

Bakalavriat yoʻnalishi talabalarida asosiy IT kompetensiyalarini shakllantirish

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Annotatsiya: Zamonaviy bakalavr sinfxonasi tobora raqamli jamiyatni boshqarish va shakllantirishga qodir boʻlgan keyingi avlod mutaxassislarini rivojlantirish uchun asosiy poydevor boʻlib xizmat qiladi. Bu vazifa tez eskirib borayotgan maʼlum dasturiy taʼminot paketlari yoki dasturlash tillarini vaqtinchalik oʻzlashtirishdan ancha uzoqqa choʻziladi. Buning oʻrniga, u butun axborot texnologiyalari landshaftini qoʻllab-quvvatlaydigan bardoshli, oʻtkazilishi mumkin boʻlgan va integrativ asosiy kompetensiyalarni rivojlantirishga qaratilgan diqqatni talab qiladi. Ushbu maqolada ushbu kompetensiyalarni samarali qurish kontentga yoʻnaltirilgan oʻqitishdan kompetensiyaga asoslangan, kontekstga boy tizimga pedagogik oʻtishni talab qilishi taʼkidlangan. Unda asosiy IT kompetensiyalarining asosiy ustunlari oʻrganiladi, bu nafaqat hisoblash fikrlashi va tizim tahlili kabi texnik qobiliyatlarni, balki axloqiy fikrlash, muloqot va hamkorlikdagi muammolarni hal qilish kabi muhim insonga yoʻnaltirilgan koʻnikmalarni ham qamrab oladi. Munozara nazariy abstraktsiyani haqiqiy qoʻllash bilan bogʻlaydigan oʻquv muhitlarini loyihalash, moslashuvchan tajribani rivojlantirishda metakognitsiyaning roli va oʻquv dasturiga professional identifikatsiyani shakllantirishni joriy etish zarurati kabi masalalarni chuqur oʻrganadi. Taʼlim nazariyasini pragmatik sinf strategiyalari bilan sintez qilish orqali ushbu maqola bakalavr IT sinfxonasini doimiy qobiliyatlar tizimli ravishda quriladigan, amalda qoʻllaniladigan va takomillashtiriladigan dinamik ekotizimga aylantirish uchun asos yaratadi.

Kalit soʻzlar: kompetensiyaga asoslangan taʼlim, axborot texnologiyalari oʻquv dasturi, bakalavriat pedagogikasi, tajribaviy oʻrganish, professional koʻnikmalar, moslashuvchan tajriba

Building Core IT Competencies in Undergraduate Students

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Abstract: The modern undergraduate classroom serves as a fundamental foundation for developing the next generation of professionals capable of managing and shaping an increasingly digital society. This task goes far beyond the temporary

mastery of certain software packages or programming languages that are rapidly becoming obsolete. Instead, it requires a focused focus on developing resilient, transferable, and integrative core competencies that support the entire information technology landscape. This article argues that effectively building these competencies requires a pedagogical shift from content-oriented instruction to a competency-based, context-rich system. It explores the key pillars of core IT competencies, which encompass not only technical skills such as computational thinking and systems analysis, but also important human-centered skills such as ethical reasoning, communication, and collaborative problem solving. The discussion will explore issues such as designing learning environments that connect theoretical abstraction with real-world application, the role of metacognition in developing adaptive experiences, and the need to incorporate professional identity formation into the curriculum. By synthesizing educational theory with pragmatic classroom strategies, this article provides a framework for transforming the undergraduate IT classroom into a dynamic ecosystem where ongoing competencies are systematically built, applied, and refined.

Keywords: competency-based learning, information technology curriculum, undergraduate pedagogy, experiential learning, professional skills, adaptive experiences

Kirish

Texnologik o'zgarishlarning tezligi axborot texnologiyalari bo'yicha bakalavrtalimi uchun chuqur qiyinchilik tug'diradi. Bugungi kunda talab yuqori bo'lgan vositalar asosida ishlab chiqilgan o'quv dasturi talabalar bitiruvga chiqqunga qadar ahamiyatsiz bo'lib qolishi mumkin. Bu haqiqat hozirgi emas, balki doimiy bo'lgan narsalarga tubdan qayta yo'naltirishni talab qiladi. Asosiy vazifa alohida texnologiyalarni o'qitishdan asosiy IT kompetensiyalarini - bitiruvchilarga butun faoliyati davomida o'rganish, moslashish va innovatsiya qilish imkonini beruvchi asosiy bilim, ko'nikma va moyilliklarni shakllantirishgacha rivojlanadi. Ushbu kompetensiyalar yangi, o'ziga xos texnologiyalarni samarali va samarali tushunish va o'zlashtirish uchun mustahkam poydevor bo'lib xizmat qiladi.

