SECTION XI.
SCIENCES PEDAGOGIQUES

DEVELOPMENT OF FUTURE ENGINEERS' PROFESSIONAL COMMUNICATIVE COMPETENCE   AT ESP CLASSES

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The study of pedagogical conditions of professional training of future software engineers at a technical university has proved that the most important for the it is the integration of the content of mathematical, foreign language, social and humanitarian, professional training of future software engineers; encouraging students to acquire knowledge, skills and abilities, and developing personal qualities which are important for the professional activity of a software engineer; the use of a dual approach aimed at improving the quality of training of future software engineers based on the university's cooperation with IT companies. The efficiency of these conditions was experimentally tested and confirmed [1]. After the experiment, the biggest changes occurred in the students' level of the ability to develop software product and the ability to test software product. The students' level of communication skills has changed the least and, as the research showed, their development may require additional efforts.

In order to determine the positive or negative students' assessments regarding their professional training in higher education, a questionnaire was conducted among the students of "Software Engineering" direction at NTU "KhPI". The survey was conducted among the students of the 5th-6th years of study, obtaining the Master's degree and having experience in the chosen specialty. And if 71% of students were satisfied with the quality of professional training in the chosen specialty, none of the respondents thought that it should be changed radically. But at the same time, students realize the lack of some aspects in professional training. Namely, a large number of students surveyed (63%) believe that it is very important for them to develop professional communication skills at the university, which would greatly improve their integration into the professional environment.

The analysis of the curricula and syllabi of the departments which prepare future software engineers showed that they do not provide courses that are directly

focused on the development of professional communicative competence. The role of foreign language for special purposes is often underestimated, but the integration of English content for special academic purposes (ESAP) and professional training, which involves not only professional learning of English, but also the use of language as a means of developing professional knowledge, skills, abilities, qualities, values of students, can be the solution to this problem [2].

The need for foreign language proficiency in any field of study is beyond doubt, especially when it comes to programmers. But how can a foreign language be transformed into an integral part of a person's professional competence from the category of a general human culture?

From 2014 to 2019, the Department of Foreign Languages of NTU "KPI" took an active part in the project "English for Universities". Due to the participation in the project, there have been dramatic changes in the teaching of English. The new curricula and syllabi have been changed so that they are now based on the communicative needs of the modern engineer; in particular, the Bachelor's course in English (1st-2nd years of study, 124 academic hours) was modified in accordance with the professional needs of future specialists, which were reflected in the following modules:

1) Communication in an academic and professional environment;
2) Information search and analysis;
3) Information presentation;
4) Employment procedure.

It is obligatory to plan and adjust the content of the classes and the way of learning the language, taking into account students' opinions. Online students surveys are periodically carried out to assess their achievements and to express language learning preferences. In addition, there is a detailed analysis of curricula of various specialties regarding students' needs to acquire the necessary professional competences (PCs) and demonstration of their learning outcomes (LOs). That means that so-called needs analysis of both students and institutions of higher education is conducted.

The analysis of the curriculum for "Software Engineering" showed that professional competencies which could be directly developed by future software engineers during a foreign language course are **PC-1** (the ability to analyze subject areas (domains), formulate requirements, identify, classify and describe the tasks, find methods and approaches to solve them); **PC-4 (**the ability to apply and develop fundamental and interdisciplinary knowledge to successfully solve software engineering tasks); **PC-1** (the ability to formulate and meet the requirements); **PC-5 (**the ability to prepare and present software documentation and manuals).

Besides, the analysis of curriculum learning outcomes revealed that those directly related to ESP learning are **LO -1** (the ability to know and have language skills, ability to communicate in a professional-level dialogue with colleagues and subject matter experts); **LO-2** (the ability to demonstrate processes and results of professional activity, developing presentations, reports); **LO-1** (the ability to use information and communication technologies in communication, exchange, collection, analysis, processing the information); **LO-3** (the ability to understand, analyze, purposefully seek and select the necessary information resources and knowledge essential for solving professional tasks, taking into account modern achievements of science and technology); **LO-6** (the ability to have skills for

participating in team development, coordination, design and release of all types of program documentation).

