FORMATION OF KEY GRAPHIC COMPETENCIES RELATED TO INTERDISCIPLINARY TEACHING PRINCIPLES

ФОРМУВАННЯ КЛЮЧОВИХ ГРАФІЧНИХ КОМПЕТЕНЦІЙ, ПОВ'ЯЗАНИХ З МІЖДИСЦИПЛІНАРНИМИ ПРИНЦИПАМИ НАВЧАННЯ

UDC 378.12
DOI https://doi.org/10.32782/2663-6085/2025/82.1.13

Brednyova V.P.,
Candidate of Technical Sciences, PhD, Professor at the Department of Descriptive Geometry and Engineer Graphic, Architectural and Art Institute Odessa State Academy of Civil Engineering and Architecture

Prokhorets I.M.,
Senior Lecturer at the Department of Drawing, Painting and Architectural Graphics, Architectural and Art Institute Odessa State Academy of Civil Engineering and Architecture

Increased requirements to the quality of education in higher education institutions are directly related to the need to achieve results in priority areas of science and technology development. Nowadays, the ability of complex application of knowledge and individual competencies, as well as comparison and transfer of ideas and methods from one discipline to another is of great importance, which is an urgent task for Higher Education Institutions (HEI). In recent years, the range of tasks that can be solved using graphic methods has significantly expanded, which is why the role and significance of graphic disciplines, which lay the foundations of both spatial representation and the formation of key graphic competencies, has increased accordingly. In this regard, increasing the motivation and interest of students throughout the entire educational process at the HEI, awareness of the need to obtain a high-quality graphic education, which is the key to success in future professional activities, is of current and important importance.The article examines the issues of using interdisciplinary approaches and interdisciplinary integration in teaching graphic disciplines to students of creative and technical specialties. The aim of the study is to generalize the author's many years of experience in teaching graphic disciplines to junior students of architectural and civil engineering specialties, as well as pre-university graphic training of applicants with an emphasis on taking into account interdisciplinary connections. Expert assessments and a comparative method of content analysis, systematic field observations of the educational process, and analytical specific results from scientific and methodological literature sources were used as experimental research methods. The search for improving interdisciplinary approaches will continue in the future, which is associated with an in-depth study of the interdisciplinary features of teaching graphic disciplines among students of different specialties of higher educational institutions.
Key words: *interdisciplinary connections, key graphic competencies, junior students of architectural and construction specialties disciplines.*

Підвищення вимог до якості освіти у вузах безпосередньо пов'язане з необхідністю досягнення результатів за пріоритетними напрямками розвитку науки та техніки. На сучасному етапі вміння комплексно застосовувати знання та індивідуальні компетенції, а також порівнювати та переносити ідеї та методи з однієї дисципліни до іншої має велике значення, що є актуальним завданням для закладів вищої освіти (ЗВО). Протягом останніх років помітно поширилось коло задач, які можна розв'язувати графічними методами, тому відповідно підвищена роль і значущість графічних дисциплін, що закладають як основи просторового уявлення, так і формування ключових графічних компетенцій. У зв'язку з цим актуальне і важливе значення приймає підвищення вмотивованості та зацікавленості студентів протягом всього навчально-виховного процесу у ЗВО, усвідомлення необхідності здобуття якісної графічної освіти, що є запорукою успішності у майбутній професійній діяльності. У статті розглядаються питання використання міждисциплінарних підходів та міждисциплінарної інтеграції у навчанні графічних дисциплін студентів творчих та технічних спеціальностей. Метою цього дослідження є узагальнення багаторічного авторського досвіду викладання графічних дисциплін студентам молодших курсів архітектурних та будівельних спеціальностей, а також довузівської графічної підготовки абітурієнтів з орієнтацією обліку міждисциплінарних зв'язків. Як експериментальні методи дослідження в статті використовувалися експертні оцінки та порівняльний метод контент-аналізу, систематичні натурні спостереження за навчальним процесом, аналітичні конкретні результати з науково-методичних літературних джерел. Пошук удосконалення міждисциплінарних підходів буде продовжено й надалі, що пов'язано із поглибленим вивченням міждисциплінарних особливостей викладання графічних дисциплін студентам різних спеціальностей вищих навчальних закладів.
Ключові слова: *міждисциплінарні зв'язки, ключові графічні компетенції, студенти молодших курсів архітектурних і будівельних спеціальностей.*

Problem statement. Interdisciplinary integration is a combination of theoretical knowledge and practical skills at all stages of training a specialist in a higher educational institution. In this sense, from our point of view, some aspects of professional graphic training of students in creative and construction specialties play an important role. Effective development of visual culture in future specialists can be realized only in conditions of high-quality establishment of interdisciplinary connections in the pedagogical process. Students must be familiar with methods that are used in other sciences and traditionally are outside the professional subject area.

