

# The Development of Academic Master (student) Competence in “Design Engineering and Technology of Electronic Aids”

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This article describes the development of academic master (student) competence in design engineering and technology of electronic aids. One effective variant in organizing the academic training of Master students in a technical university is suggested.

**Key words:** the scientific-pedagogical competences, preparation of magisters in technical college, scientific-pedagogical preparation of magisters.



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Only an advanced instructor (teacher) could solve the contemporary problem of today- training a new generation of engineers, research personnel and academic staff, who would implement a stable and dynamic competitive promotion (advancement) of the country's economy. Such an instructor (teacher) should have the following skills and knowledge: competence proficiency in his/her content area, methodological and project management approach, research and innovation-based experience, innovative educational technology strategies, moral and ethic principles, professional communication skills, good command of IT skills, and continuous improvement of one's professional level.

Based on the analysis and compilation of information [2, 3, 4] in training the academic staff for higher professional technical education, the following requirements were defined:

- high professional competence including in-depth and versatile knowledge in one's research-academic content area, unconventional creative mentality, innova-

- tion strategy and technique skills, creative problem-solving methods;
- pedagogical competence including basic knowledge of pedagogy and psychology and medic-biological intelligence aspects, command of contemporary learning forms, methods, tools and technology;
- social-economic competence including knowledge of the global civilization process development and modern society mechanism as well as a basic knowledge of sociology, economics, management and jurisprudence;
- communicative competence including academic and written communication skills, foreign language proficiency and IT skills, substantial knowledge of the approaches and methods in interpersonal communication;
- high professional and personal culture, i. e. scientific ideology, stable intellectual, moral, cultural and other values, not only as national but also as human ones.

Today's acute issue is the problem of training technical institution academ-

ic staff in accordance with up-to-date requirements, whereas classical universities and pedagogical universities do not train such instructors (teachers) in areas of basic professional and specific content. At the same time, these high requirements to the professional competence of the new generation academic staff and changed socio-economic conditions elaborate and expand future problems within the training frame of technical institution teaching staff.

The introduction of multi-level higher education system (Bachelor's-Master's programs) involves the possibility of training the academic staff within the framework of the technical universities. According to the new education concept, master students should be qualified for high-performance research and pedagogical activities in different areas. In view of these factors, the effective organization of the pedagogical training of master students in a technical university to implement professional-pedagogical activities furthers the solution of above-mentioned problems.

The academic activity tasks of the master students in design engineering and technology of electronic aids, stated in the project third-generation document "Federal State Education Standard of Higher Professional Education" are the following:

- conducting labs and tutorial classes with students;
- supervising term projects and Bachelor graduate papers;
- designing student teaching materials in different courses.

Federal State Education Standard for Master's degree in "Design engineering and technology of electronic aids" does not involve a core psychologic-pedagogical curriculum [4], and, in some cases, the training of master students as instructors (teachers) in technical disciplines includes only teaching internship.

S.I. Dvoretzki, E.I. Muratova, et al [1] considered several approaches in the organization of the academic training of master students in engineering and technology (Figure 1).

It is considered that the implementation of in-depth psychologic-pedagogical training of master students in a technical university influences not only the development of all training factors for their future teaching activities but also is a pedagogical requirement in developing the academic competence of master students in a technical university.

An organization model of academic training of master students in "Design engineering and technology of electronic aids" is depicted in Figure 2.

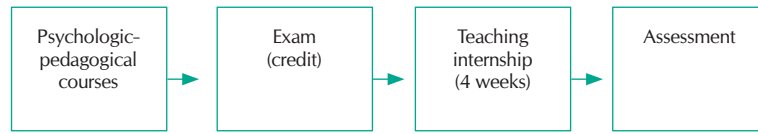
It is presumed that the academic training organization of master students in a technical university involves a systematic approach and special teaching process management:

- orientated development strategy in accordance to HR policy to develop an innovative training system for instructors (teachers);
- pedagogical training target towards a functional pedagogical model for technical university instructors (teachers) and developing basic principles of project management and teaching;
- organization of academic training as an integrated part of the professional pedagogical training of technical university instructors (teachers), based on those problem-solving tasks specific for this or that engineering university;
- performance of master students in the teaching process should be considered only as academic-research, being systematic and continuous within the master degree program framework and is the first bridging stage in the continuous structure of technical university instructor (teacher) education.

