BIOETHICAL COMPETENCE AS AN INTEGRAL COMPONENT OF FUTURE BIOTECHNOLOGISTS' PROFESSIONAL TRAINING

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Today, biotechnology has become a significant factor in the development of science and society. With the development of new technologies in the field of biology, complex ethical issues arise that require deep discussion and regulation. Today the development of biotechnology is one of the main areas of scientific and technological progress. Biotechnology is becoming an integral part of all spheres of life. However, all achievements in this field of science should be based on noosphere thinking, ethical values, protection of an individual from the negative effects of the use of biotechnology. Analysis and philosophical understanding of the history of formation and development of biogenous technologies have been conducted by such scientists, as J. Rossou, S. Svetlov, L. Sidorenko, V. Soifer, P. Tishchenko, L. Udovika, O. Chumak, Y. Habermas, J. Fayndhold, F. Fukuyama, H. Shumberh, B. Yudin and others.

They tried to analyze the nature and the importance of biotechnology in human life in detail. They emphasize that despite the enormous possibilities of biotechnology to help people in difficult environmental situation its development is unpredictable.

Bioethical competence refers to the capability and proficiency of individuals to understand, analyze, and address ethical issues and dilemmas that arise in the fields of biology and biotechnology. It encompasses the knowledge of fundamental ethical principles, critical thinking skills to assess complex ethical situations, and the ability to make well-informed and ethically justified decisions in professional practice and research [6]. Bioethical competence also involves considering the broader societal and environmental implications of biotechnological advancements and ensuring responsible and ethical conduct in scientific endeavors. This competence is essential for professionals to navigate the ethical complexities inherent in their work and contribute to the ethical and sustainable advancement of biological and biotechnological sciences.

In recent years, new educational courses "Fundamentals of biosafety and bioethics" and "Bioethics" have been introduced in higher educational institutions of Ukraine, which have the status of elective or mandatory courses in the process of training future biotechnologists, agrarians, lawyers, philosophers, social workers, and other specialists. In many countries of the world, bioethics has become an academic discipline. It is obvious that the bioethical education of future specialists is an urgent social task, the solution of which will allow to significantly expand the boundaries of professional competence of students, to change their attitude to the field of future work. The introduction of specialized training courses on bioethics in the curricula of biotechnology faculties will allow students to gain basic knowledge about ethical principles and issues related to their future professional activities.

Therefore, for master’s students who master the biotechnology specialty, taking into account the specifics of their specialty, for the development of bioethical competence, a specialized curriculum in bioethics can be used.

The curriculum typically includes a combination of theoretical knowledge, practical skills, and critical thinking exercises to foster a deep understanding of the

ethical challenges and implications in the realm of biological sciences. The key components of a bioethics specialized curriculum may include:

1. Fundamentals of Bioethics. An introductory course covering the fundamental principles, theories, and frameworks of bioethics. Students learn about autonomy, beneficence, non-maleficence, justice, and other ethical principles relevant to biology and biotechnology.

2. Ethical Issues in Biotechnology. A course that examines the ethical dilemmas and implications arising from biotechnological innovations such as gene editing, cloning, genetic testing, and stem cell research. Students explore the ethical considerations of these technologies in healthcare, agriculture, and environmental conservation.

3. Biomedical Ethics. This course delves into the ethical aspects of medical practice and research. It covers topics such as informed consent, end-of-life care, organ transplantation, and reproductive technologies.

4. Environmental Ethics. A module focused on ethical questions related to environmental conservation and sustainability. Students explore the ethical dimensions of biodiversity conservation, climate change, and the impact of biotechnological interventions on ecosystems.

5. Research Ethics. This segment familiarizes students with the ethical principles governing research involving human participants, animals, and data. Topics include research integrity, informed consent, ethical review processes, and responsible conduct in research.

6. Genetics and Ethics. A course that investigates the ethical considerations surrounding human genetics, genetic counseling, and genetic testing. Students examine the ethical implications of genetic information in various contexts.

7. Policy and Regulation in Bioethics. An exploration of the ethical aspects of policy development and regulation in biotechnology. Students learn about the role of ethics committees, regulatory bodies, and the process of ethical policy formation.

8. Case Studies and Ethical Analysis. Students engage in ethical case studies and discussions, analyzing real-world ethical dilemmas faced by professionals in biology and biotechnology. This fosters practical skills in ethical analysis and decision-making.

9. Interdisciplinary Approaches. The curriculum may encourage interdisciplinary approaches by incorporating courses or seminars that engage with other fields like philosophy, law, sociology, or public health, enriching the understanding of bioethical issues from various perspectives.

10. Practical Experience and Internships. Some specialized programs offer opportunities for students to gain practical experience through internships, where they apply bioethical principles in real-world settings, such as hospitals, research institutions, or non-profit organizations.

A well-designed bioethics specialized curriculum equips students with the knowledge, skills, and ethical awareness necessary to critically engage with the ethical challenges and responsibilities associated with advancements in biotechnology and biology. Graduates of such programs are prepared to make informed, ethical decisions and contribute responsibly to the advancement of science and technology for the betterment of society.

In the course of mastering the course "Bioethics" in the curricula of biotechnology faculties, various teaching methods are used to engage students, encourage critical thinking, and promote active learning. These methods aim to help students understand and analyze complex ethical issues in the context of biotechnology and biology.

Through specialized curricula and innovative teaching methods, universities can create an environment where future biotechnologists engage in critical discussions and ethical analyses. Case studies, debates, and ethical dilemma exercises encourage students to think critically about the ethical implications of biotechnological advancements. Group discussions and interdisciplinary approaches enrich their understanding by considering diverse perspectives and societal values.

As biotechnologists, these professionals hold the key to groundbreaking discoveries and advancements that have the potential to revolutionize human well-

being and the environment. However, with this immense power comes the responsibility to use it ethically and responsibly. Bioethical competence serves as a guiding light, illuminating the ethical pathway in an ever-evolving field where new challenges emerge continuously.

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