

## » Between Physical Examination and Phylogeny – Practice-Related and Background Topics Evaluated in a First-Year Anatomical Seminar

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**Zwischen körperlicher Untersuchung und Stammesgeschichte – Evaluation von praxisbezogenen Hintergrundthemen in einem vorklinischen Anatomie-Seminar:** Die vielfältigen Krisen der modernen Medizin erfordern einen umfassenden Blick auf den Menschen. Dafür sollten auch Aspekte seiner Stammesgeschichte und Evolutionsbiologie in die medizinische Ausbildung aufgenommen werden. Im Sommersemester 1998 wurden in einem anatomischen Pflichtseminar am Institut für Anatomie der Freien Universität Berlin sowohl traditionelle angewandt-anatomische als auch hintergründige Themen behandelt. Im ersten Teil wurden die Grundlagen und Verfahren der körperlichen Untersuchung erarbeitet und geübt. Der zweite Teil konzentrierte sich auf Aspekte der menschlichen Evolution, der evolutionären Medizin und des wissenschaftlichen Arbeitens. Wie die Evaluierung ergab, stimmten sowohl die primär interessierten als auch die primär nicht interessierten Seminarteilnehmer darin überein, dass in anatomischen Pflichtseminaren hintergründige Themen nahezu in demselben Maße wie praxisbezogene behandelt werden sollten.

**Summary:** The crises of modern medicine require a comprehensive view of man. Therefore, aspects of the evolutionary and environmental background of mankind should be introduced into the curriculum of medical studies. In the summer term (1998), a mandatory seminar in anatomy held at the Free University of Berlin treated traditional practice-related topics as well as background themes. In the first part, principals and methods of physical examination were presented and trained. The second part focused on aspects of human evolution, evolutionary medicine and scientific working. Student acceptance was evaluated. Both primarily interested and primarily not interested participants agreed that background themes should be treated in mandatory anatomy seminars almost to the same extent as practice-related topics.

**Key words:** Seminars in anatomy – Paleoanthropology – Evolution – Darwinian medicine – Scientific working

### Introduction

To overcome the crises in modern medicine, it is necessary to take a comprehensive view of man and broaden the scope of teaching to include the evolutionary and environmental background of mankind [1]. Anatomy is the most suitable field with which to accomplish this goal through familiarizing future doctors, from the beginning of their medical education, in the medical curriculum and also provides students with basic insights into scientific work and other important aspects of general interest. The greatest advantage of using small groups, like seminars, is their suitability for most effectively tackling new topics or testing them under real conditions without having to make major changes to the curriculum. After two seminars of anatomy on phylogeny in its environmental context [2], we dealt with this as well as clinical themes in one seminar entitled „Anatomy, Evolution, Diseases, and Diagnostics“. We used a normal pre-clinical seminar as an easily implemented research project to evaluate and compare students' acceptance of both practical and background topics.

### Methods

Mandatory anatomy seminars at the Free University of Berlin are held, together with a dissection course in macroscopic anatomy, in the second semester of medical studies. In the summer term (1998), our seminar comprised an introduction and five 130-minute sessions (along with an extra tour of a prehistoric museum for students who had missed too many sessions). The first and second meetings were devoted to applied clinical anatomy. Students presented papers on physical examinations (Table 1). The lecturer demonstrated physical examination techniques which were then practiced by the students.

**Table 1** Papers presented by students on practice-related topics

Physical examination of the abdomen
Physical examination of the lungs
Physical examination of the heart and circulation
Neurological examination I: Motoric system, reflexes
Neurological examination II: Sensory system, balance and coordination

**Table 2** Background topics presented by students

The Australopithecines
<i>Homo habilis</i> and <i>Homo erectus</i>
Neanderthals and <i>Homo sapiens</i>
Darwinian medicine
Infectious diseases and moribific agents
Efficiency of modern diagnostic methods

In the second part of the seminar, one meeting was completely devoted to student presentations on background topics (Table 2).

The amazing ineffectiveness of modern diagnostic methods was discussed in connection with student presentation of an original paper [3] as an exercise in scientific investigation. The fourth meeting was a visit to the exhibition „Missing links alive“ covering the last 4 million years of hominid phylogeny, as it was on display in Berlin at that time. The fifth session took place in an open-air museum set up as a medieval village with carefully modelled houses, typical farming and cattle ranching. The two excursions served to demonstrate the enormous differences in the lifestyle of man before and after the „Neolithic Revolution“ as well as the evolution of human pathogenic microorganisms before and after this turning point in world history.

Twenty (14 males and 6 females) of the twenty-one participating medical students completed a questionnaire handed out at the end of the seminar. The first question (Table 3) asked why they chose this seminar. Other statements (Table 4, 5) compared the ratings of practice-related (proximate) and background (ultimate) topics. Finally, two open-ended questions asked what students had liked most and least about the seminar.

