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PERSPECTIVES OF HIGHER EDUCATION DEVELOPMENT

ПЕРСПЕКТИВЫ РАЗВИТИЯ ВЫСШЕГО ОБРАЗОВАНИЯ

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РЕДАКЦИОННАЯ КОЛЛЕГИЯ

КИРИШ

Бугунги кунда мамлакат тараққиётининг ҳал этувчи кучи салоҳиятли кадрлар эканлигидан келиб чиқиб олий таълим тизимини ҳар томонлама модернизация қилишга катта эътибор қаратилмоқда. Олий таълим муассасаларининг фаолиятини замонавий талаблар асосида йўлга қўйиш, ислоҳ қилишда илғор хорижий тажрибаларни олиб кириш, ёш педагог ва олимларнинг янгича дунёқарашини шакллантириш энг муҳим масала эканлиги ҳам аён. Ушбу масалаларни ҳал этиш, ташаббус ва ғояларни амалиётга татбиқ этишда қонуний асос ва фармойиш ҳужжатларининг мавжудлиги бу тизимда ишлаётган мутасаддилар ва профессор-ўқитувчилар жамоасининг ишига ижодий ёндашувини шакллантиришда муҳим ўринга эга. Жумладан, Ўзбекистон Республикаси Президентининг 2019 йил 8 октябрдаги ПФ-5847-сон Фармони билан тасдиқланган Ўзбекистон Республикаси олий таълим тизимини 2030 йилгача ривожлантириш концепцияси, 2021 йил 24 декабрдаги "Давлат олий таълим муассасаларининг академик ва ташкилий-бошқарув мустақиллигини таъминлаш бўйича қўшимча чора-тадбирлар тўғрисида"ги ПҚ-60-сонли ҳамда "Давлат олий таълим муассасаларига молиявий мустақиллик бериш чора-тадбирлари тўғрисида"ги ПҚ-61-сонли қарорлари тизимдаги янги қарашлар асосидаги фаолият учун ҳуқуқий асос вазифасини ўтамоқда.

Олий таълимда ўқув жараёнларининг кредит-модуль тизимига босқичма-босқич ўтилаётганлиги, илмий тадқиқотлар натижаларининг нашрлар ва иқтибослик асосида халқаро даражада тан олиниши томон ҳаракатлар, битирувчиларнинг иш билан таъминланиши ва юқори сифатда баҳоланиши кабилар барчаси олий таълимнинг халқаролашуви билан алоқадор бўлмоқда.

Бу босқичда амалга оширилаётган ишларнинг барчасини тизимли ташкил этаётган олий таълим муассасалари орасида халқаро тан олинган THE ва QS каби рейтинг тизимларига кириш сари қадам қўйганларининг борлиги қувонарли ҳол. Хусусан, бу йилги натижаларга кўра Ўзбекистон олий таълим муассасаларидан 30 таси THE халқаро импакт рейтингида репортер мақомига эга бўлганлиги ёки 8 та олий таълим муассасасининг QS халқаро рейтингида Осиё минтақаси бўйича кўрсаткичлар тизимида 100 дан 700 гача бўлган ўринга муносиб деб баҳолангани ҳам айнан ўша олий таълим даргоҳларида фаолиятнинг концепциясига мувофиқ тизимли ташкил этилгани билан бевосита боғлиқ.

Шуни алоҳида таъкидлаш жоизки, таълим жараёнини сифат жиҳатидан янги босқичга кўтариш ҳамда ўқитишнинг илғор шакллари, ахборот-коммуникация технологияларини жорий этиш орқали янги босқичга олиб чиқиш ҳам энг муҳим масалалардан бири. Бу эса олий таълимда бутун тизимини – бошқарув, ўқув ва илмий фаолиятларни рақамлаштириш билан боғлиқ бўлиб турибди. Мазкур вазифалар ижроси, ўз навбатида, олий таълимда трансформация жараёнларини амалга оширишда энг катта омил.

Ушбу мураккаб, кўп тармоқли янгиланиш жараёнларида Европа таълим муҳити элементларининг жорий этилиши, ҳамкор университетларнинг яхши тажрибаларини олиб киришда Эразмус+ дастурларининг аҳамиятини таъкидлаш жоиз. Хусусан, миллий офис ва экспертлар ташаббуси билан чоп этилаётган "Олий таълим тараққиёти истиқболлари" илмий-методик журналнинг мунтазам чоп этилаётганлиги, унда ёритилаётган мақолаларнинг қамрови ва масалалари кенгайиб бораётганлиги олий таълим муассасалари фаолиятида тизимли ёндашув талаб этилишини кўрсатиб турибди.

