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PH.D. TRAINING PROGRAMS IN THE FEDERAL REPUBLIC OF GERMANY

Abstract. The paper considers the types of Ph.D. training programs in the Federal Republic of Germany: individual doctoral programs, which provide for earning the degree in industrial companies, universities, non-university research institutions (institutions of Fraunhofer, Helmholtz, Leibniz, Max Planck Societies), and structured doctoral programs that involve working on research in groups of doctoral students formed in research, postgraduate, doctoral schools. The

research studies the general principles of developing structured doctoral training programs: the availability of the critical mass of students who earn the degree in this program (at least 30 people); clear formalization of the training system (transparency of the admission procedures; system for assessing a doctoral student's achievements, which is clear and acceptable to the scientific community; regulated rules of interaction of a doctoral student, his or her supervisor, the university, etc.), and suchlike. The advantages of each type of Ph.D. training have been determined. The biggest advantages of individual doctoral programs include the possibility to freely choose the research topic, to study under the supervision of a certain professor; those of structured doctoral study programs are short-term training, funding, being supervised by several professors, teamwork, which provides an opportunity to share views with other team members, supervisors. Among the disadvantages of individual Ph.D. training programs, the following issues have been identified: the long period of study, highly specialized subject of study, independent study of the material. For structured doctoral programs, these are multilevel admission procedures, compliance of the Ph.D. dissertation topic with the doctoral program, overloaded curriculum.

Keywords: Federal Republic of Germany; higher education; individual doctoral studies; structured doctoral studies; PhD degree; research institutions.

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ПРОГРАМИ ПІДГОТОВКИ ДОКТОРІВ ФІЛОСОФІЇ У ФЕДЕРАТИВНІЙ РЕСПУБЛІЦІ НІМЕЧЧИНА

Анотація. У статті розглянуто види програм підготовки докторів філософії у Федеративній Республіці Німеччина: індивідуальні докторські програми, науковий ступінь за якими можна здобути у промислових компаніях, університетах, неуніверситетських дослідницьких закладах (інститути товариств ім. Фраунхофера, Гельмгольца, Лейбніца, Макса Планка та ін.), і структуровані докторські програми, що передбачають роботу над дослідженнями у групах докторантів, сформованих у науково-дослідних, післядипломних, докторських школах. У розвідці досліджено загальні принципи побудови структурованих докторських програм: наявність «критичної маси» студентів, які здобувають науковий ступінь за цією програмою (не менше 30 осіб); чітка формалізація системи підготовки (прозорість процедури прийому; система оцінки результатів роботи докторанта, яка буде зрозуміла і прийнятна для наукового співтовариства; регламентовані правила взаємодії докторанта, наукового керівника, університету та ін.) тощо. Визначено переваги кожного виду програм підготовки докторів філософії. До найбільших переваг індивідуальних докторських програм належать можливість вільно обирати предмет дослідження, навчатися під керівництвом певного професора; структурованих докторських програм –

короткий термін навчання, фінансування, керівництво декількома викладачами, команда робота, що надає можливість обмінюватися думками з іншими членами команди, науковими керівниками. Серед недоліків індивідуальних програм підготовки докторів філософії виокремлено тривалий термін навчання, надто спеціалізований предмет дослідження, самостійне опрацювання матеріалу; структурованих докторських програм – багаторівнева процедура вступу, відповідність теми дисертації докторській програмі, перенасиченість програми навчання.

Ключові слова: *Федеративна Республіка Німеччина; вища освіта; індивідуальна докторська програма; структурована докторська програма; науковий ступінь доктор філософії; дослідницькі заклади.*

Problem statement and its rationale. The Ukrainian higher education system has presently undergone significant reforms, which are seen as a necessity on the way to the integration into the European and global academic and scientific communities. Ukrainian educators have prepared and implemented a regulatory, social and legal framework that has introduced the principles of the Bologna Process to Bachelor and Master programs and enabled Ukrainian universities to actively pursue a policy of internationalization of higher education by establishing student academic mobility. However, the development and implementation of Ph.D. training programs in various fields of knowledge in accordance with the European standards requires further study.

Unfortunately, the quality of research, technical and educational potential of Ukrainian higher education institutions does not meet European standards, there is a shortage in cooperation between our universities and their foreign partners that would be based on the implementation of complex innovative projects and programs. According to the strategy of reforming higher education in Ukraine for the period 2014-2019, the important legal documents aimed at solving the problem of integration of national education and science into the European research area were adopted and put into action, but no systematic measures have been taken yet to increase young researchers' motivation to conduct joint research with foreign partners and most of the requirements for research activities performed by universities remain financially and organizationally unmet.

