankverein) Thun (-1995), of the Board of the College for Applied Psychology Zürich, of the Swiss National Institute for Vocational Education, Zollikofen/Berne.
1986	Visiting Professor at the University of Padova (Italy) on "Learning and Memory"
1988-1989	Dean of the Faculty of Humanities (Phil. I) University of Basel
1992-1996	Member of the Scientic Board of the Swiss Army (Militärwissenschaftliche Arbeitsgruppe des Chefs Heer)
1994-	Faculty member Swiss Banking School, Executive Program, Advanced Executive Program
1996-1998	Member of the Governmental Committee for the Restructuring of Personnel Politics in Basel
1996-	Member of the Advisory Board of the European Center for Pharmaceutical Medicine ECPM (for Human Resources' concerns)
1998	Visiting Professor University of New South Wales, Australia Visiting Professor
2001	Visiting Professor Queensland Technical University, Brisbane, Australia