Joachim Kornelius, John Stewart, Heidelberg

Translation Meets Medicine: Teaching Medical Terminology

Background

The initial impetus for developing this project came with the insight that university students in two different fields of study, namely *translation* and *medicine*, must surmount similar learning obstacles in acquiring vast amounts of medical technical terminology. Medical students must master this vocabulary in order to eventually communicate with colleagues and patients and to read professional journals and other literature related to their future careers as medical professionals. Similarly, translation students must understand the medical terms of a given source language in order to correctly render them in the target language.

Both professions require of their practitioners an ability to find and use the appropriate reference materials for their medical terminological needs. Thus there is a common prerequisite: a highly-developed competency in the use of computer-based tools, tools of data-mining, particularly multilingual databases and their integration in CAT-tools (Lüdtke 2004). This common ground entails that university study programs for both medical students and translators must pursue efficient and effective methods of imparting terminological knowledge and skills (Kornelius 2004).

Unfortunately, university instruction in both fields often takes place in a traditional classroom mode: teacher-centered lecturing that attempts to fill students' brains with factual information as if they were empty vessels. Recent research in the psychology of learning shows that this model of learning does not lead to maximally effective teaching. A more promising approach is described in the following section.

Problem-Based Learning

Finkle and Torp (1995) define Problem-Based Learning (PBL) as a "curriculum development and instructional system that simultaneously develops both problem solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem solvers confronted with an ill-structured problem that mirrors real-world problems."

Problem-based learning takes place in a specially-designed learning environment in which students in small groups are confronted with real-life cases, and they are challenged to solve them as a team. The traditional role of the teacher is restricted to that of a facilitator or resource person. Students direct their own learning and discover that their learning is multidisciplinary in nature. Further, students assign themselves roles within the small group. Ample time between group sessions is allowed for independent study.

Resolving the problem involves a process comprising several steps. Students are presented with an "ill-structured" problem: a scenario in its raw form. Group knowledge is gathered and organized to solve the problem in a step-by-step procedure. Students determine what knowledge they already possess and what is needed to progress to the next level of problem-solving. Strategies are developed for accessing necessary knowledge and the group proposes a hypothesis to test. In the final phase, students present and defend their solution. At all times the facilitator requires students to communicate, to raise questions, and to present their findings and recommendations to the group.

Problem-Based Learning is particularly effective in imbuing students with a highly developed affective relationship to cases presented. In preclinical medical courses it leads to a vivid, personalized identification with the case. The case and the affected patient are preserved along with his medical malady and case history in prominent mental images within the student's long-term memory. Such images are easily conjured up in his future medical practice, and become part of his professional knowledge and competence.

Project goals

Having recognized the common ground between the educational needs of medical and translation students, and with an eye to the pedagogical progress offered by constructivism and problem-based learning theories, the investigators have formed an international partnership for this research project with the following goals:

To compare the terminological demands placed on medical students as opposed to translation students, as well as on practitioners in both fields.

To gauge the severity of the language barrier between medical professionals of German-speaking and English-speaking backgrounds and offer suggestions as to how this barrier can be overcome.

To investigate the cognitive learning processes involved in the acquisition of copious amounts of specialized technical terminology. This is independent of native language and professional goal, whether becoming a physician or a translator.

To describe and evaluate the spectrum of teaching methodologies employed in university medical terminology courses, with comparison of achievement forms and results.

To conduct a survey of the available medical terminology reference and teaching materials, with special emphasis on online resources, and to evaluate their effectiveness. Additionally, to formulate suggestions to publishers for improvements in reference and teaching materials.

To develop a multimedia, online database of medical terminology in English, German, and Spanish that can be used by medical students and other health care professionals, as well as translators. This database will include all terminology relevant to cases presented in case-based medical courses.

At present, some of these research goals have already been met through the activities of students and instructors in a research seminar, *Teaching Medical Terminology* (TMT), conducted at the University of Heidelberg's Seminar for Translation and Interpreting. In particular, the survey of available reference and study materials has yielded a broad overview. Students who evaluated online medical dictionaries and

medical terminology courses for individual/distance study found a broad range of variation with regard to quality, scope, user-friendliness, aesthetic appeal, and price/value ratios. Many of the online dictionaries are available free of charge, but contain advertising and conspicuous product endorsements (e.g. for pharmaceutical products). Some resources inspire confidence right from the point of entry with a professional design, color scheme, and information architecture. The best resources offer a clear overview of their content and even allow users to try out a sample course chapter or other segment before committing to purchasing or subscribing to the service. Many of the online medical terminology courses available today are geared toward medical service providers other than doctors–namely nurses, transcribers, technicians, etc.

