BINO VA INSHOOTLARNING AKUSTIK XUSUSIYATLARINI LOYIHALASH METODI ORQALI O‘TKAZISH USULI

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Annotatsiya
Maqolada texnika oliy ta’lim muassasalarida fizika fanidan amaliy mashg‘ulotlarni kasbiy faoliyat ob’ektlarini loyihalash metodi orqali o‘tkazish metodikasi ko‘rsatib o‘tilgan. Bunda, arxitektura va qurilish sohalari bo‘yicha mutaxassislar tayyorlashda loyihalash metodining o‘ziga hos xususiyatlari, tashkil etish bosqichlari va uning bevosita qo‘llanilishiga aniq misol keltirilgan.

Kalit so‘zlar: loyihalash metodi, fizika fani, fizika mashg‘ulotlari, kasbiy faoliyat obyektlari, akustik xususiyatlari, fanlararo integratsiya.

Texnika oliy ta’lim muassasalarida arxitektura va qurilish sohalari bo‘yicha mutaxassislarni tayyorlash bo‘yicha o‘quv jarayonining yaxlitligi fanlararo integratsiya aloqalari orqali erishiladi. O‘qitishning fanlararo yondashuvi talabalarga mustaqil ravishda fan va ishlab chiqarishning turli sohalaridagi bilimlarni olish, ularni guruhlash va muayyan kasbiy muammoni yechishga yo‘naltirishga imkon beradi. Bunday holda, kurslar va fanlar o‘rtasidagi chegaralar o‘zgaruvchan bo‘lib, bu talabalarga bilimlarning ajralmas tizimini shakllantirishga imkon beradi.

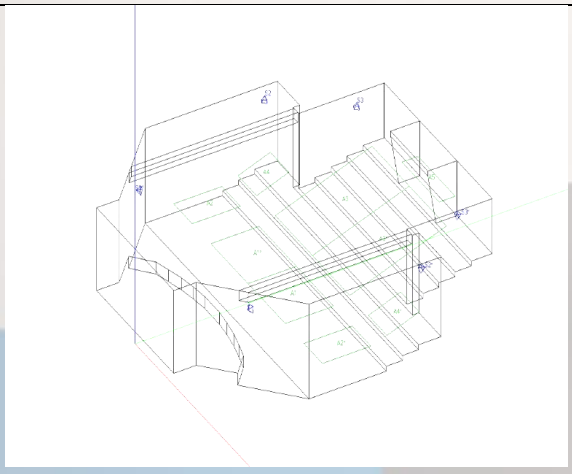
Fizika fanidan olingan bilimlarning tub mohiyati shuni nazarda tutadiki, texnika oliy ta’lim muassasalarida talabalar tomonidan fizika darslarida shakllanadigan bilimlar umumkasbiy fanlarni o‘rganishda, yangi texnika va texnologiyalarni o‘zlashtirish uchun asos yaratadi. Fizika kursining mazmuni talabalarning dunyoning zamonaviy fizik tasviri haqidagi g‘oyalarini shakllantirishga hissa qo‘shishi kerak. Bu holda fizik bilimlar yaxlitlashadi va o‘qitiladigan fanlarni fanlararo aloqalarga yo‘naltirilgan umumiy qurilish metodologiyasi birlashtiradi. Fizikadan o‘tkaziladigan mashg‘ulotlarda kasbiy faoliyat obyektlarini loyihalashtirish uslubini amalga oshirishning muvaffaqiyati tabiiy va umumkasbiy fanlari professor-o‘qituvchilarining o‘zaro hamkorligiga bog‘liq. Buni ta’minlash uchun fizika professor-o‘qituvchisi quyidagilar haqida aniq tasavvurga ega bo‘lishi kerak:

-umummuhandislik fanlarining fundamental asoslari mazmuni bilish;

-umummuhandislik fanlarida ishlatiladigan fizik qonunlarni, tushunchalarni, ta’riflarni to‘g‘ri talqin qilish.

Texnika oliy ta’lim muassasalari talabalariga fizika fanidan amaliy mashg‘ulotlarni loyihalash metodi orqali o‘tkazilishi, ularning bevosita arxitektura va qurilish sohalariga integtatsiyasini ta’minlaydi hamda kasbiy kompetentligini shakllantirishga asos yaratadi. Shuningdek,

loyihalash metodi natijasida fizikani umummuhandislik fanlariga integratsiyasi ta’minlanadi. Loyihalash metodi orqali bevosita qurilish sohalariga yo‘naltirilgan bino va inshootlarning mexanik, akustik, teplofizik, yorug‘lik xususiyatlarini hisoblashga doir amaliy masalalarning yechilishi quyidagi jadvallarda keltirilgan.