Analysis of recent research and publications. In the scientific literature there are a number of studies devoted to the problem of interdisciplinary education of students of creative and technical specialties of higher educational institutions at the present stage. approaches [1, 103-113; 3, 17-21; 4, 354-360; 6, 60-68; 9, 326-331; 12, 317-325; 13, etc.]. As the analysis of many recent studies shows, the features of the methodological teaching of graphic disciplines based on the competency-based approach by

different teachers are quite diverse [2, 202-205; 5, 110-116; 11, 175-180, etc.]. From our point of view, of particular interest were those works that examined issues of mutual collaboration between a teacher and a motivated student to improve his professional key competencies [7, 122-126; 8, 215-227; 10, 36-47; 17, 175-180, etc.].

Purpose of the article. The aim of the study is to generalize the author's many years of experience in teaching graphic disciplines to junior students of architectural and civil engineering specialties, as well as pre-university graphic training of applicants with an emphasis on taking into account interdisciplinary connections.

Main material. The peculiarities of the graphic cycle disciplines are that the work is not done with objects, but with their flat images – projections. In order to complete a particular task, the student must constantly mentally imagine the image of the object, relying on its flat image.representations. Solving problems and completing graphic assignments require students to have developed spatial, logical and algorithmic thinking, knowledge of the geometric properties of simple figures and surfaces, and skills in geometric constructions using a compass and ruler. Unfortunately, the number of teaching hours for studying graphic disciplines is decreasing every year, but the requirements for the formation and quality of students' professional competencies are increasing. It is possible to emphasize the opinion of scientists that interdisciplinary interrelation as a didactic condition for improving competencies plays a significant role in the development of creative thinking and graphic skills.

Interdisciplinary connections are a set of any mutual connections between sections and individual topics of different disciplines. Interdisciplinary and interdisciplinary connections can be defined as synonyms in the sense that an academic discipline and an academic subject are also synonyms, so in our work we have joined the same opinion.

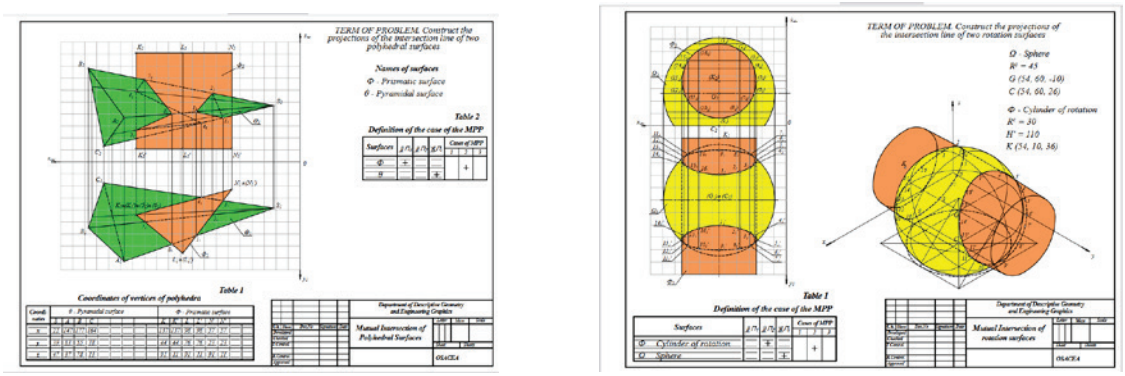
In this study of key graphic competencies of students and the influence of interdisciplinary integration on these characteristics, the empirical base consisted of students of the Architectural and Art Institute and the Civil Engineering Institute (AAI and CEI), as well as applicants – students of the Preparatory Courses of the Odessa State Academy of Civil Engineering and Architecture (OSACEA) in the amount of 282. The analysis of the authors' long-term work shows that first-year students' academic performance in graphic disciplines is not high enough, especially in the first semester. The main reason is the low level of school graphic training in drawing. A survey of students revealed that 82% of respondents had not studied drawing at school. Preparatory courses are an important stage in preparing applicants for study at higher educational institutions, since the tasks performed have a logical continuation in the educational process for junior students. Applicants studying in preparatory courses are usually given the task of developing their individual spatial concepts, mastering artistic and graphic skills in the application of artistic expression in various types of fine art (drawing, drawing, composition, still life) and acquiring high-quality graphic skills.