Журналнинг мазкур сонида ўқув жараёнлари, илмий тадқиқот йўналишидаги ишлар самаралари, олий таълимда рақамлаштириш, ахборот ресурслари билан ишлаш, кутубхона фаолиятини такомиллаштириш, таълим ва фан интеграцияси, фанларнинг йўналишларига оид тадқиқотлар ва олий таълимда сифат масалалари, халқаролашувнинг кўп қиррали жиҳатларига оид масалалар қамраб олинган мақолаларнинг танлангани билан аҳамиятга молик. Айниқса, Эразмус+ лойиҳалари бўйича Ўзбекистондаги бугунги янгиликлар, танлов натижалари ва келгуси имкониятларимиз акс этган мақолаларнинг ҳам киритилганлиги қилинадиган ишларимиз қамрови ниҳоятда кенглигидан далолат беради.

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INTRODUCTION

Since current trends show that the prominent factor in the development of the country is nurturing promising personnel, comprehensive modernization of the higher education system is highlighted. Undeniably, matters such as running the activities of higher education institutions in compliance with modern requirements and introducing reforms based on the foremost international experiences are of high importance in the formation of young pedagogues and scientists with a new outlook.

The availability of relevant legal basis and regulations for implementing initiatives and ideas has an important role in enabling officials and faculty members to form a creative approach in the system. The Presidential decree of the Republic of Uzbekistan "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030" dated October 8, 2019 PF-5847, the Presidential Decree of the Republic of Uzbekistan dated January 28, 2022 "On the Development Strategy of New Uzbekistan for 2022-2026" PF-60, "On measures to provide financial autonomy to state higher education institutions" PF-61 serve as a legal basis for activities based on modern approaches in the system.

The gradual transfer to the credit-modular system in higher education, efforts towards international recognition of the results of scientific research based on publications and citations, employment and recognition of highly qualified graduates are all related to the internationalization of higher education.

It is rejoicing that among the higher education institutions that are systematically organizing all the work being carried out at this stage, there are those that have taken steps towards entering the list of internationally recognized ranking systems such as THE and QS. In particular, according to the results of this year, 30 of Uzbekistan's higher education institutions have the status of *reporter* in the international impact ranking of THE, and 8 higher education institutions are ranked as worthy of the place from 100 to 700 in the index system for the Asian region in the QS international ranking– this is directly related to the systematic organization of the activities in higher education institutions according to the Concept.

It is worth noting that eenhancing quality of education and bringing it to a new level through the introduction of advanced forms of teaching and information and communication technologies is of high importance. This is closely related to digitization of the entire system of higher education - management, educational and scientific activities. The implementation of these tasks, in turn, is the crucial factor in the implementation of transformation processes in higher education.

It is worth stating the importance of the Erasmus+ programme in introducing elements of the European educational environment and bringing good practices of partner universities into these complex, multidisciplinary renewal processes. In particular, the regular publication of the scientific-methodical journal "Perspectives of Higher Education Development" published by the initiative of the National office and experts, the scope of the the issues covered by articles demonstrates that a systematic approach is required in the activities of higher education institutions.

This issue of the journal is essential since it covers articles on educational processes, scientific research results, digitalization in higher education, working with information resources, improving library activities, integration of education and science, research on the directions of science and quality issues in higher education, and multifaceted aspects of internationalization.

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ОГЛАВЛЕНИЕ

I. СОВРЕМЕННЫЕ ТЕНДЕНЦИИ РАЗВИТИЯ ВЫСШЕГО ОБРАЗОВАНИЯ

CASE STUDY: DEVELOPING EMOTIONAL INTELLIGENCE THROUGH NON-TRADITIONAL METHODS OF TEACHING POETRY TO UNDERGRADUATE STUDENTS IN UZBEKISTAN

Maria Delane

Abstract: Emotional Intelligence (EI) is an ongoing development that is essential to both personal and professional success. The evidence for this is overwhelming across spheres and disciplines. Since EI is not considered a priority next to the acquisition of theoretical or technical knowledge, higher education curricula are not sufficiently oriented to develop EI. The objective aim of the present case study is to bridge this gap in education by introducing innovative methods for teaching poetry that emphasize aesthetic experience over functionality. The example here is taken from the British Management University in Tashkent where an experimentation of such methods have been put into practice namely through the extra-curricular activity of an ongoing poetry club. The findings suggest that these methods generate student interest and involvement in the subject of poetry. Secondly, students develop a greater awareness of their emotions as well as those of others. Consequently showing that, poetry can be a valuable resource for developing students' EI.

