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SESSION 15

Didactics of chemistry and biochemistry

Organized by Z. Walter, M. Gniazdowski

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Oral Presentation

Role of scenario in problem-based learningJózef Dylewski¹, Leszek Rębała²

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The didactic scenario in biochemistry is a detailed description of student and teacher's (tutor's) activity in the learning process.

The PBL scenario consists of the following steps in the tutorial process (Maastricht seven jumps): 1. Clarify unfamiliar terms; 2. Define the problem; 3. Brainstorm possible hypotheses; 4. Arrange explanations

into a tentative solution; 5. Define learning objectives; 6. Gather information and private study; 7. Share the results of information gathering and private study.

The most important component of scenario in biochemistry is the problem, often existing in clinical context. The assessment is also an element of the scenario. Supported by a grant No 5 H01F05821 from the State Committee for Scientific Research (KBN, Poland).

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Oral Presentation

Comparison of scores awarded at admission examinations and the final examinations of bioorganic chemistry at the medical studies. Experience of 2000 and 2001

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A selection of the applicants to medical studies in Poland is made through test examinations which are composed of multiple choice questions. The test consists of equal numbers of questions in biology, chemistry and physics – total 120 items. A value of admission examinations for a prediction of medical students' achievements in their basic sciences studies was intuitively agreed but infrequently approached.

Students pass an examination in bioorganic/medical chemistry at the end of the 1st year. Our observations of a limited number of students who had been awarded the highest scores at the admission tests revealed for several years a general consistency of their rank with the grades that they were granted at the final examination. They agree with a report indicating a moderate correlation between the scores in physics at the admission and results of examinations at the Medical University of Poznań [1].

Comparison of scores of students admitted at the full time course to the Medical University of Łódź (MUL) in 2000 and 2001 with the grades they got at the first exam attempt at the 1st year are of particular interest. It was reported [2] and subsequently confirmed by the prosecutor's investigation that several examinees had acquired a preearly access to the examinations booklets and/or test answers in 2000. Although an exact num-

ber of applicants taking the unfair advantage remains unknown this leak heavily affected a ranking. No irregularities were claimed at the admission procedure in 2001.

The irregularities in 2000 were manifested by an unusual number of applicants (28 in Poland and 6 at MUL) who were awarded a maximum score (120/120) in the competition for studies of medicine and dentistry. The highest score in 2001 was 116/120. When the grades awarded at the final examination of medical chemistry are plotted against the identified position number (No.) at the admission list in 2000 a non-linear regression curve shows a minimum at No. 1-10 with an average grade (X) below 2.4 which is followed by a small peak at Nos mid-20s and a broad maximum at Nos 140-160 with $X \sim 3.3$. The grades of 2001 when accordingly plotted show a peak at Nos 1-10 with an average $X \sim 4.6$ and the regression curve decreasing smoothly. Hence a comparison between these two groups offers a unique opportunity to show importance of offering the applicants a fair competition at the admission procedures for their achievements in basic sciences.

References:

1. Kucharski M (1996) *Neodidagmata*, 22: 119-126.
2. Podolska J, Gnacikowska W (2000) *Gazeta Wyb*, 29/30.07, pp 10-11.

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Oral Presentation

Elements of biochemistry in school teaching programmes

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Some major changes in the Polish educational system have been introduced since 1999. Three levels of education have been established: a, six year primary school; b, three year grammar school; c, three year secondary school.

For all new types of schools especially adjusted programme basis was prepared, on the grounds of

which the publishers constructed teaching programmes and school textbooks. The aim of the paper is to present some conclusions drawn from the analysis of the programme basis and grammar and secondary schools teaching programmes conducted in order to establish the amount of biochemistry elements contained in them.

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Oral Presentation

A change from a traditional to an active learning in biochemistry – option or necessity: the Poznań experienceAleksander Przystanowicz¹, Józef Skrzypczak², Wiesław Trzeciak³

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There are many changes in the undergraduate medical education all over the world. They mainly concern medical curricula (physician's competences as a basis of education, early clinical contact), methods of teaching and learning (a preference for active learning) and organization of teaching (interdisciplinary integration, didactic modules).

The subject of our educational research was teaching and learning biochemistry at the medical faculty. The research has been conducted by the Department of Biochemistry and Molecular Biology, and the Department of Medical Education, University of Medical Sciences in Poznań, in cooperation with the Faculty of Educa-

tional Sciences of the Adam Mickiewicz University in Poznań.

The study focused on: 1. Modernization of biochemistry curriculum (competence-based curriculum, module-based structure of curriculum, curriculum led by learning objectives); 2. Evaluation of effectiveness of traditional and problem-based learning (higher effectiveness of PBL and students' satisfaction is expected).

Aims of our research were: 1. Designing of modern curriculum in biochemistry. 2. PBL scenario. 3. Defining the methods of assessment.

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Oral Presentation

Evaluation of biochemistry teaching of pharmacy students in Medical University in Warsaw

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The aim of biochemistry teaching at the Faculty of Pharmacy, Medical University in Warsaw, is to acquire knowledge in the field of living organisms functions on the basis of their molecular structure and metabolism, as a basis for understanding:

– the mechanisms of activity and metabolism of drugs and other xenobiotics; – biotechnological methods in drug discovery, biosynthesis, analysis and therapy, – differentiation of normal and pathological states of human being.

Biochemistry course, realised by the didactic team of Department of Biochemistry and Clinical Chemistry during winter semester of the 3rd year study, contains 45 hours of lectures and 75 hours of laboratory training.

Since 1998 to 2003 seven hundred and seventy two students credited for biochemistry course, participated in didactic survey using validated, anonymous questionnaires, containing 24 questions. The number of the questioned students in relation to the numerical force of 3rd year pharmacy students amounted $84.5 \pm 4.0\%$.

Results of our survey shows that $85.5 \pm 2.3\%$ of the students consider biochemistry an interesting subject of study. In opinion of $87.7 \pm 7.6\%$ of the students the educational system and organizational forms of biochemistry teaching are good, academic teachers have extensive knowledge and high competence in teaching, connected with kindly and friendly attitude towards

students. A majority of the students ($77.6 \pm 8.5\%$) pronounced the opinion that the curriculum of biochemistry lectures and laboratory training contain current information about development of biochemical sciences. At the same time $59.2 \pm 5.1\%$ of students pronounced the opinion that biochemistry is difficult subject of study. In specific comments many of the students suggested the extension of biochemistry teaching time or separation the molecular biology as an independent subject of the study.

The results of this survey indicate that: – students have high opinion of biochemistry teaching; – a didactic survey using questionnaires is a valuable reversible information source on the educational process; – conclusions flowing from the students opinions are important elements in the improvement of teaching contents, methods and forms.

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Role of clearly defined learning objectives in biochemistry curriculum and student assessment

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The function of learning objectives is orienting of teaching and learning. They define precisely the knowledge, skills and attitudes of students in biochemistry teaching and learning. In medical faculties in Poland the goals, aims and objectives of biochemistry are not exactly defined, so there is no basis for the right orienting of teaching/learning process and for the assessment. Modernization of learning objectives is a necessary component of the optimalization of teaching and learning in biochemistry.

The educational research conducted by the Department of Biochemistry and Molecular Biology of University of Medical Sciences in Poznań allowed for modernization of biochemistry curriculum: designing the set of objectives connected with modular units. Learning objectives were also closely connected with assessment: summative and formative assessment, tutor- and peer-assessment.

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