**Table 3** Student motivation for taking this seminar

Statement (1): What was the main reason for choosing this seminar?
(a) Because I was curious or interested in the topics
(b) Because of the excursions
(c) Because I expected an easy course
(d) Because it took place at a favourable time
(e) Because I could not participate in another seminar I would have preferred
(f) Because I thought of nothing better
(g) Because friends of mine wanted to participate and took me with them
(h) For other reasons (open-ended)

The evaluation of Statement 1 (Table 3) yielded interesting results requiring further analysis. Students fell into one of two groups of comparable size: primarily interested participants (PIP), and those participating for other reasons (not primarily interested participants, NPIP). With this grouping the rating proximate vs. ultimate topics could be analysed for differences based on student motivation and primary interest using an in-

**Table 4** General rating of practice-related and background themes

Statement (2): If you had to decide the extent to which practice-related and background topics were to be treated in mandatory anatomy seminars in the preclinical medical curriculum, where would you put the emphasis on a scale of 1 (only practice-related topics) to 10 (only background topics)?

practice-related topics	1	2	3	4	5	6	7	8	9	10	background topics
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dependent *t*-test. The significance level was set at  $p < 0.05$ . All numerical data are expressed as mean  $\pm$  SD.

## Results

Motivation separated the participants into two groups: Of the 11 students (55%) who chose the seminar mainly because they were interested in the topics (Statement 1a, Table 3), 4 also selected it because it took place at a favourable time (Statement 1d, Table 3). They comprise the PIP group. The NPIP include the other 9 students (45%). Eight had not been able to participate in another seminar of their first choice (Statement 1e, Table 3), and one took part only because of the favourable time (Statement 1d, Table 3).

To answer the most important question of all (Statement 2, Table 4), a ten-point scale was used for a more subtle rating. The answers given by both groups yielded an identical mean value of 4.4. The SD was  $\pm 1.6$  for PIP and  $\pm 2.5$  for NPIP ( $p = 0.93$ ).

For a more detailed comparison summarized in Table 5, students used a six-point scale which corresponds to the grading system in German schools.

Very individual answers were given to the two open-ended questions asking what participants liked most and least about the seminar. The only aspect that students almost generally criticised was the requirement to hold presentations.

## Discussion

The rating of practice-related and background topics differed between the two groups to a much lesser degree than expected (Table 5). Differences are largely negligible in the objective rating of usefulness (Statement 3a) but concentrated in the subjective acceptance. There is an almost significant difference in the way the students personally liked both, the practice-related and background topics (Statement 3c). Surprisingly, the only significant difference is in the way the students judged the working atmosphere in the seminar (Statement 6). This may lead to the conclusion that the students distinguish clearly between their emotions and their rating of course content. However, a common criticism in the open-ended questions and during the course from both the students and the lecturer was that all presentations on background topics (Table 2) were held in one term, and thus there was not enough time for discussion. Nevertheless, our experimental seminar had to be completed in the timespan described by the curriculum. Thus, the concentration of presentations could not be avoided, and even though explained to the participants, it still may have negatively influenced the rating of ultimate topics in some ca-

**Table 5** Students comparison of practice-related (proximate) and background (ultimate) topics and rating of the extent of work and working atmosphere

Statement	Very useful/ very high/ very good		3	4		5	Not useful at all/ very low/ very poor		<i>p</i>
	1	2		NPIP: Mean + SD			6		
(3) How would you rate the usefulness of the proximate/ultimate topics									
(a) for studying and examinations	2.6 ± 1.2/3.7 ± 0.9			3.3 ± 0.7/3.9 ± 0.8			0.14/0.68		
(b) for the medical profession	2.1 ± 0.8/2.6 ± 0.8			2.4 ± 1.0/3.0 ± 1.2			0.40/0.44		
(c) for yourself; how did you like it personally	2.0 ± 0.9/2.2 ± 0.9			3.1 ± 1.5/3.0 ± 1.0			0.06/0.07		
(4) How would you rate the way the proximate/ultimate topics were treated	2.5 ± 0.8/2.6 ± 0.9			2.7 ± 1.0/3.1 ± 0.9			0.61/0.27		
(5) How would you rate the extent of work	3.6 ± 1.2			3.2 ± 1.0			0.53		
(6) How did you like the working atmosphere	1.9 ± 0.7			3.0 ± 1.1			0.02		

Note: In Statement (3) and (4), the values before the slash apply to the proximate topics and those behind to the ultimate ones. The *p* values apply to the corresponding answers of the PIP and the NPIP groups to the same question, the value before the slash to the proximate and the value behind to the ultimate topics.

ses. The question of whether a specific, comprehensive experimental seminar would have provided more valid results for our study is not clear: It is doubtful whether it would have been comparable to the normal seminars. Moreover, the comparison of two normal seminars, one with conventional and the other with background topics, would have also been insufficient, since the participants in each seminar would have been missing one of the topic groups. Thus, our method seems appropriate, although it can, of course, only provide heuristic results.

The most remarkable result is that the importance attached by both groups to the background topics in the anatomical seminars is almost as high as to the practice-related ones, although the standard deviation indicates a less homogeneous rating by the NPIP (Statement 2, Table 4). We expected a more realistic view with an emphasis on topics relating to examinations. We regard this open-mindedness even in stressed medical students as a good omen for a broader view of medicine, e.g. in the establishment of Darwinian medicine. As these preclinical seminars have shown, it is not necessary to make revolutionary changes in the curriculum in order to include important background topics at an early point in medical training.

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