Keywords: Emotional Intelligence, Poetry, Aesthetic Experience, Classroom Climate, Socratic Method.

РАЗВИТИЕ ЭМОЦИОНАЛЬНОГО ИНТЕЛЛЕКТА С ПОМОЩЬЮ НЕТРАДИЦИОННЫХ МЕТОДОВ ОБУЧЕНИЯ ПОЭЗИИ ДЛЯ СТУДЕНТОВ БАКАЛАВРИАТА В УЗБЕКИСТАНЕ

Maria Delane

Аннотация: Эмоциональный интеллект (ЭИ) — это постоянное развитие, необходимое как для личного, так и для профессионального успеха. Можно найти множество подтверждений этого в разных сферах и дисциплинах. Наряду с этим, ЭИ не считается приоритетом по сравнению с приобретением теоретических или технических знаний. Учебные программы высших учебных заведений недостаточно ориентированы на развитие ЭИ.

Цель настоящего исследования состоит в том, чтобы восполнить этот пробел в образовании путем внедрения инновационных методов обучения поэзии, которые подчеркивают эстетический опыт, а не функциональность. Приведен пример из Британского Университета Менеджмента в Ташкенте, где такие методы были опробованы на практике, а именно посредством внеклассной деятельности поэтического клуба. Полученные данные свидетельствуют о том, что эти методы вызывают у студентов интерес и вовлеченность в предмет поэзии. Во-вторых, учащиеся лучше осознают свои эмоции, а также эмоции других. Показано, что поэзия может быть ценным ресурсом для развития ЭИ студентов.

Ключевые слова: Эмоциональный Интеллект, Поэзия, Эстетический Опыт, Климат В Классе, Метод Сократа.

Introduction

Emotional intelligence (EI) refers to the capacity to accurately perceive and express the emotions in oneself and others, to regulate emotions, and to utilize emotions for problem-solving[1]. In addition, Goldman (1998) proposes five general components of EI that includes –self-awareness, self-regulation, motivation, empathy, and social skills[2]. Numerous studies have found that EI is a positive predictor of work performance[3]. As well as, the bedrock for leadership and long-term professional success[4]. Furthermore, in a study conducted on 560 first-year university students, results indicated that emotional intelligence positively predicted student engagement, promoted learning outcomes, and improved academic performance as evidenced by student GPA scores[5]. Despite considerable evidence, emotional intelligence is an overlooked component in higher education curricula where theoretical and technical knowledge take priority. While the primary purpose of higher education is indeed to prepare students to enter the job market, however, a focus on technical and theoretical knowledge has its limitations and does not sufficiently prepare students for long term success in the work place environment[6].

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[1] Salovey, P., Mayer, J.D..(1990). *Emotional Intelligence. Imagination, Cognition, and Personality.*

[2] Goldman, D. (1998). *Working with Emotional Intelligence.* New York, Bantam.

[3] Dulewicz, V., Higgs, M. (2000). *Emotional Intelligence.* Journal of Management Psychology.; see also
Kushwaha, S.G. (2012). Emotional Intelligence and Work Performance of Executives. Organizational Psychology Journal.

[4] George, J.M. (2000). *Emotions and Leadership: The Role of Emotional Intelligence.*; see also
Cotrus, A., Stanciu, C., Bulborea, A. (2012). *EQ vs. IQ: Which is most important in the success or failure of a student?* Elsevier Ltd.

[5] Zhoc, K., King, R., Chung, T., Chen, J., (2019). *Emotionally intelligent students are more engaged and successful: examining the role of emotional intelligence in higher education.* European Journal of Psychology of Education.

[6] Di Fabio, A., and Bucci, O. (2016). *Green positive guidance and green positive life counseling for decent work and decent lives: some empirical results.*; see also

This case study describes an avenue for developing emotional intelligence through non-traditional methods of teaching poetry namely to undergraduate business students in Uzbekistan. Indeed, the Academy of American Poets have encouraged educators to develop new and creative ways for teaching poetry. However, many colleges opt to teach poetry as an academic informational course. In effect, there is a general decline in the interest of learning poetry. This decline as Creely (2019) suggests may be due to pedological notions of literature that focus on function rather than creative expression[7].

