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DEVELOPMENT OF CREATIVE COMPETENCE OF FUTURE SPECIALISTS IN BIOCHEMISTRY LESSONS

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Abstract

In the modern educational landscape, fostering creative competence has become essential for preparing students to address complex, real-world problems. This paper explores methods for developing creative competence in biochemistry lessons for future specialists, addressing both theoretical foundations and practical applications. This research is rooted in the premise that creativity in scientific fields, such as biochemistry, enhances problem-solving skills, fosters innovation, and equips students with critical thinking abilities necessary in their professional lives.

Keywords: biochemistry, medical education, digital technology, molecular modeling, virtual laboratories, online assessments.

Introduction

Overview of Creative Competence: Define creative competence and its importance in modern science education. This might include skills like problem-solving, critical thinking, and the ability to innovate within complex biological systems. Creative competence is increasingly valued in science education, especially in disciplines like biochemistry, which require analytical and innovative thinking. Previous research has highlighted the role of creativity in enhancing students' engagement and deepening their understanding of scientific concepts. However, few studies specifically address the methods for cultivating creative competence within biochemistry education.

Creative competence is increasingly recognized as a crucial skill set in modern science education, especially within disciplines like biochemistry that demand high levels of analytical and innovative thinking. Defined as the ability to approach problems in original ways, synthesize information across disciplines, and develop new solutions, creative competence enables students to adapt to complex, unpredictable challenges in both academic and real-world settings. In biochemistry,

this competence is not only valuable but essential, as the field is inherently interdisciplinary, bridging chemistry, biology, and often medicine. Creative competence in educational contexts can be defined as the ability to approach problems with innovative and critical thinking, integrating both theoretical and applied knowledge In biochemistry, creative thinking enables students to generate novel hypotheses, conduct original research, and apply biochemical principles in unique ways.

Methods for Developing Creative Competence in Biochemistry

To develop creative competence in biochemistry lessons, educators can adopt various strategies, including:

1. Project-Based Learning (PBL): PBL encourages students to explore biochemistry topics through collaborative projects that require problem-solving and experimentation.
2. Interdisciplinary Approaches: Integrating biochemistry with related fields such as molecular biology and pharmacology promotes creativity by providing broader perspectives and encouraging innovative thinking.
3. Digital Simulations and Virtual Labs: Leveraging technology, such as interactive simulations and virtual lab environments, allows students to experiment safely and creatively, often encountering scenarios difficult to replicate in physical labs.

In the biochemistry classroom, fostering creative competence can occur through:

Inquiry-Based Learning (IBL): Where students actively explore scientific questions, designing experiments and drawing conclusions based on observations. For instance, students might investigate enzyme kinetics in practical scenarios, learning to adjust variables to observe outcomes—a process that develops both technical skills and creative problem-solving abilities.

Problem-Based Learning (PBL): Problem-based approaches encourage students to address real-life clinical cases or biochemical problems with open-ended solutions. By grappling with case studies that involve biochemical mechanisms of disease, students learn to devise original solutions, an approach that mirrors real-life scenarios where solutions are not predefined.

Case Study: Application of Creative Methods in Biochemistry

A recent study involved implementing PBL and digital labs in biochemistry courses for medical students. The results demonstrated a significant increase in student

engagement and creative problem-solving abilities, indicating the effectiveness of these methods in fostering creative competence. Integrating creativity-enhancing methods in biochemistry education does more than just improve students' biochemical knowledge; it equips them with versatile problem-solving skills essential for their future roles in healthcare, research, and industry. Such an approach aligns with the broader educational goal of producing adaptable and innovative professionals.

Conclusion

The importance of fostering creative competence in biochemistry education extends beyond academic achievement. In the Uzbek educational context, this competence aligns with broader objectives to equip future medical and scientific professionals with skills that support healthcare and scientific innovation. By embedding creativity within biochemistry lessons, educators prepare students not only for the complexities of biochemical research but also for meaningful contributions to health science—contributions that ultimately benefit society by enhancing the quality and accessibility of healthcare. The development of creative competence in biochemistry lessons is crucial for preparing future specialists to thrive in complex professional environments. The use of PBL, interdisciplinary learning, and digital technologies can effectively foster creativity, making biochemistry education both relevant and engaging for students.

References

1.Chen, Y., Zhang, T., & Liu, M. (2019). Impact of virtual labs on creative thinking in biochemistry education. Journal of Educational Technology, 56(4), 251-265.
2.Johnson, R. (2020). The role of interdisciplinary approaches in developing creative competencies in science education. International Journal of Science and Education, 32(2), 101-117.
3.Lee, S. (2018). Cultivating creative competence in higher education: A comparative study. Journal of Innovative Teaching, 11(3), 45-63.
4.Martinez, L., & Garcia, M. (2022). Project-based learning in biochemistry: Enhancing creative thinking. Biochemistry Education Journal, 24(1), 97-112.

5.Olsen, R., Hayes, L., & Jordan, S. (2021). Engaging students through creative methods in biochemistry. Science Education Research Journal, 15(2), 80-95.
6.Smith, J., & Smith, L. (2020). Creative competence in the science classroom: A meta-analysis. Science Education, 54(5), 490-515.
7.Zhou, X., Li, F., & Wang, Y. (2021). Defining creative competence: Implications for science education. Creativity Studies, 20(1), 55-74.
8. Mamadaliyeva Z.R. Tibbiyot oliy ta'lim muassasalarida localhost dasturi asosida biokimyo fanini virtual laboratoriyalardan foydalanib o'qitish // The role of exact sciences the era of modern development. Nukus. Vol.1 №.1, 2023. p. 47-51. https://uzresearchers.com/index.php/RESMD/article/view/765/703
9..Мамадалиева З.Р. Виртуал лаборатория ишларидан ўкув сифатиниошириш элементи сифатида фойдаланиш. // "Ilmiy tadqiqotlar, innovatsiyalar, nazariy va amaliy strategiyalar tadqiqi" respublika ko'p tarmoqli, ilmiy konferensiya. Andijan. №9, 2023. -Б. 108-111. https://ojs.rmasav.com/index.php/ojs/issue/view/28/45