Kompetensiya tushunchasi oddiy ko'nikmalarni egallashdan ustun turadi. Kompetensiya bilim, ko'nikma va munosabatni murakkab, real vaziyatlarda samarali harakat qilish imkonini beradigan tarzda birlashtiradi. IT sohasida bu talaba Pythonda sikl yoza oladimi yoki yo'qmi degan savoldan tashqari, ular chalkash, noto'g'ri aniqlangan biznes muammosini hal qilish, algoritmik yechimni ishlab chiqish, uni mustahkam amalga oshirish, uning mantig'i va cheklovlarini manfaatdor tomonlarga yetkazish va uning axloqiy oqibatlarini ko'rib chiqish uchun hisoblash tafakkuridan foydalana oladimi yoki yo'qmi degan savolga o'tishni anglatadi. Shuning uchun, bakalavr sinfi ushbu ko'p qirrali kompetensiyalarni rivojlantirish va birlashtirish uchun

takroriy, mustahkam imkoniyatlarni taqdim etish uchun mo'ljallangan bo'lishi kerak. Bu texnik ta'limning avtomatik qo'shimcha mahsuloti emas; bu kompetensiyani rivojlantirishni uning markaziga qo'yadigan qasddan o'qitish dizayni natijasidir. Ushbu maqolada bunday ta'lim arxitekturasini o'rganiladi, asosiy IT kompetensiyalarining tarkibiy elementlari va ularni bakalavr dasturining vaqtinchalik va strukturaviy chegaralarida rivojlantirish uchun zarur bo'lgan pedagogik tamoyillar o'rganiladi.

Qurilish rejadan boshlanadi. Birinchi qadam texnik va professionalni muvozanatlashtiradigan asosiy IT kompetensiyalarining izchil doirasini shakllantirishdir. Ushbu tizim odatda bir nechta o'zaro bog'liq ustunlarga asoslanadi. Birinchisi, Hisoblash Fikrlashi va Algoritmik Muammolarni Yechishdir. Bu asosiy kompetensiya bo'lib, muammolarni mantiqiy ravishda ajratish, ahamiyatsiz tafsilotlarni mavhumlashtirish, naqshlarni aniqlash va hisoblash jarayonlariga tarjima qilinishi mumkin bo'lgan bosqichma-bosqich yechimlarni loyihalash qobiliyatini o'z ichiga oladi. Bu oddiy skript yozishdan tortib murakkab taqsimlangan tizimni arxitektura qilishgacha qo'llaniladigan o'ziga xos mahoratdan ko'ra ko'proq fikrlash tarzidir.

Ikkinchi ustun - tizimli fikrlash va tahlil. IT mutaxassislari kamdan-kam hollarda alohida komponentlar bilan ishlaydi. Ular murakkab ijtimoiy-texnik tizimlar - tarmoqlar, dasturiy ta'minot ekotizimlari, odamlar va texnologiyalarni birlashtirgan tashkiliy ish oqimlari bilan o'zaro ta'sir qiladi. Bu yerdagi kompetensiya komponentlarning qanday o'zaro bog'liqligi va o'zaro ta'sirini tushunishni, paydo bo'ladigan xususiyatlarni oldindan bilishni, muhosilalarni tahlil qilishni (masalan, samaradorlik va xavfsizlik, masshtablanish va narx) va tizim xatti-harakatlarini modellashtirishni o'z ichiga oladi. Bu kompetensiya talabalarni dasturchi bo'lishdan me'mor va tahlilchi bo'lishga olib boradi.