At the Department of Descriptive Geometry and Engineering Graphics of O OSACEA, students of architectural specialties study two disciplines: "Descriptive Geometry" and "Art of Font", and students of construction specialties – "Engineering Graphics". Descriptive Geometry is a basic discipline in architecture, art and engineering education. This is a unique tool for studying the characteristics and features of spatial objects in general. During training, students are given examples of solving individual problems using visual images, algorithms for solving typical problems. **Drw. 1** shows examples of completing classical graphic problems in the discipline "Descriptive Geometry" in the first semester. **Drw. 2** shows examples of completing individual creative graphic problems on the topic “Positional problems. Construction of projections of the line of mutual intersection of surfaces.”

In the discipline "Art of Font" students become familiar with the graphical features of the execution of various types of fonts: antique, Cyrillic, Gothic, Latin, etc., which is an integral part of their future specialization as an architect or artist. **Drw. 3** shows an example of completing a graphic assignment in the discipline “Art of Font” on the topic “Latin Font”

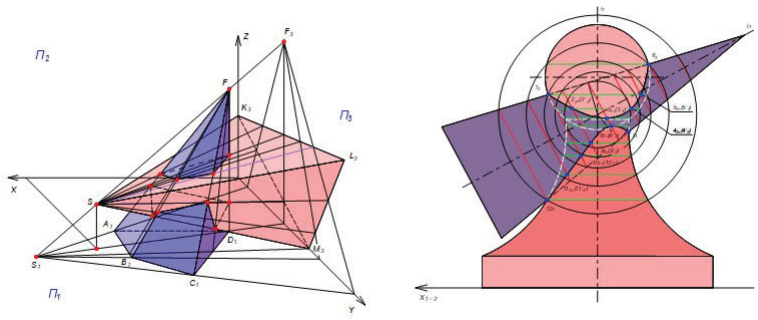
In the second semester, students study special sections of "Descriptive Geometry", namely: "Shadows in orthogonal projections. Perspective of architectural structures and individual fragments." Along with these topics, in other departments they simultaneously carry out projects of architectural structures, construct shadows and perspective images. In this way, students immediately learn the rules and patterns of theories, shadows and perspectives, and immediately find them in a separate department, which combines them into a single complex. This significantly increases the interest and motivation of students to study graphic disciplines, for example, more than 80% successfully defended their assignments on time.

The Department of Drawing, Painting and Architectural Graphics of the OSACEA teaches many graphic disciplines. Thus, in the course of studying the disciplines “Drawing and Painting”, ‘Composition’, and later “Coloristics”, students learn how to construct images of spatial objects on a plane, practice graphic skills in working with drawing tools, paints, brushes and other means, learn the rules for reconstructing the shape of an object using logical analysis and algorithms for graphic actions in solving any practical

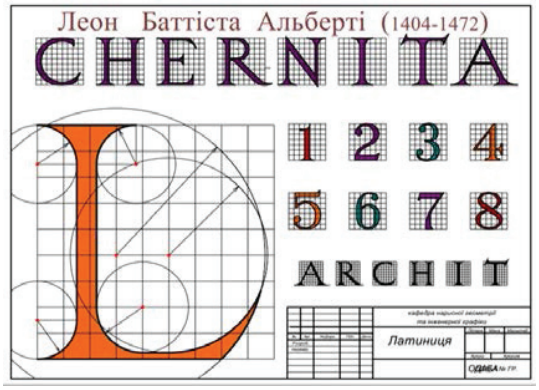


a) b)

Drw. 1. Examples of solutions to classical graphic problems in the discipline "Descriptive Geometry" in the first semester



Drw. 2. Examples of completing individual creative graphic tasks on the topic "Positional tasks. Construction of projections of the line of mutual intersection of surfaces"