The author of this case study is a general education instructor at British Management University in Tashkent. As the author has seen from experience, running a poetry club for over three semesters now, students have progressively become more interested in the subject of poetry. The author's background in poetry is not pedological, but rather aesthetic. On one hand, this meant the author had no particular method in mind when the idea of a poetry club was first conceived. On the other hand, the author was open to experiment with various approaches. Previously, the author had been exposed to poetry in the United States where it is widely taught by means of analyzing poems for hidden meanings. Upon arriving to Uzbekistan, the author had discovered that poetry is traditionally taught by way of memorization and specific instructions about the author's meaning. While each method can serve a specific purpose in each context neither supports the creative and self-expressive value of poetry. Since poetry reveals the assortment of basic human emotions and experiences. As readers relate to poetry, they gain a higher degree of awareness of self and other. In turn, developing the initial components of emotional intelligence. The selection of poems the author chooses for the club are either written or translated into English. In the last year, the poetry club read poems from ten different countries, each discussing universal themes and topics. For many of the students, English is a second or third language. Therefore, the author carefully selects poems with vernacular that is accessible to their level. Some criticism can be made on the point of taking English words as if they stand for universal concepts such as, 'happiness', 'sadness', 'anger', etc. which may be culturally or linguistically specific[8]. However, even in the absence of language, emotions are undeniably present and integral to all human experience. The author relates her own personal experience to the discussion having grown up in a household where three languages were spoken. As a child, the author was drawn to

Rivers, S. and Willans, T. (2013). *Student Engagement in Private Sector Higher Education*.

[7]Creely, E. (2019). *'Poetry is dying': Creating a (re)new(ed) Pedagogical Vision for Teaching Poetry*. Australian Journal of Language and Literacy.

[8] Wierzbick, A. (2008). *Talking about Emotions: Semantics, Culture, and Cognition*. Australia National University,

poetry specifically because it supplied her with a resource of words and language to touch on certain unknown feelings. Poetry evokes abstract imagery beyond conceptual language. Since poetry has had a transformative impact on the author's life, it is something that she has aimed to inspire in students. Moreover, from the author's observation of the current context, Uzbeks are among the most creative and interesting people –if given the space and freedom to express that creativity. But, as one of the author's students put it, "we are taught to control our emotions, not express them." Similarly, creativity can be viewed negatively as something to be suppressed or controlled especially if it deviates from the acceptable norm. As a developing country, Uzbekistan is in the midst of major reforms and transitions. Though, a look back into Uzbekistan's history reveals one of constant change and transition. The impact this has had on generations is an inherited trait of tolerance for uncertainty and an adaptability to change. Conversely, a positive implication of 'tolerance for uncertainty' is its link to creativity[9]. In the author's two years of teaching experience in Uzbekistan, it seems she has learnt far more from students than she has had the privilege to teach. In this respect, the author views her teaching role as a facilitator of the classroom learning experience rather than an authority of knowledge.

Materials and Methods

The author draws on several key concepts to discuss the rationale for the proposed methodological approach. In the book, *Literature as Exploration*, Rosenblatt (1938) coins the concept 'Transactional Theory' to refer to a process of reading where the reader is an active participant in constructing meaning rather than a passive receiver of meaning: "a novel or poem remains merely inkspots on paper until a reader transforms them into a set of meaningful symbols."[10] Moreover, Rosenblatt (1978) differentiates what she calls 'efferent' from 'aesthetic' reading. While efferent reading focuses on information that a reader will take away from a text, aesthetic reading advocates a process that engages the reader in an experience.[11] Furthermore, Creely (2019) explores this concept of an experiential approach to poetry in depth with a phenomenological analysis of how poetic imagery constructs within consciousness. Since sensory experience is residual in memories of the individual then potentiality for constructing the

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[9] Pavlova, M., Kornilova, T. (2013). *Creativity and Tolerance for Uncertainty Predict the Engagement of Emotional Intelligence in Personal Decision Making.* Lomonosov Moscow State University.

[10] Rosenblatt, L.M. (1938). *Literature as Exploration*. D. Appleton-Century, incorporated.

[11] Rosenblatt, L.M. (1978). *the Reader, the Text, and the Poem*. Southern Illinois University.

sensuous imagery of poetic language in the mind of the reader is a resurgence of past memories.[12]

From this understanding, every reader generates a unique experience (or interpretation) unlike any other due to variations of past experience. These implications of reading as a process support what the author has observed in classroom discussions that follow each reading and the personal satisfaction derived from listening to students recreate poems from their own understanding. However, for students to reach this stage of mental and emotional processing, it is important at the beginning to explain to them some of these theories. The assumption is that once students are liberated from any preconceived notions that they should be 'looking for something' in the text, there is shift from passive to active learning. In this model, students learn how to be present while experiencing poetry reading and sharing perspectives with the rest of the class. It shifts their 'judgmental critical mind set' into a realm of the 'expressive creative mind set'.