Uchinchi ustun - Texnik mahorat va moslashuvchan o'rganish. Muayyan tillar yo'qolib borayotgan bir paytda, ma'lumotlar tuzilmalari, tarmoq qatlamlari, ma'lumotlar bazasi dizayni va xavfsizlik tamoyillarining asosiy tushunchalari saqlanib qolmoqda. Kompetensiya ushbu sohalarni chuqur, kontseptual tushunishga erishishni, shuningdek, yangi vositalar, tillar yoki freymvorklarda tezda malakaga ega bo'lish qobiliyatini namoyish etishni o'z ichiga oladi. Bu IT sohasiga xos bo'lgan "o'rganishni o'rganish" meta-kompetensiyasi bo'lib, strategik axborot qidirish, texnologiyalar bo'ylab naqshlarni aniqlash va eksperimental prototiplash bilan tavsiflanadi.

Eng muhimi, to'rtinchi ustun Insonga yo'naltirilgan professional kompetensiyalarni o'z ichiga oladi. Bu texnik ishlarning insoniy kontekstda qimmatli va integratsiyalashgan bo'lishiga imkon beradigan ko'nikmalardir. Ular texnik va texnik bo'lmagan auditoriyalarga moslashtirilgan yozma va og'zaki aniq va ishonarli muloqotni; ko'pincha chaqqon yoki loyihaga asoslangan ish oqimlarini aks ettiruvchi

turli jamoalarda samarali hamkorlikni; ma'lumotlar, maxfiylik, algoritmik tarafdashlik va ijtimoiy ta'sirga nisbatan axloqiy mulohaza yuritish va professional mas'uliyatni; va loyihalarni boshqarish asoslarini o'z ichiga oladi. Texnik ko'nikmalarni rivojlantirishni ushbu professional kompetensiyalardan ajratish ko'plab dasturlarda jiddiy muvaffaqiyatsizlikka uchraydi, natijada bitiruvchilar tizimni qura oladilar, ammo uning qiymatini tushuntira olmaydilar yoki oqibatlarini tushuna olmaydilar.

Axborot uzatish bu murakkab kompetensiyalarni shakllantirish uchun yetarli emas. Ularning rivojlanishi faol, tajribaga asoslangan va aks ettiruvchi pedagogik arxitekturani talab qiladi. Uning asosida haqiqiy, loyihaga integratsiyalashgan o'rganish tamoyili yotadi. Kompetensiyalar eng yaxshisi alohida emas, balki kontekstda shakllantiriladi. Darslik diagrammasi orqali o'rganish tizimlarini tahlil qilish yangi a'zolik ma'lumotlar bazasiga muhtoj bo'lgan kampus klubi uchun talablar tahlilini o'tkazishdan tubdan farq qiladi. Simulyatsiya qilingan amaliy tadqiqotlar yoki real dunyo hamjamiyati hamkorligidan olingan haqiqiy loyihalar zarur murakkablik, noaniqlik va manfaatlarni ta'minlaydi. Ular kompetensiyalarni integratsiyalashni talab qiladi: jamoa muammoni tahlil qilishi (tizimli fikrlash), yechimni ishlab chiqishi (hisoblash fikrlashi), uni amalga oshirishi (texnik mahorat), ish jarayonini boshqarishi (hamkorlik), taklifini taqdim etishi (muloqot) va ma'lumotlarni qayta ishlash bo'yicha ko'rsatmalarni (etika) ko'rib chiqishi kerak. Loyiha kompetensiyalarni rivojlantirishning markaziy vositasiga aylanadi, ma'ruzalar, laboratoriyalar va o'quv qo'llanmalari loyihaning rivojlanishi talab qilganidek, zarur bilim va vositalarni taqdim etadigan qo'llab-quvvatlovchi, o'z vaqtida rolga o'tadi.