Thus, the study of best practices in developing and practical implementing of Ph.D. training programs in German universities should provide an opportunity to use leading foreign experience to intensify European integration processes in higher education in Ukraine. It should also be noted that obtaining a Ph.D. through the training programs agreed with partner universities should give young Ukrainian researchers a chance to obtain a double doctorate and make a successful international career.

The expediency of referring to the practices of the Federal Republic of Germany is predetermined by the number of international doctoral students studying in this country. Germany has long been one of the most popular places to study abroad. For the recent decades, it has been a leader in Europe in the number of Ph.D. dissertations defended by foreign candidates. Every year about 29,000 young researchers earn their Ph.D. degrees in Germany, of which 5.5

thousand are foreign graduates (Research in Germany, URL). These figures are much higher than in any other European country. The German doctoral degree is highly valued worldwide. The popularity of Germany among those seeking international Ph.D. degree results from its global reputation as a world leader in technical innovations and research, government and public attention to research and innovation, high standards of academic integrity that guarantee the uniqueness of curricula and research activities. The country also has a wide range of research areas, excellent research facilities and a variety of degree programs. Another distinctive factor is that it provides an opportunity to conduct research at one or more different universities, non-university institutions, businesses and government institutions.

Moreover, intensive industrial research functions as a system for promoting cooperation between scientific institutions and industry, making German business one of the most dynamically involved in research among other European countries. All this significantly increases the prospects for funding research and further employment of Ph.D. students directly in the field of their specialization.

Analysis of the recent publications. The specifics of obtaining a doctoral education in European countries have long been in the focus of scientific interests. The study of various models of Ph.D. training in Germany and analysis of the advantages and disadvantages of these models were carried out by M. Merkt (2008). The analysis conducted made it possible to identify weak points and outline a number of tasks for university didactic centers within the framework of the Bologna educational structures. The issues of differentiation of universities according to the structure of doctoral studies were dealt with by U. Senger (2011). The conducted studies show that the institutional position, structural and organizational development, as well as the concept of developing young researchers largely depend on university's specific educational profiles. In Ukraine, good practices of training doctoral students in national academic systems were in the focus of the following scientists: Borova T.A. (2017), Panytch O.I. (2017). The ways to reform postgraduate education in Ukraine and the obstacle on the way of introducing Ph.D. training programs were reviewed by Vynnytskyi M. (2015).

So, **the purpose of the paper** is to review the types of Ph.D. training programs in the Federal Republic of Germany and to identify their advantages and disadvantages. While studying the organization and implementation of Ph.D. training programs in the Federal Republic of Germany, the main research methods we applied were the analysis of the reference sources, the comparative analyses and the descriptive method.

Presentation of the basic material. In the German science infrastructure, there are two models for earning a degree. The most common and 'traditional' way is to take a degree during individual doctoral study. (German – Individualpromotion). Most doctoral students opt for this path. Within the framework of individual doctoral training programs, young researchers have to personally find a supervisor before they start working on their dissertation and work on it independently under his or her supervision (Panytch, 2017). The topic

of research is discussed with the supervisor. This type of Ph.D. training program does not require compulsory class attendance, deadlines, or a rigid curriculum, but calls for significant personal initiative, discipline and responsibility, and provides for academic freedoms and space for creativity. This so-called supervision model is acceptable for those who want to complete their postgraduate studies under the supervision of a specific expert. The period of this kind of doctoral study depends on independent time planning and usually lasts from three to five years.

The degree within an individual doctoral training program can be taken at universities, non-university research institutions, and industrial companies (Promovieren in Deutschland, URL). In Germany, Ph.D. students usually teach at universities or work on projects engaging the best young researchers. Such activities involve close professional communication with professors, as well as excellent opportunities for careers in science. This type of program is called an internal doctoral program (German – interne Promotion) (Promovieren in Deutschland, URL).

However, doctoral students do not have to work at a university. They can work on their dissertations independently at home supervised by a research advisor and with funding for research. This is called an external doctoral program (German – externe Promotion). This type of training program indicates that the doctoral student does not work at a university and is not involved in a project. He or she only works with the research supervisor, i.e. they can sometimes meet with one or communicate via e-mail. The Ph.D. student may receive a scholarship from one of the German foundations or work as a lawyer, civil engineer, etc., or does not work at all. It should be noted that within academic freedoms there is a possibility to transfer from one mode of study to another.

Non-university research institutions such as the institutes of the Fraunhofer Society (German – Fraunhofer-Gesellschaft), Helmholtz Association (German – Helmholtz-Gemeinschaft), Leibniz Association (German – Leibniz-Gemeinschaft) and Max Planck Society (German – Max-Planck-Gesellschaft) in collaboration with universities offer to take a Ph.D. degree while working on research projects [5]. It should be stated that the Helmholtz Society alone consists of 16 research institutes with 8,000 employees and has an average annual budget of 2.8 billion Euros. The Max Planck Society has 76 institutes, 17 graduates of which have received the Nobel Prize. A doctoral student becomes an employee of the institute and in cooperation with its industrial partners works on a research project. The Ph.D. project is supervised by a professor from a partner university. This type of doctoral study program gives an opportunity to combine work and study at postgraduate school, as well as gain practical experience (Promovieren in Deutschland, URL).