As an instructor, there are limitations in the capacity to motivate college students to learn especially when they arrive to class with whatever baggage or moods may be weighing on their minds from the passing day. In classrooms, we emphasize teaching students content as if they are empty vessels to be filled with information. However, we rarely acknowledge the stresses of the human experience that students have to deal with which can impact their motivation to learn. It is for this reason the author aims is to create a classroom climate that eases students the moment they walk through the door. The purpose is to provide students with a space that allows them to be who they are and leave everything behind as they enter into an oasis where they can discover poetry and explore aspects of their innermost selves reflected in the lines of the poem.

Before students even enter the classroom space into poetry club, they can hear the soft sound of binaural tones that the author plays in the background. At one occasion a student had stated that she was not sure which room poetry club was in, but following the soft sound of the music led her to the poetry club classroom. Binaural tones are sound waves that are intended to have a calming effect on the listener. They are used in a wide range of meditative music that can be found on YouTube. The author projects one of these videos on a screen accompanied by various colorful displays of geometric forms. The soothing sound and colorful ambiance are intended to positively affect the mood of all who enter the poetry club space.

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[12] Cushing, I. (2018). *'Suddenly, I am part of the poem': texts as worlds, reader-response and grammar in poetry*. National Association for the Teaching of English.

The way the author sets up poetry club is different from the traditional classroom. She redesigns the physical environment to reflect a community that is formed to share and enjoy poetry. In traditional classrooms settings the chairs are placed in ordinal order. Undergraduate business students are used to this kind of seating which conveys power, structure, and formality. In the poetry club classroom, the author will rearrange this usual seating. All desks are moved to the back of the room and chairs are positioned to form a large circle. The idea is to set up the class in such a way that would place everyone (including the instructor) in an equal position without any physical barriers. By this rearrangement, the idea is for students to feel they have as much right to their interpretations and meanings as anyone else in the room. Before every session, a printed copy of the day's poem is placed on each chair. Students are given two minutes to look over the poem. The author thinks it is important for students to first encounter the poem for themselves in the privacy of their mind. At the beginning of the session, students are encouraged to think about "meaning" as something that we construct cognitively on our own. And that as the club meeting progresses, student's confidence in their ability to construct meaning from the poem will evolve. The expectations are set clearly and transparently to build trust relationships with the students. The author's personal objective is for students' to not only learn to appreciate poetry, but also build confidence in their ability to interpret and reconstruct meaning. Often, students are worried about either getting it "wrong" or "right". However, students are encouraged to rethink such concepts. Students need to trust in the process of exploration rather than on achieving an outcome to allow their thoughts to flow freely.

During each session, students take turns in reading the poem aloud. We begin with the instructor and then the person seated next, and so on, until we have come full circle and everyone has had the chance to read and hear the poem read through many different voices. This repetition gives students the time to think deeply about the different parts of the poem that stand out after hearing it many times. It also creates a sense of familiarity with the poem. Sometimes students will even ask to read a poem aloud once more. The author has observed that as students are familiar with the poem and raise their voice with the motions of the language, emotions can be heard in their tone.

The discussion that follows every poem begins with the same question: *which words or lines in the poem stood out to you?* This is when students are most eager to share something that captured their emotions or imagination. Then, the discussion trails into ideas about the various images within the poem and what they may symbolize. The author finds these reflective discussions fascinating because the student's reflections and interpretations allow the author to look at an old poem in a way the she had not considered before. The author conveys her appreciation to

students for sharing the unique perspectives they bring that expresses their background, identity and who they are. After free-style reading and sharing of perspectives, the discussions are kept rolling through guided questioning in a stylistic manner that resembles the 'Socratic Teaching Method'. This is a technique that has been inferred from *Plato's Dialogues*[13] where the central figure, Socrates, engages in a question and answer discussion for the purpose of reaching greater understanding rather than any particular conclusion. In fact, in most of *Plato's Dialogues*, a conclusion is rarely reached. The dialogues begin with an open end, and close in just the same way. This method is useful when discussing abstract concepts such as emotions and why teaching poetry in this way can help students to understand themselves better.

The following is an example of a classroom dialogue (after reading the poem *Fear* by Khalil Gibran[14]) illustrating the proposed method:

Teacher: Why is the river afraid?
Student: it's afraid of changing and becoming the ocean
Teacher: What do you think the river represents?
Student: How people are afraid of changes.
Teacher: Can you give us an example?
Student: maybe afraid to become an adult with responsibilities.
Teacher: Ok. What would be the opposite of fear?
Student: confidence
Teacher: Ok. Why do you think some people are afraid while others are confident about changes?
Student: maybe people who are afraid are focusing on the negatives but the people who are confident are looking at the positives
Teacher: So are you saying that a person can decide if they are afraid or confident?
Student: well, I think they can decide what to focus on and then the feeling will either go this way or that way.