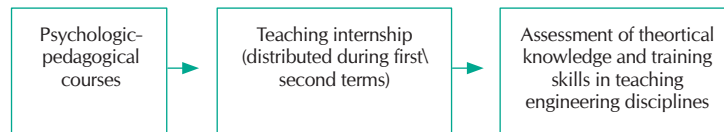
Thus, the academic competence development of master students in "Design engineering and technology of electronic aids" is implemented within the orientated professional academic training, including an integrated (theoretical and training) part and involving not only physico-pedagogical but also socio-humanitarian programs (modules).

**Figure 1. Different approaches in the organization of the academic training of master students in engineering and technology**

Approach 1



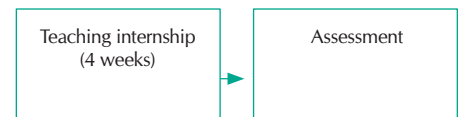
Approach 2



Approach 3

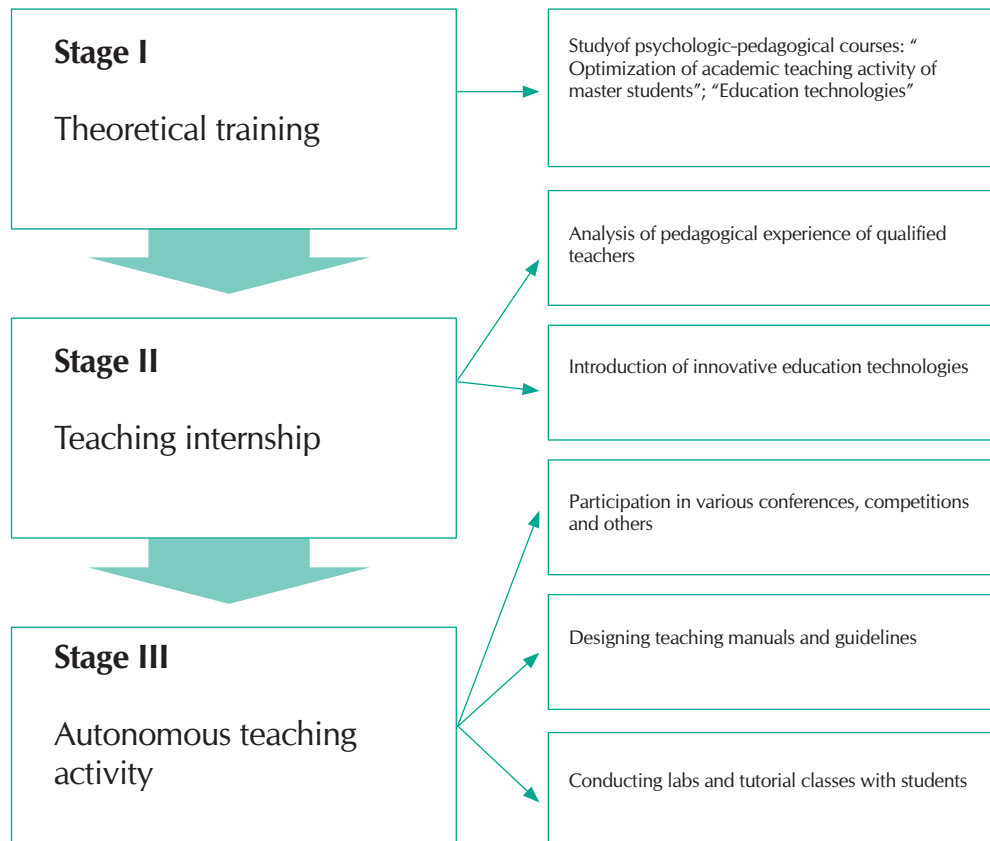


Approach 4



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**Figure 2. Organization of the academic training of master students in “Design engineering and technology of electronic aids”**



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