Another mode of individual doctoral study is to earn a degree in industry or business. Many German industrial companies, in cooperation with universities and research institutions, set up their own research institutes to attract researchers through doctoral programs. A doctoral student writes a Ph.D. dissertation under the supervision of a professor in collaboration with the company in which he or she works. The employer provides full financial support

during the work on a dissertation by concluding temporary or part-time employment contracts with doctoral students. This model allows young researchers to gain professional experience and establish useful contacts (Senger, 2011, 32).

Recently, taking a degree in Germany within the structured doctoral programs, which involve conducting research in groups of doctoral students formed in research / postgraduate / doctoral schools. These programs are similar to the Anglo-Saxon Ph.D. system, often internationally oriented, have a clear structure and are subject to a specific action plan. In Germany, there are about 600 such programs, mostly in English as the language of instruction.

Unlike individual doctoral programs, structured ones have a curriculum; all the research doctoral students conduct has to correspond to the areas of the programs within which they are conducted. While studying in a structured doctoral program, the applicant receives a scholarship from the university, his or her activities are supervised by a research team. Through the systematic and intensive supervision, the doctoral dissertation can be defended within three years (Research in Germany, URL).

Structured doctoral programs are developed on the general principles, which include:

1. The availability of a 'critical mass' of students studying in a doctoral program (it is considered that the number of participants in the program should be at least 30 people).

2. Clear formalization of the training system:

- - transparency of the admission procedures;
- - system for assessing a doctoral student's achievements, which is clear and acceptable to the scientific community;
- - regulated rules of interaction of a doctoral student, his or her supervisor, the university, etc.

3. Structured programs should be based on flexible intra-university, inter-university or international structures, as such there are doctoral (research) schools organized on a problem-disciplinary basis.

In EU countries, structured Ph.D. training programs at universities consist of:

- obligatory attending by doctoral students of special courses related to scientific activities (research skills) (research methodology; specialized seminars, courses, discussions, etc. – in their specialty);
- forming related skills and developing individual abilities (transferable skills) (communication skills (teaching, presentation techniques, etc.); developing scientific texts and preparing publications; scientific writing in English);
- conducting qualitative research and preparing a dissertation for defense before a specially convened council (not necessarily a permanent one and/or the composition of which is approved by the state) (Vynnytskyi, 2015, URL).

Having considered the specific features of individual and structured doctoral training programs, we can identify their advantages and disadvantages (table 1).

Table 1

**Advantages and disadvantages
of individual and structured doctoral programs**

	Individual doctoral programs	Structured doctoral programs
Advantages	Provide Ph.D. students with the opportunity to independently integrate the results of their research	Term of study – usually 3 years
	Opportunity to conduct research under the supervision of a certain professor	Supervision is carried out by several university professors
	Freedom in choosing the topic of dissertation	Much attention is given to teamwork and applied aspects of the research. Working together on a project provides an opportunity to share views with other team members and supervisors
		The matter of funding is solved when enrolling in the program
		A number of benefits for international degree seekers throughout the postgraduate study cycle
Disadvantages	Term of study – 4–5 years	Multilevel procedure for enrolling in the program
	The subject of the dissertation is usually too specialized and poorly integrated into the research framework	Overloaded curriculum
	Independent seeking of financing by a postgraduate student researcher to conduct research	Compliance of the dissertation topic with the program, which often makes it impossible to choose one's own subject of interest
	Necessity to work independently on the research material	

Accordingly, in the German scientific system there are two ways to earn a Ph.D. degree:

- under an individual doctoral program (at universities, non-university research institutions, in industry (industrial companies));
- under a structured doctoral program (working in groups of doctoral students in research / postgraduate / doctoral schools).

Conclusions and prospects for further research. As one can see from the study, the advantages of individual doctoral programs include the ability to freely choose the subject of the dissertation, independently integrate the results of one's research, study under the supervision of a certain professor. Among the advantages of structured doctoral programs there is a short period of study, working under the supervision of several professors, teamwork, funding and more. The biggest disadvantages of individual doctoral programs include a long

period of study, a very specialized dissertation subject, personal searching for funding to conduct research, independent study of the material. Multilevel admission procedure, compliance of the dissertation topic with the doctoral training program, overloaded curriculum are the disadvantages of structured doctoral programs. The outcomes of the presented study may be used for upgrading and improving the existing Ph.D. training programs in Ukraine.

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