

RESEARCH ARTICLE

A Competency-Based Approach as A Leading Direction in Modern Engineer Training

Jamolov Shahboz

Senior lecturer at the Department of Higher Mathematics at Karshi State Technical University, Uzbekistan

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Abstract

This article outlines the priority tasks involved in developing and applying approaches that help young people studying in technical fields at higher education institutions become modern engineers through a competency-based approach. In particular, as the competency-based approach is becoming increasingly widespread in pedagogical science today, the branches of competence are also expanding and developing. In the field of engineering, it is considered important to introduce and widely implement the professional and scientific aspects of competence in the educational process in order to help students express themselves and acquire the skills necessary to master relevant modern knowledge through a competency-based approach in the training of modern engineers.

KEYWORDS

Competence, social-personal competencies, social competencies, general professional competencies, economic competencies, professional-labor competence, systemic competence, engineering and organizational skills.

INTRODUCTION

Today, real prospects for radically renewing the quality of professional training in modern technical higher education institutions are opening up through the establishment of a new competency-based approach in pedagogy when designing educational systems.

This approach emerged in response to the need to improve the efficiency and quality of training graduates of higher education institutions, as a real alternative to the paradigm of knowledge, skills, and abilities. Within this approach, the concept of "competence and competency" is viewed as an educational outcome consisting of motivational-moral and cognitive-content components.

"Competency" (Lat. *competens*, *competentis* — appropriate, capable) means being knowledgeable and informed in a particular field; a person who, based on their knowledge or

authority, has the right to carry out, resolve, or make judgments about something.

LITERATURE REVIEW

At present, the competency-based approach is gaining more and more supporters in pedagogical science. D. V. Puzankov, B. A. Sazonov, A. Ya. Savelyev and others propose including the following competencies in higher education graduates [1]:

Social-personal competencies: these are competencies related to a person's abilities as an individual (as a subject of activity and as a personality), social competencies, and learning ability.

General professional competencies: informational, computational, operational, managerial-organizational, design, project, and economic competencies. These

competencies are common to many professions and ensure flexibility in the labor market.

Special competencies (professional-functional knowledge and skills): these are connected with a particular object or subject of labor and specify general professional competencies in a more concrete way.

In the works of pedagogical scholars, different aspects and definitions of competency have been identified, which makes it possible to study this phenomenon more deeply from a pedagogical point of view [2].

S. E. Shishov defines competency as follows [3]:

A general ability based on knowledge, experience, values, and inclinations acquired through education;

The ability to establish a connection between knowledge and a situation, "to find an appropriate method for solving a problem" (it is worth speaking about competency only when it is manifested in a particular situation; hidden competency is not yet competency, at most it remains a latent possibility) [3].

According to L. M. Dolgova and P. V. Simonov, competency is the ability to act on the basis of acquired knowledge. Unlike knowledge, skills, and habits, competency implies the experience of independent activity based on learned knowledge [4]. Competency is also defined as the ability to apply universal methods of activity based on scientific ideas and principles and to use a system of knowledge [4]. In this way, the research component of competency acquires special significance.

A. Yu. Petrov, while carrying out a general analysis of the phenomenology and content of key competencies, divides them into three main groups:

Social competence, which consists of many components: socio-civic, socio-communicative, informational, socio-individual, and other competencies;

Professional-labor competence, which includes components specific to each type of professional activity;

Systemic competence, which is an integrated ability for independent learning activity in professional, personal, and social life, and which may also be manifested through several partial competencies in special fields [5].

METHODOLOGY AND DISCUSSION

In general, the competency-based approach is being formed as a new concept of activity in the field of education and is regarded as a new methodological and holistic direction for the development of education.

Alongside the concept of competency, the category of "key skills" is also often used as its synonym. B. Oskarsson defines key skills as follows: "These are personal and interpersonal qualities, abilities, skills, and knowledge that are manifested in various forms and situations in work and social life" [6].

In order to distinguish the general from the individual, it is appropriate to differentiate between such near-synonymous concepts as "competence" and "competency":

Competence includes the knowledge, skills, abilities, and methods of activity necessary for an individual to perform effectively and qualitatively within the framework of certain subjects and processes.

Competency means a person's possession of the relevant competence and includes their personal attitude toward it as well as toward the subject of activity [6].

These concepts should be distinguished as follows: competence is a predetermined requirement imposed on a student's preparation, whereas competency is a formed personal quality.

As emphasized in UNESCO materials, there is a range of competencies that should be considered by all as educational outcomes. In the report of the International Commission on Education for the Twenty-First Century, Jacques Delors identified the "four pillars of education": "learning to know, learning to do, learning to live together, and learning to be" [6]. Through this, he essentially identified the core global competencies. According to Jacques Delors, one of them is expressed as follows: "not only acquiring professional qualifications, but also forming competence in the broader sense, including the ability to cope with different situations and to work in a team" [6].

The competency-based approach, above all, implies not merely "equipping" a person with knowledge or developing certain abilities and qualities in the educational process, but preparing them to apply acquired knowledge in practice and to use these abilities and qualities in various life situations. Thus, the purpose of education is not only to develop a person, but also to help them successfully realize themselves in a modern, highly complex, organized post-industrial society.