Ushbu tajriba yadrosi Qasddan Amaliyot va Iskala Murakkabligi doirasi bilan o'ralgan bo'lishi kerak. Kompetensiyani shakllantirish bitta tajriba emas, balki progressiv sayohatdir. O'quv dasturi spiral shaklida ishlab chiqilishi kerak, bunda asosiy kompetensiyalar bir nechta kurslarda tobora murakkablashib borayotgan darajada qayta ko'rib chiqiladi. Kirish kursi kichik, tor doiradagi individual dasturlash loyihasini o'z ichiga olishi mumkin. O'rta darajadagi kurs mijoz bilan jamoaviy loyihani o'z ichiga olishi mumkin. Keyin yakuniy kurs barcha oldingi o'rganishlarni birlashtirgan to'liq tizim hayot aylanishi loyihasini talab qiladi. Har bir bosqichda, talabalarning kompetensiyasi o'sib borishi bilan, masalan, taqdim etilgan kod doiralari, batafsil bosqichlar ro'yxati yoki tuzilgan jamoa shartnomalari kabi, iskala asta-sekin olib tashlanadi va mustaqillikni rivojlantiradi. Bu iskala juda muhim; u kognitiv ortiqcha yuklanishning oldini oladi va talabalarga boshqariladigan tuzilma doirasida o'z kompetensiyalarining aniq yangi jihatlarini rivojlantirishga e'tibor qaratish imkonini beradi.

Bu jarayonning ajralmas qismi metakognitsiya va refleksiv amaliyotni rivojlantirishdir. Talabalar o'z fikrlashlari va o'rganishlari haqida o'ylashga yo'naltirilishi kerak. Kompetensiyani rivojlantirish o'z-o'zini anglashni talab qiladi.

Talabalarni rivojlanish jurnallarini yuritishga, loyiha muammolari bo'yicha o'limdan keyingi mulohazalarni yozishga yoki jarayonga (nafaqat mahsulotga) qaratilgan tuzilgan tengdoshlar kodlarini ko'rib chiqishga undash ularni o'zini baholashga va o'zini tuzatishga o'rgatadi. Talaba nafaqat o'z yechimi muvaffaqiyatsiz bo'lganini, balki muammoni dekompozitsiyasi nima uchun nuqsonli bo'lganini yoki nosozliklarni tuzatish strategiyasi qanday samarasiz bo'lganini aniqlay olganda, ular moslashuvchan mutaxassisning o'ziga xos xususiyati bo'lgan metakognitiv ongini namoyish etadilar. Ushbu refleksiv qatlam tajribani chinakam o'rganish va ko'chma ko'nikmaga aylantiradi.

Baholash kompetensiyani shakllantirish maqsadiga tubdan mos kelishi kerak. U yakuniy qaror bo'lishdan to'xtaydi va uzluksiz fikr-mulohaza orqali o'sishning asosiy dvigateliga aylanadi. Formativ baholash keng tarqalgan va kam xavf ostida. U kod uslubi va funkcionalligi bo'yicha avtomatlashtirilgan fikr-mulohazalarni, dizayn hujjatlari bo'yicha o'qituvchilarning fikr-mulohazalarini, loyiha taqdimotlari bo'yicha tengdoshlarning fikr-mulohazalarini va kompetensiya rubrikalariga muvofiq o'zini baholashni o'z ichiga oladi. Maqsad diagnostika va rivojlanish bo'lib, o'quvchilarga yakuniy baho belgilanishidan ancha oldin ularning kompetensiya bosqichlariga erishish yo'lidagi yutuqlari haqida aniq, amaliy ma'lumot beradi.

Yakuniy baholash, qo'llanilganda, haqiqiy va kompetensiyaga yo'naltirilgan bo'lishi kerak. An'anaviy vaqtli imtihonlar ko'pincha tahlil qilish, loyihalash yoki hamkorlik qilish qobiliyatini o'lchay olmaydi. Portfolio baholashlari samaraliroq bo'lib, unda talabalar o'zlarining loyiha ishlari, mulohazalari va qayta ko'rib chiqishlari to'plamini boshqaradi va himoya qiladi, vaqt o'tishi bilan o'sishni namoyish etadi. Nafaqat yakuniy mahsulotni, balki jarayon sifatini ham baholaydigan aniq rubrikalarga ega loyihaga asoslangan baholashlar - tahlilning ravshanligi, jamoaviy hamkorlikning samaradorligi, ko'rsatilgan axloqiy mulohaza - integratsiyalashgan kompetensiyani bevosita o'lchaydi. Talabalar o'zlarining texnik tanlovlarini auditoriyaga tushuntirib beradigan va himoya qiladigan yakuniy namoyish yoki "viva" yopiq kitobli testga qaraganda chuqur tushunish va muloqot qobiliyatini ancha samaraliroq baholashi mumkin.

