Zemliansky P.,
USA

HUMANIZING HIGHER EDUCATION IN SCIENCE AND TECHNOLOGY THROUGH ACADEMIC WRITING INSTRUCTION

Recently, I had the pleasure of visiting the National Technical University Kharkiv Polytechnic Institute. The visit was a continuation of my long-standing collaboration with several faculty members and administrators of KhPI, which has so far resulted in several joint publications and a teaching project. During my recent visit, I facilitated a seminar with a group of graduate students as well as delivered a presentation to the faculty on the design of academic writing instruction in the disciplines.

My interactions with both faculty and students of KhPI once again confirmed the idea that, although the Ukrainian and US higher educational systems may be different structurally and administratively, we as teachers want the same things for our students, regardless of where we live and work and what language we teach in. Both in the US and in Ukraine, higher education professionals are concerned about helping their students to develop the ability to think independently and critically, to solve complex problems, and to communicate effectively. Both Ukrainian and US educators are constantly looking for better ways to enable their students to achieve those goals.

One proven method of teaching students better critical thinking, problem solving, and communication abilities is through the integration of writing assignments into curricula in various academic disciplines, including the disciplines in science and technology, such as engineering. Research shows that when given multiple opportunities to practice writing, both for the purpose of communication as well as for learning, students develop a better ability to analyze and apply information, to make their own conclusions and interpretations of data, and to solve academic and professional problems. US researchers Elizabeth Wardle and Doug Downs, for example, have shown that frequent practice in writing allows beginning university students to develop what they call "transfer skills," or the ability to analyze other learning and writing situations and to apply what they learned about writing and critical thinking in other university courses. This ability, according to Wardle and Downs, makes learners more adaptable to the demands of the modern academic, professional, and civic worlds.

Similarly, in his influential book Engaging Ideas, another US-based researcher John Bean argues that giving students so-called "writing-to-learn" assignments results in a better learning of the course material, in any discipline, as well as in improved written communication skills. "Writing-to-learn" assignments are short, informal tasks which do not usually result in formal academic papers, but which demand active and critical thinking from students, and that thinking is done through writing. In my own work, I have demonstrated how diverse and innovative writing assignments help students achieve deeper learning of both the content of their discipline and of communication skills.

Having collaborated with the faculty and administrators at NTU KhPI for almost seven years now, I have noticed their understanding of the benefits of integrating writing instruction into the teaching of academic disciplines as well. For example, in collaboration with Drs. Goroshko and Reshetnyak, we have held fruitful discussions about the possibility of integrating writing instruction into their courses.

At the University of Central Florida, I direct the university-wide program in Writing Across the Curriculum (WAC). In the US, WAC is a sub-area in the academic discipline of writing studies which researches and integrates ways of improving student learning through writing. At UCF, my colleagues and I help teachers in other academic departments to understand the main ideas of writing theory and pedagogy and to apply them in their courses. We work with all departments, from the humanities to natural sciences, to engineering. In the past two years, we have successfully completed initial training in writing instruction for about fifty faculty members from twelve departments across our university.

Some of our success stories at UCF have been our projects with the Departments of Chemistry, Mathematics, and Electrical Engineering and Computer Science. Under our guidance, teachers from those departments have developed effective writing assignments for their students. The over-reaching purpose of those writing assignments has been not only to provide students with better academic and professional communication skills, but also to "humanize" their technical and scientific education by providing them with the opportunity to critically think about and reflect on the content of their academic disciplines. For instance, an electrical engineering and computer science teacher developed short writing assignments for his students, in which they are asked to explain their solutions of mathematical problems.

The work we do as well as the work which some of NTU KhPI's professors are beginning to do, integrating discipline-specific writing instruction into their courses, shows substantial promise of "humanizing" higher education in the natural sciences and engineering disciplines. The ability to use language effectively, both for communication and for thinking and reflection, is crucial for members of all professions. Moreover, it is crucial for engaged citizens who live in a democratic society. The "humanization" of scientific and engineering education through systematic writing instruction will help institutions of higher learning to achieve these important goals.

I would like to conclude with a list of strategies and steps that interested higher education administrators and professors may wish to consider in order to begin incorporating academic writing instruction into their courses. When considering such integration, it is very important to remember that our goal as teachers is always better learning for our students.

Consider yourself and ask your students to consider what are important skills and "ways of thinking" for members of their profession. For example, it stands to reason that engineers need not only to know the "technical content" of their discipline, but also be able to collect and analyze data, solve problems, predict difficulties, and so on.

If possible, create or re-design courses which combine the teaching of "technical content" (through lectures, seminars, laboratory sessions, etc.), with creative and critical reading, thinking, and writing activities.

Offer students a variety of writing tasks and exercises. Some of these tasks may be designed to help them become better communicators while others may be used solely for the purpose of developing their critical thinking skills. The assignments in the first category then are likely to be more formal and structured while the tasks in the second group are more likely to be shorter and less formal.

Administrators of universities, faculties, and departments should encourage networking among faculty interested in humanizing scientific and technical education through writing. They should create informal and formal discussion groups and other opportunities for exchange of ideas, such as seminars, master-classes, and conferences.

Implementing these ideas will not be easy or quick. In the US, higher education faces many of the same problems that it does in Ukraine: decreasing budgets, increasing class sizes and faculty teaching loads, and so on. The humanization of technical and scientific and technical education through writing instruction will result in significant benefits for the students. If any readers of this piece are interested in further exploring these ideas together, I invite them to contact me by e-mail at pzemliansky@ucf.edu.

Works Cited

1. *Bean, John C.* Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom. Jossey-Bass, 2011.

2. Downs, Douglas, and Elizabeth Wardle. "Teaching about Writing, Righting Misconceptions:(Re) envisioning" First-Year Composition" as" Introduction to Writing Studies"." College Composition and Communication (2007): 552-584.

3. *Zemliansky, PA. V. E. L.* "Achieving Experiential Cross-cultural Training T.