№	Umumiy usullarning amalga oshirilishi	Bajariladigan amallar
Bino va inshootlarning akustik xususiyatlarini hisoblash		
1.	Masalaning qo‘yilishi:	Ma’ruzachi tovush uskunasining quvvati $P=2\cdot10^{-5}$ W ga teng. Bunda, ma’ruzachi tovushining intensivligi va 10 metr masofadagi tovushining qattiqligini toping (1-rasm).
2.	Obyekt yoki uning alohida olingan elementlarini ajratib ko‘rsatish:	ma’ruza xonasi
3.	Ajratib olib qaralayotgan obyekt yoki uning alohida olingan elementlariga ta’sir qiluvchi tovushning ta’sir turlarini ajratish:	tovush bosimi, tovush intensivligi, tovushning qattiqligi.
4.	Tovushning tarqalishigi oid fizik hodisalarni ko‘rsatish:	tebranishlarning elastik muhitda tarqalishi
5.	Loyihalashtirilayotgan obyekt yoki uning alohida olingan elementlari tabiati modelini grafik tasvirlash.	 1.-rasm. Ma’ruza xonasida tovushning tarqalish tasviri.
6.	Qarab chiqilayotgan tovushning ta’sirini ifodalovchi fizik kattaliklarni aniqlash:	tovush to‘lqinining intensivligi, tovushning qattiqligi.
7.	Berilgan sharoitlarda obyekt yoki uning ayrim olingan elementlari tabiatini ifodalab beruvchi fizik qonuniyatlarni tavsiflash.	Tovush to‘lqini intensivligi: $I=\frac{P}{4\pi r^2}$ Tovushning qattiqligi: $L=10\lg\frac{I}{I_0}$ bu yerda, $I_0=10^{-12}\ W/m^2$
8.	Olingan tenglamalar sistemasini yechish va qidiralayotgan fizik kattaliklar qiymatlarini aniqlash:	$I=\frac{P}{4\pi r^2}=\frac{2\cdot10^{-5}}{4\cdot3{,}14\cdot10^2}=0{,}16\cdot10^{-7}\ \frac{W}{m^2}$

		$L = 10\lg\frac{I}{I_0} = 10\lg\frac{0{,}16 \cdot 10^{-7}}{10^{-12}} = 42$ dB.
9.	Loyihalashtirish qoidalariga va texnik shart-sharoitlarga mos keluvchi hisoblab topilgan kattaliklarni solishtirish:	hisoblab topilgan natijalar qurilish me'yor va qoidalariga mos keladi.
10.	Loyihalash faoliyati natijasida qaysi umummuhandislik fanlariga integratsiya ta'minlanadi:	qurilish fizikasi
11.	Loyihalash faoliyati natijasida shakllanadigan kompetentlik turlari:	maxsus kompetentlik

Loyihalash metodi orqali amaliy mashg'ulotlarni o'tkazilishi talabalarning fizika faniga bo'lgan qiziqishlarining yanada ortishiga, fanga doir bilimlarni yanada to'liq va chuqur egallashlarini hamda egallagan bilimlarni kasbiy faoliyatda mustaqil qo'llay olish ko'nikmalarini shakllantirishga e'tibor qaratilgan. Mazkur modelining yaratilishi va texnika oliy ta'lim muassasalariga joriy etilishi, fanning amaliy, laboratoriya mashg'ulotlarini o'tkazish hamda mustaqil ta'limda talabalarni ijodiy faollikka yo'naltirib, erishilgan bilim, ko'nikma va malakalarini yangi vaziyatlarda qo'llay olish, fizik hodisa va jarayonlari orasidagi o'zaro bog'lanish qonuniyatlarini bilishi, ularda loyiha va konstruktorlik ishlarini bajarishda eng maqbul usullarni taklif qilish ko'nikmalarining shakllanishiga imkon beradi.

References:

1. Begmatova D.A., Nortojiyev A.M., Khudayberdiyev S.S., Mahmadiyorov A.Z., Nosirov N.B. The importance of physical exercises in the training of specialists in the field of architecture and construction // International Conference on Problems and Perspectives of Modern Science. AIP Conference Proceedings 2432, 030056 (2022); https://doi.org/10.1063/5.0089959 Published Online: 16 June 2022.
2. Mukhamadalievich, N.A. (2022). The method of conducting practical classes in the subject of physics in technical higher educational institutions through the method of designing objects of professional activity. Asian Journal of Research in Social Sciences and Humanities, 12(5), 350-354.
3. Nortojiyev A.M. Teaching physics on the basis of integration of architecture and building sciences // International Conference on Developments in Education, Sciences and Humanities. – Hosted from Washington, DC USA, 2022. – P. 116-117.
4. Nortojiyev A.M. Methods of ensuring integrative approach to teaching physics // International Multidisciplinary Conference on Scientific Developments and Innovations in Education. - Greece, 2022. - P 19-21.