Ushbu pedagogik model o'qituvchining rolini tubdan qayta belgilaydi. O'qituvchi kontentni yetkazib beruvchi fan mutaxassisidan o'quv tajribasi me'mori va kompetensiyalar bo'yicha murabbiyga o'tadi. Asosiy vazifa talabalarni har bir asosiy kompetensiyaning rivojlanish yo'lida yo'naltiradigan loyihalar, tadbirlar va fikr-mulohaza mexanizmlari ketma-ketligini loyihalashdir. Bu chuqur pedagogik kontent bilimlarini - nafaqat ITni, balki talabalarning odatiy noto'g'ri tushunchalarini va ular kompetensiyaga erishishda bosib o'tadigan rivojlanish bosqichlarini tushunishni talab qiladi.

Sinf xonasida o'qituvchi shunchaki ma'ruzalardan ko'proq narsani o'rgatadi. Ular muammolarni hal qilish mashg'ulotlarini osonlashtiradi, talabalarning fikrlash tarzini ochib berish uchun tadqiqot savollarini beradi, nosozliklarni tuzatish yoki axloqiy tahlil kabi ekspert amaliyotlarini namuna qilib ko'rsatadi va talabaning loyiha ishi umumiy bilim bo'shlig'ini aniqlaganda, o'z vaqtida mini-ma'ruzalar o'tkazadi. Ehtimol, eng muhimi, kompetentsiyaga asoslangan sinfda o'qituvchi o'zi singdirmoqchi bo'lgan moslashuvchanlik va uzluksiz o'rganishni namuna qilib ko'rsatishi kerak. Talabalar bilan birga yangi texnologiyalar bilan shug'ullanish, o'z bilimlarining chegaralarini ochiq muhokama qilish va yangi ma'lumotlarni qanday topish va baholashni namoyish etish moslashuvchan o'rganishning asosiy kompetentsiyasini mustahkamlaydigan kuchli pedagogik harakatlardir.

Xulosa

Bakalavriat sinfida asosiy IT kompetensiyalarini shakllantirish qasddan va tizimli ravishda amalga oshiriladigan ishdir. Bu texnik mavzular ro'yxati bilan belgilangan o'quv dasturidan kompetensiyani rivojlantirishning izchil yo'li sifatida ishlab chiqilgan yo'lga o'tishni talab qiladi. Ushbu yo'l texnik va insonga yo'naltirilgan ko'nikmalarni birlashtirgan haqiqiy, loyihaga asoslangan tajribalarga asoslangan bo'lib, murakkabligi ortib boradi va tajriba o'sib borishi bilan yo'qoladigan iskala bilan qo'llab-quvvatlanadi. U refleksiv amaliyot bilan quvvatlanadi va uzluksiz, shakllantiruvchi fikr-mulohazalarni taqdim etuvchi baholash bilan boshqariladi.

Natijada, o'tgan kurslarning nozik transkriptiga emas, balki mustahkam va integrativ qobiliyatlar to'plamiga ega bo'lgan bitiruvchi paydo bo'ladi. Ular nafaqat nima borligi haqida bilimga, balki nima bo'lishidan qat'iy nazar, nima bo'lishidan qat'iy nazar, nima bo'lishidan qat'iy nazar, o'zaro hamkorlik qilish uchun malakaga ega. Ular murakkab tizimlarni tahlil qilishlari, algoritmik yechimlarni loyihalashlari, samarali muloqot qilishlari, samarali hamkorlik qilishlari va ishlarining ta'siri haqida axloqiy fikr yuritishlari mumkin. Sinf xonasini ushbu doimiy malakalarni shakllantirish ustaxonasi sifatida qayta ko'rib chiqish orqali bakalavr IT ta'limi o'zining muhim vazifasini bajarishi mumkin: shaxslarni nafaqat texnologiya sohasidagi birinchi ishlariga, balki ular o'zlashtirmoqchi bo'lgan vositalar tomonidan doimiy ravishda qayta shakllantiriladigan dunyoda umrbod yetakchilik, innovatsiya va mas'uliyatli fuqarolikka tayyorlash. Raqamli kelajagimizning barqarorligi biz bugun shakllantiradigan malakalarning kuchiga bog'liq.

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