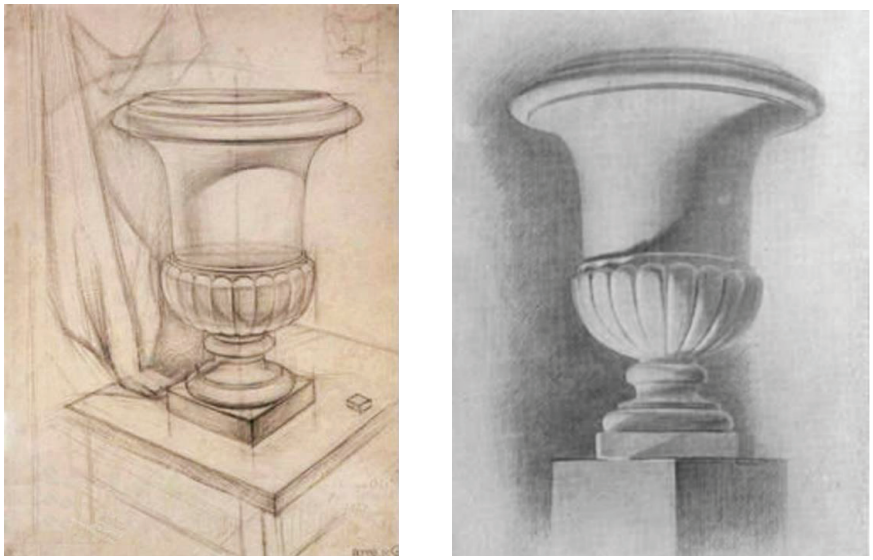


Drw. 3. An example of completing a graphic assignment in the discipline "Art of Font" on the topic "Latin Font"

problems. All this creates the basis for the development of sustainable graphic literacy and creative abilities in performing tasks in other disciplines, as well as in future professional specialties.

Conclusions. In conclusion, we emphasize that professional graphic knowledge is objectively necessary knowledge and skills that are required by the corresponding future practical activity. The competencies acquired at the university should allow the young specialist to immediately engage in active, productive work. Systematization of interdisciplinary connections in the process of studying graphic disciplines suggests their special role in education as a whole. In addition, the basic knowledge acquired by students will be strong if the learning process is creative and arouses interest in students. We see the prospect of further scientific research in the improvement of modern approaches to teaching graphic disciplines in related departments with broad discussion and debate.

a) b)



c) d)

Drw. 4. Complex contest task "Composition of letters. Building a perspective image"

REFERENCES:

1. Биркович Т.І., Варивончик А.В., Мазур Б.М. Особливості навчання студентів професійної майстерності в мистецьких закладах вищої освіти: *Питання культурології*. К.: 2021. №37. С. 103–113.

2. Bobek B. L.Teacher resiliency: a key to career longevity. *Journal of* Educational Strategies, Issues *and* Ideas. Athen: 2002. V. 75. С. 202–205.

3. Бредньова В.П., Смичковська О.М., Прохорец І.М. До проблеми формування графічних компетенцій студентів архітектурних і художніх спеціальностей. *Науковий вісник Південноукраїнського національного педагогічного університету імені К.Д. Ушинського. Сер. «Педагогічні науки»*. 2018. № 1(120). С. 17–21.

4. Brednyova V. Modern methodological means of teaching graphic disciplines for first-year students. *Регіональні проблеми архітектури та містобудування*. 2023. Вип. №17. Одеса, Астропрінт. С. 354–360.

5. Brednyova V.P., Prokhorets I.M., Yavorska N.M. Research of the Influence of Graphic Disciplines on the Education of Future Designers as the Basis of Professional Technical Literacy. Журнал наук. праць «*Інноваційна педагогіка*». 2024. №74. С. 110–116.

6. Brednyova V. Monitoring and criteria for the effectiveness of teaching graphic disciplines to junior courses students of creative and technical specialties. *Наукові проблеми архітектури та містобудування*. Зб. наук. праць. Одеса: 2024. Вип. 2. С. 60–68.

7. Brednyova V., Prokhorets I., Yavorska N. Research of feedback in the study of graphic disciplines in higher educational institutions. Журнал наукових праць «*Інноваційна педагогіка*» Причорноморського науково-дослідного інституту економіки та інновацій. 2024. № 67, т. 1. С. 122–126.

8. Brednyova V. Formation of graphic competences of first year architecture and art students. Зб. наук. праць «*Наукові проблеми архітектури та містобудування*». 2025. № 3. С. 215–227.

9. Воєвідко, Л.М. Складові професійної підготовки студентів мистецьких спеціальностей: *Педагогічна освіта: Теорія і практика*. 2015. №18. С. 326–331.

10. Коновець С.С. Особливості професійної підготовки викладачів образотворчого мистецтва у вищих

навчальних закладах. *Вісник Львівської національної академії мистецтв*. Львів. 2011. № 22. С. 36–47.

11. Осередчук О. Модель моніторингу якості вищої освіти в Україні. *Витоки педагогічної майстерності*. Львів: 2022. № 29. С. 175–180.

12. Ткачук О.В., Бредньова В.П., Смичковська О.М. Міжпредметні зв'язки дисциплін образотворчого циклу із графічними. Сумський державний педагогічний університет імені О.С. Макаренка. Зб. наук. праць "*Педагогічні науки: теорія, історія, інноваційні технології*". 2021. № 5 (109). С. 317–325.

13. Удосконалення методології викладання графічних дисциплін для студентів архітектурно-художніх і будівельних спеціальностей: монографія/ А.О. Перпері та ін. Одеса: ОДАБА, 2022. 181 с.