At the same time, the main challenge facing educational organizers is not simply the selection of knowledge that a student must acquire or the personal qualities that must be developed, but rather the choice of the spheres in which educational outcomes can be applied, that is, the identification of the key competencies that are important in a person's "beyond-education" social and professional activities. According to the "Strategy," these competencies should include the following [7]:

Competence in the field of independent learning activity, based on mastering methods of acquiring knowledge from various external and extracurricular sources;

Competence in the field of civic and social activity, including the performance of such roles as citizen, voter, and consumer;

Competence in the field of social and labor activity, including the analysis of the labor market situation, assessment of one's professional opportunities, understanding the norms and ethics of relationships, and self-organization skills;

Competence in the domestic sphere, including health care, family life, and other aspects;

Competence in the field of cultural and leisure activity, including the choice of ways to spend free time and the methods of personal cultural and spiritual enrichment.

Taking into account the requirements placed on engineering specialties, the professional characteristics include the following:

Qualities expressing one's attitude toward work: diligence, attentiveness to work, and a creative approach;

Qualities determining behavior and style of activity: responsibility, independence, faithfulness to one's word, authority, and energy;

Knowledge: technical knowledge in one's specialty, mathematical knowledge, general culture, and awareness of the enterprise's activities, tasks, and plans;

Intellectual qualities: flexibility, erudition, ingenuity, systemic and original thinking, reflection, and developed imagination;

Engineering and organizational skills: the ability to solve technical problems, skills in working with literature, the ability to identify a problem, the ability to learn how to work, orientation in work, experience, the implementation of technical policy, cooperation with other departments, the ability to explain a technical issue, and the ability to plan work;

Administrative and organizational qualities: the ability to create a working environment, manage people, protect the team, understand people, and persuade them;

Qualities determining attitudes toward other people: honesty, objectivity, and politeness;

Qualities determining attitudes toward oneself: self-discipline, self-confidence, and striving for perfection [7].

CONCLUSION

Thus, the fundamental principle is postulated that the educational process in higher education institutions works with a developing personality, that is, with a person who already exists and is in the process of developing their essential powers in time and space. From this point of view, education, especially its higher stage, appears as the field and process of entering into the experience of finding one's own social and professional "self," as a process of constructing oneself through acquiring the necessary competencies.

Unlike other approaches such as personal, activity-oriented, subject-subject, and others, the competency-based approach organically combines personal and individual needs with the demands of society in the form of key competencies, including professional activity, social order, culture, and so forth, that is, social educational needs. Within the framework of other approaches, a division or contradiction between these two development dimensions is often observed, while their unity is, at best, assumed only conditionally or is not taken into account at all.

REFERENCES

1. Sh.Q. Farmonov, R.I. Turgunbayev, L. Sharipova, N.T. Parpiyeva "Ehtimolliklar nazariyasi va matematik statistika", darslik, Tosh; 2007-y. 200.b.
2. Abduqodirov.A.A. "Axborot texnologiyalari". – T.: O'qituvchi, 2002. – 133 b.
3. Yuldashev.U.R, Boqiyev.R.,Zokirova F.I "INFORIATIKA" Toshkent. 2002 yil.
4. Xodjamqulov.U.N. "Pedagogik ta'lim klasteri ilmiy pedagogik muammo sifatida (Pedagogik ta'limni klasterlashtirish zarurati)" Zamonaviy ta'lim 2019 yil.
5. Sh.J.Jamolov. "Mexanika va muhandislik geometriyasini amaliy muommolari va yechimlari" xalqaro anjuman; Buxoro davlat texnika universiteti. 1225-1231 b.

- 6.** Ochilova G.O., Akbarova S.Sh. Kasbiy kompetentlik. (Darslik). - T.: "Innovatsion rivojlanish nashriyot-matbaa uyi", 2022. 324 bet.
- 7.** R.Sh.Sariyev, MUHANDISLIK FANLARINI O'QITISHDA ILMIY TUSHUNCHALARNI SHAKILLANTIRISHNING AHAMIYATI. Studencheskiy vestnik , (2021) (17-8), 46-47.
- 8.** R.Sh.Sariyev, IJODIY LOYIHALASHNI ORGATISHDA ZAMONAVIY VA TAKOMILLASHGAN METODLARDAN FOYDALANISHNING NAZARIY ASOSLARI. Xalqaro ilmiy jurnal tadqiqot markazining hamkor konferentsiyalarida (2025 yil, dekabr). (1-jild, №1, 1053-1057-betlar).
- 9.** Sh.J.Jamolov BO'LAJAK MUHANDIS-TEXNOLOGLARNI KASBIY KOMPETENTLIGINI RIVOJLANTIRISH. GulDU Gumanitar – ijtimoiy fanlar seriyasi, 2025. № 4, 60-62.b.
- 10.** Sh.J.Jamolov "Bo'lajak texnologlarning kasbiy kompetensiyasini shakllantirish tizimi" PEDAGOGIK MAHORAT Ilmiy-nazariy va metodik jurnal 2023, № 1, 82-86.b