Results

As these discussions begin through guided questioning, we do not have a destination in mind. The instructor simply listens and asks questions from her own source of curiosity. The way these typically unfold is a process of exploration and

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[13] Plato, et al. (1987). *The Collected Dialogues of Plato, Including the Letters*. Princeton University Press.

[14] Gibran, Khalil, and Mikhā'īl Nuʿaymah. (1990). *The Full Range of Literary Works by Khalil Gibran / Al-Maǧmūʿah Al-Kāmilah Li-Mū'alafāt Ǧibrān Ḫalīl Ǧibrān*. S.n.

discovery on all ends. This is what makes these discussions interesting to engage in. Instead of satisfying ourselves with one single answer, we go deep into the implications of that given answer to find out what we really mean. In so doing, we explore an abstract space between thoughts and feelings and here we build higher self-awareness. This is especially beneficial with a community of poetry readers that can inquire on their perspectives and build awareness of others emotions. Thus, enhance emotional intelligence. The questions that the instructor asks her students grow organically from present moment thought. The instructors intention should simply be to listen carefully to students and allow for whatever meaningful dialogue to take place.

Discussion

In retrospect, emotions do not exist in isolation. They are part of a broader network of invisible systems that connect us to ourselves and others. It can be difficult to understand emotions because they are abstract and often times ambiguous. Unfortunately, when people struggle to find the language to articulate or understand their own emotions, they will cope with their feelings by either suppressing or detaching from them. The consequences of this can negatively impact one's personal and professional life. Therefore, understanding how emotions arise and operate within can help one to achieve optimal results in their profession and provide an overall clarity in personal affairs. For this reason, colleges should seek to develop EI in students insofar as theoretical and technical knowledge are acquired.

Poetry is one avenue for developing EI since it can provide its readers with a resource of language and imagery to help explore and express emotion. Furthermore, since poetry can cast a light on repressed thoughts and feelings it is especially important that readers are situated in a nurturing environment. At the same time, the process can be cathartic. Readers can feel a sense of relief from the shared understanding that arises out of reading and discussing a poem. Thus, illuminating a path toward emotional intelligence. Calming music, soothing colors, and rearrangement of chairs are ways that the author has transformed the classroom space into a welcoming environment, however, these are mere examples of many possibilities. Each instructor can utilize his or her classroom space to create a nurturing environment that is as unique as the instructor is. More importantly, it is the instructor's intention to set up an inviting atmosphere that will guide them toward their own process.

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ARTIFITIAL INTELLEGANCE IN HEALTHCARE: LESSONS FOR UZBEKISTAN

I. Vikhrov

Abstract: This publication is intended to study the use of artificial intelligence (AI) technologies in healthcare and medicine, as well as to understand the current state and trends in the development of AI in healthcare. In addition, the author outlines the potential improvements associated with the use of AI technologies in medicine, along with problem areas and possible risks. For the author of the article, it is extremely important to focus the research on the practical application of AI technologies in the field of healthcare, in connection with which an example of the practical development of an AI tool was given.

The work is important in training highly qualified specialists and increasing the level of knowledge of medical professionals in the field of AI application in medicine. The use of chatbots as a means of freeing medical staff from routine will allow them to focus on their Covid patients, as well as on creative activities to improve their skills. Besides, it provides a brief overview of how chatbots used in other countries work and how effective they are.

Keywords: artificial intelligence in healthcare, digitalization, Uzbekistan, covid-19, chatbot.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В ЗДРАВООХРАНЕНИИ: УРОКИ ДЛЯ УЗБЕКИСТАНА

Вихров И.П.

Аннотация: Данная публикация предназначена для изучения использования технологий искусственного интеллекта (ИИ) в здравоохранении и медицине, а также для понимания текущего состояния и тенденций развития ИИ в здравоохранении. Кроме того, автор описывает потенциальные улучшения, связанные с использованием технологий искусственного интеллекта в медицине, а также проблемные области и возможные риски. Для автора статьи крайне важно сосредоточить исследования на практическом применении технологий искусственного интеллекта в сфере здравоохранения, в связи с чем был приведен пример практической разработки инструмента искусственного интеллекта.