5. Nortojiev, A. (2023, June). Methods of formation of professional competence of students in teaching physics on the basis of integration of architecture and building sciences. In AIP Conference Proceedings (Vol. 2789, No. 1). AIP Publishing.
6. Нортожиев, А. М. (2023). ФИЗИКАНИ АРХИТЕКТУРА ВА ҚУРИЛИШ ФАНЛАРИГА ИНТЕГРАЦИЯСИ ОРҚАЛИ ТАЛАБАЛАРНИНГ КАСБИЙ КОМПЕТЕНЦИЯСИНИ ШАКЛЛАНТИРИШ. Ustozlar uchun, 16(1), 189-194.
7. E. B. Saitov., Sh. Kodirov., Z. F. Beknazarova., B. M. Kamanov., A. Nortojiyev., N. Siddikov. Developing Renewable Sources of Energy in Uzbekistan Renewable Energy Short Overview: Programs and Prospects. // International Conference on Problems and Perspectives of Modern Science. AIP Conference Proceedings 2432, 020015 (2022); https://doi.org/10.1063/5.0090438 Published Online: 16 June 2022.
8. Gareth Jones. "Competence and Understanding—A Personal Perspective" Selected Contributions from the International Conference Girep Epec 2015, Wroclaw Poland, 6–10 July 2015 u. P. 11-24.
9. Begmatova D.A., Nortojiyev A.M. Integration of conducting physics classes in higher educational institutions in the field of construction// Scientific information of Tashkent State Pedagogical University. - Tashkent, 2020. - 12. - B. 40-45.
10. Khudaiberdiev, S.S., Nortojiev, A.M. (2022). The method of conducting practical training in physics in technical higher education institutions through the design method. Journal of Integrated Education and Research, 1(7), 104-109.
11. KS Salievich, NA Mukhammalievich, NN Baratovich. PEDAGOGICAL ASPECTS OF PREPARING FUTURE ENGINEERS FOR PROFESSIONAL ACTIVITY. Ustozlar uchun 19 (2), 315-318.
12. Muhammadaliyevich, N. A. (2022, January). Methods of ensuring integrative approach to teaching physics. In Archive of Conferences (pp. 19-21).
13. Uralbaevich, T. I., Baratovich, N. N. (2023). Formation of main general competences of future engineers and its stages. Conference, 80-83.
14. Begmatova, D. A., Nortojiyev, A. M. (2020). Integrative approach in general physics, scientific-methodical journal "Physics. Mathematics and Informatics", Tashkent, (5), 28-33.
15. Mukhamadalievich, N.A. (2022). Formation of the professional competence of students through the interdisciplinary integration of physics into the sciences of architecture and construction. Conference, 170-172.
16. Nortojiyev, A.M., Begmatova, D.A. (2021). Methods of conducting physics laboratory courses on the basis of interdisciplinary integration. Academic research in educational sciences, 2(CSPI conference 3), 105-107.
17. Nortojiev, A.M. (2023). Formation of professional competence of students through integration of physics in architecture and construction sciences. For Teachers, 16(1), 189-194.

18. Худайбердиев, С.С., Нортожиев, А.М. (2022). Техника олий таълим муассасаларида физикадан амалий машғулотларни лойиҳалаш методи орқали ўтказиш усули. Journal of Integrated Education and Research, 1(7), 104-109.
19. Baratovich, N.N. (2023). A model for implementing professional orientation by future engineers in the general physics course. For Teachers, 16(1), 178-183.
20. Baratovich, N.N. (2023). Modeling method of professional competence development of future engineers. For Teachers, 16(1), 184-188.
21. Baratovich, N. N. (2023). THE STAGES OF SOLVING ENGINEERING PROBLEMS FROM PHYSICS AND ITS EDUCATIONAL AND METHODOLOGICAL SUPPORT. American Journal of Research in Humanities and Social Sciences, 13, 52-57.
22. Nosirov, N.B. (2022). Educational-methodical support for solving engineering problems from physics and its stages. Integration of science, education and practice. Scientific-methodical journal, 3(10), 98-103.
23. Baratovich, N. N. (2023). A model for ensuring consistency in solving physical problems.(On the example of engineering activity). Eurasian Scientific Herald, 21, 39-43.
24. Baratovich, N.N. (2023). Study and methodology of solving engineering problems in physics. Conference, 64-67.
25. Baratovich, N.N. (2023). Physical-engineering problems stages of solution and its didactive tasks. Conference, 102-104.
26. NA Muxamadaliyevich. THE ROLE OF PHYSICS COURSES IN THE TRAINING OF FUTURE CIVIL ENGINEERS. American Journal of Research in Humanities and Social Sciences 19, 23-29.
27. NN Abror Nortojiev. Methods of formation of professional competence of students in teaching physics on the basis of integration of architecture and building sciences. E3S Web of Conferences 7028 (1-6), 6.
28. НН Нортожиев А., Худайбердиев С. Педагогическая интеграция учебного знания с привлечением понятийно-терминологического аппарата. Проблемы и решения современной физике и астрономии, методы обучения” сборник.