Based on the results of the analysis, each of the above mentioned competencies and learning outcomes has been considered within one of four modules during which these competencies may be acquired. Thus, **PC-1** is mainly developed when studying Module 2 "Information Search and Processing", where almost all types of learning speech activity are focused precisely on the ability to analyze, compare, find causality and describe them through appropriate language tools and structures; **PC-4** demonstrates the ability of a future software engineer to use foreign language (which is the material of all four modules) to successfully solve software engineering tasks; **PC-1** is the ability to formulate and provide requirements i.e. the ability to formulate an opinion and formulate it in the form of instructions and requirements, or as a description; PC-5 is the ability to prepare and present software documentation and manuals.

The first and more general **LO-1** is accumulated through all four modules, in the form of teaching monologic and dialogic speech, namely in the presentation of themselves as a specialist, dialogic speech in the simulation of skirmish situations, while modeling speech situations related to travel and business trips (Module 1), while verbally commenting on visual means of reflecting processes and trends (Module 2), while presenting the results of the chosen research topic and answering questions (Module 3), while analyzing Soft and Hard skills required for work in the chosen specialty, modeling situations with an employer and interviews at the selected vacancy (Module 4).

The result of training **LO-2** is achieved during Module 3, when students are taught the art of presenting the results of their work. With regard to reading professional-oriented literature, this type of teaching is done in order to understand the basic ideas, to find the necessary information, to determine the purpose of the publication. Full text translation is excluded from the language learning tasks in the new program. In order to acquire skills that directly demonstrate **LO-3** and **LO-1** skills, within Module 2 "Search and processing of information" students are taught such types of reading as scanning and skimming, which is an integral part of the professional future of a student of any profession, and especially of future software engineers, also they learn to critically analyze the readings, make reports, describe any graphical information, such as charts, tables, graphs.

To provide students with the maximum opportunity to practice using language in the classroom, such teaching methods as pair work and group work, brainstorming, project work, etc. are used. The grammatical aspects are covered as needed, not as a separate part of the lessons. Mostly, authentic text materials and textbooks are used in classes and for independent work. Listening is an integral part of every class.

All these provisions are basic for training future specialists in any engineering specialty, including the specificity of each of them. The program was designed in such a way that the priority task in teaching English was the formation of professional competencies aimed at the practical use of English as a tool for the realization of professional interests.

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DIGITALIZATION AS INEVITABLE VECTOR OF THE EDUCATIONAL SYSTEM DEVELOPMENT IN GERMANY

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The implantation of modern digital technologies requires a completely new rethinking of the functioning and vectors of the development of school education, because until now our ideas about education have been based on the norms and values of the twentieth century. In this way, teachers are continuing to prepare students for the tasks of the past, rather than for the new changing challenges of the present and future.

Digitization is fundamentally changing our existence at all levels – everyday life, professional level, educational grounding. Just one glance at the unrestrained development of artificial intelligence makes it clear what awaits us in the near future. It is estimated that in the next 20 years, more than fifty professions (logisticians, notaries, realtors, secretaries, analysts, etc.) will disappear, and more than 200 new ones will appear, of which we have no idea yet. Educators are already facing the challenge of defining educational goals for children who were born after 2015. In 2-3 years, the modern Digital Generation will be replaced by next-generation which is called Children of Smartphones, Google Babies, Generation Zen or Generation Alpha.

Industry 4.0 has had a significant impact on the educational environment, making blockchain technology, artificial intelligence, cloud technology, the Internet of Things, and gamification an integral part of the modern educational process.

In Germany, policy makers are increasingly focusing on digital skills every year. In 2017, 68% of reported Germans answered that they had at least basic digital skills (these results were equal to the results of the previous year's inquest), ranking Germany seventh among EU Member States (EU average of 57%) [1]. In the European Commission Report Volume 2 of the Education and Training Monitor 2018 (Germany) it is noted that the political attention to digitalisation, including infrastructure and skills, is high, with a newly established post of state minister for digitisation. For schools, the DigitalPakt Schule, announced in 2016, was endorsed by the new government. It stipulates that the federal government will invest EUR 5 billion in digital infrastructure in schools within the next 5 years. The federal states will in return provide necessary teacher training and curricula updates [2].

Various federal states initiatives are aimed at enhancing the sustainable professional development of teachers' digital skills, which surveyed teachers found to be inadequate according to a digital education survey. Both German teachers