Эта работа также важна для подготовки высококвалифицированных специалистов и повышения уровня знаний медицинских работников в области применения искусственного интеллекта в медицине. Кроме того, в

нем содержится краткий обзор того, как работают чат-боты, используемые в других странах, и насколько они эффективны. Тема чат-ботов имеет решающее значение в области здравоохранения, а это означает, что врачи и медсестры, которые работают непосредственно с пациентами, освобождаются от своих рутинных обязанностей, чтобы сосредоточиться на своих пациентах с Covid, а также на творческой деятельности для улучшения своих навыков.

Ключевые слова: искусственный интеллект в медицине, цифровизация, Узбекистан, Covid-19, чат-бот.

Introduction

The development of AI technologies is currently very relevant and occupies one of the first places on the agenda of scientific research around the world. The flow and volume of information generated is so large that the human brain is unable to cope with the analysis of incoming data, and therefore information technologies for processing big data, as well as technologies using AI, including in healthcare, have become widespread.

The field of AI research is quite young and in general it is difficult to identify well-established terms, classifications, standards and norms, nevertheless, scientists working in the field of AI have a certain range of issues that affect various aspects of this area of knowledge. It is no coincidence that experts in the field of public health are closely monitoring trends in the development of AI and its use in medicine. Given the rather strict standards that are used in healthcare and medicine, because it concerns human health, scientists predict the imminent flourishing of AI technologies in healthcare and medicine. Which is expected to qualitatively increase the level of medicine, and, accordingly, will contribute to increasing life expectancy, reducing mortality and improving medical literacy of the population.

The possibilities of using AI in the field of healthcare and medicine are very diverse. More and more new mobile applications using AI technologies are appearing. Moreover, large international technology companies are entering the healthcare market that want to participate in the development of personalized healthcare using AI technologies and mobile healthcare services (M-Health). Of course, algorithms and the use of AI technologies can significantly improve the quality of medical services, thereby contributing to a more efficient use of financial and human resources by the state. This basic approach, focused on the capabilities of AI to improve the quality of medical services provided, should serve as a starting point for considering the topic of this article. However, the use of AI technologies also poses new challenges for us – along with the question of what kind of digital progress we as a society want.

Any study of issues related to healthcare quickly touches on fundamental ethical and moral aspects, the main one of which is what opportunities and risks does the use of AI technologies in healthcare and medicine create? The practical

examples given in this review illustrate the breadth of potential applications of AI technologies in healthcare – from predicting mental illness among social media users to providing expert support for therapeutic decisions of doctors and even helping paralyzed people to restore their mobility. Examples of the use of AI technologies in the diagnosis of Covid-19 were studied in more depth.

This study reveals the topic of how significantly AI technologies can contribute to improving the quality of medical services provided, but at the same time the authors highlighted the issues arising in connection with their use, concerning issues of equal and fair access to medical services, the responsibility of doctors and patients for decisions based on AI, and changes that occur in the relationship between doctors and patients in the era of total digitalization. Accordingly, not least this casts light on the problem of trust in the health care system itself.

Therefore, in the author's opinion, we, as citizens of the Republic of Uzbekistan, need to come to an understanding that AI technologies that are used in healthcare and medicine should be collectively discussed and approved, and we also need to understand where the "yellow stop line" should be drawn, beyond which it is not necessary to go.

The Republic of Uzbekistan also actively carries out research in the field of AI, including through the development and adoption of legislative acts, development strategies and support for scientific projects and academic educational initiatives. Thus, by Decree of the President of the Republic of Uzbekistan No. UP-6079 dated 05.10.2020 "ON APPROVAL OF THE DIGITAL UZBEKISTAN-2030 STRATEGY AND MEASURES FOR ITS effective IMPLEMENTATION", the Digital Uzbekistan –2030 strategy was adopted, where, among other things, the adoption of targeted programs of research and innovation projects in the areas of development of the country's digital economy is expected. Moreover, the priority of such targeted programs is expected to be such research topics as the study and application in practice of the possibilities of using virtual and augmented reality technologies, artificial intelligence, cryptography, machine learning, big data analysis and cloud computing in economic sectors.

Moreover, the Ministry of Innovative Development of the Republic of Uzbekistan has developed a draft Decree of the President of the Republic of Uzbekistan "On the STRATEGY for the development of ARTIFICIAL INTELLIGENCE IN the REPUBLIC OF UZBEKISTAN IN 2021-2022", which was proposed for discussion to the general public on 11/07/2020 on the State Portal for discussing draft regulatory legal acts. This draft regulatory document proposes a broad discussion and implementation of various aspects of AI in order to develop the Republic of Uzbekistan and achieve a competitive advantage of the country.