The TMT seminar produced a number of additional insights into cross-linguistic and cross-cultural differences in teaching and learning medical terminology. Observations confirmed that in general, English-speaking students are trained from an early age to practice new or difficult vocabulary items by spelling them. This is necessary in an Anglophone context primarily because of the wide disparity between the phonetic make-up of words and their orthographic representation. But it also facilitates learners' acquisition of the words in question by providing an additional mode of input; rather than just receiving the auditory input of hearing the word pronounced, learners visualize the word in its written form. In the German-speaking world, there is less need for this mnemonic strategy, due to the closer correspondence between phonetic and orthographic form. Medical professionals who seek to communicate with colleagues across the English-German divide will encounter consistent, but different orthographic practices on both sides.

The research program of the seminars yielded concrete recommendations that could improve the state of the art in the didactics of medical terminology. Among these, a combination of "learning by discovery" methods, with its emphasis on visual and emotional concepts, and multimedia presentation via electronic media seems to be the most promising approach to teaching technical terminology.

Further insights into the first and second project goals will be sought through interviews with practicing doctors in the United States and Germany. Seminar participants to date have agreed that the cognitive processes involved in learning copious amounts of specialized technical terminology warrant considerable further attention. Second language acquisition researchers have investigated the processes involved in learning general vocabulary in a second or foreign language, but relatively little is known about the special case of learning technical terminology.

The TMT project aims to begin filling this gap. The TMT seminar offered some initial impressions of terminology-teaching methodologies employed at medical schools on the basis of courses offered at the partner institutions. For a broader overview, participants in future TMT seminars will survey other medical schools reported to be employing a problem-based approach to teaching (e.g. Harvard University, Queen's University at Kingston, McMaster's University, West Hamilton, University of Toronto, etc.)

In addition to the two seminars described above, six masters-level theses and two dissertations on the subject of teaching medical terminology are in progress.

Two of the masters-level theses have already been completed and are ready for publication. All works will be published by the WVT Wissenschaftlicher Verlag Trier at www.lighthouse-unlimited.de.

International visits by participants from both sides of the Atlantic continue to reinforce the project. In addition to firsthand research observations led by J. Kornelius at the Northwest Center for Medical Education in Gary, Indiana, P. Bankston, the director of the Northwest Center, has visited Heidelberg University and lectured on Problem-Based Learning at the university's School of Medicine.

We are now embarking on a new phase in this academic venture as we begin to exchange students at the graduate and post-graduate level. Through direct personal experience and involvement, they will be able to gather valuable insights into this evolving international academic cooperation and contribute directly to its further development. These

exchanges will take place without the necessity of extensive bureaucratic involvement.

Specific activities to meet the goals and objectives

Our project goal involves the creation of a web-based, trilingual medical knowledge and terminology database, derived from the printed problem-based teaching materials of Indiana University's Northwest Center for Medical Education. This will entail terminology data-mining, extracting terminology from a large corpus of medical technical texts in German, English, and Spanish, importing lexicographic data on the terms included, and programming a web-based database with a user-friendly and editable data entry structure. Photographs to accompany the terms defined and audio recordings demonstrating pronunciation will provide multi-modal support for the learning process.

Further, there are plans to develop trilingual, multi-media training software in medical terminology, informed by and simulating the conditions of text production.

Another activity will be to develop a problem-based medical-language teaching module for translation students which takes an ill-structured medical problem as its point of departure. This will create further opportunities for undergraduate students to become involved in the ongoing research project.

Perspectives

This project aims to develop new approaches to Translation Studies pedagogy. New methods and materials developed within the framework of the project will be implemented first at the Seminar for Translation and Interpreting, University of Heidelberg. The effectiveness of innovations made in this area will lend themselves to concrete assessment in the form of course evaluations to be completed by students, as well as feedback from instructors and members of the

medical professional community, as well as the project's collaboration partners in both Indiana and Germany.

In these times, interdisciplinary and international academic exchanges of this kind are of particular importance.

Notes

Bankston, P. W. "The Case as an Integrator of Basis and Clinical sciences." *Workshop on Integration of Basis and Clinical Sciences*. Columbus, Ohio, 1995.

Blumstengel, A.: *Entwicklung hypermedialer Lernsysteme*. Berlin, 1998.

Edelmann, W.: *Lernpsychologie*. (5., vollst. überarb. Aufl.). Weinheim, Basel, 1996.

Finkle, S. L., Torp, L. L.: *Introductory Documents* 1995: 1 (Available from the Center for Problem-Based Learning, Illinois Math and Science Academy, 1500 West Sullivan Road, Aurora, IL 60506-1000).

Kornelius, J: "Texten und Übersetzen in vernetzten Wissenskonstruktionen". *AREAS*. 27, 2004.

Lüdtke, Kati: *TRADOS und Across: CAT-Tools in der Evaluation und im Vergleich*. Trier, 2004.