Republic of Uzbekistan has a long way to go for the development of AI, including in the healthcare system, but given the fact that the intellectual potential and motivation of medical scientists are very high, and also, due to the availability of infrastructural support from the state, we are deeply confident that the necessary breakthrough in the development of AI technologies in healthcare and medicine, it will be implemented in the very near future.

As of February 2022, the World Health Organization estimates that nearly 399 million cases of COVID-19 have resulted in more than 5, 7 million deaths worldwide [1]. During the Covid-19 pandemic around the world, new research was created in all areas, including in the healthcare system. It is hard to imagine a world of news without modern technology. Additionally, during the Covid-19 pandemic in Uzbekistan, a number of studies were conducted in the field of methodological manuals, online surveys, call centers, mobile applications. In the beginning of 2022, it is obvious that despite the research, this epidemiological process is still going on, which has a significant negative impact on its economic, social and health sectors. Despite the advice and information provided by the media during the pandemic, the number of polls among the population has increased. In fact, the population intensively searching for information on social media to get clear answers about Covid-19. It will enable the development of measures to meet the information needs of the population and the introduction of digital technologies in the healthcare system [2]. The Covid-19 Checker chatbot was created in July 2021 to manage the epidemiological situation, in accordance with the recommendations and guidelines of the World Health Organization.

Materials and research methods

During the global pandemic the use of chatbots increased significantly. Data on the use of chatbots in the healthcare system have been researched. These terms have been reviewed and analyzed in professional journal articles, including PubMed, Springer Link, Journal of Medical Internet Research, and Google Scholar. The study included only articles published in 2019-2021. From our research on the 10 most used chatbots, we analyzed that most chatbots were used in European countries and the USA.

To study the results of our own research, a chatbot developed by us was analyzed. The task of the chatbot is to facilitate decision-making and the choice of further actions in acute respiratory viral diseases COVID-19, colds and flu.

Results

Based on guidelines from the Italian healthcare system, Covid-19 worked on an anonymous survey called "Support for Surveys" during the pandemic. Query Support (QS) software is designed as a web-based algorithm. A total of 75,557 participants took part in the Italian "Survey Support" Chatbot. From them 65,207 were diagnosed with the flu and 19,062 had the Covid-19 virus. 65,207 had

symptoms but not PSR confirmed, as well as 8,692 participants who had contact with a patient with COVID-19 status [3].

Sorting out users with COVID-19 - Recommendations are made for screening those who have had contact with patients with confirmed symptoms or confirmed COVID-19 virus and taking appropriate action. Including anonymous access to the system is open to any user. Continuous communication is based on a chat interface [4].

Another algorithm was based on the 2009 Patient Selection for Nurses (HBS) program, which was developed around the world when the H1N1 virus was detected [5].

In this program, a coordinated state-wide HBS system called MN Flu Line (Minnesota Flu Line) was created to address the following objectives: (1) to provide accurate information, - to send consistent messages and assistance, including the use of antiviral drugs reducing public confusion through; (2) reducing the spread of the disease by reducing the number of patients who accumulate in health facilities; (3) reduction of medical indications in HCS to ensure that other priority medical needs are met; and (4) meeting the needs of uninsured or uninsured patients and patients who do not have easy access to health care [6].

Another study, using the concept of artificial intelligence created in a pandemic environment in Boston, USA, introduced the use of artificial intelligence to optimize claims and complaints in the "Nurse Helpline" only chatbot. The introduction of artificial intelligence to remotely perform tasks performed individually by clinical staff is an important step in the health care system. The Nurse Helpline online chatbot provides advice on patient management, the hospitalization of medium and severe patients, staying at home, and self-protection for those who come in contact a virus-confirmed patient. The chat used effectively by citizens and medical staff. The use of this chatbot for early diagnosis of the disease and to limit the chain of transmission of the disease received a 58% positive result [7].

At the beginning of the COVID-19 pandemic, the Copenhagen Emergency Medical Services (CEMS) developed a digital diagnostic "See a Doctor" chatbot to assess signs of infection. Launched in the Danish capital region. One week later, the device was introduced nationwide in Denmark and was used more than 90,000 times in the first week and almost 150,000 times in the second week. The chatbot was provided for 2 different purposes: (a) to assist isolated citizens in assessing whether their symptoms were potentially associated with COVID-19 and to advise them on when and where to seek additional medical care; and (b) reducing the number of calls to health hotlines [8].

Coronavirus symptom testing Chatbot "AVA" Chatbot developed under the guidance of WHO and the Indian Ministry of Health and Family Welfare. This

Chatbot developed an app based on population, age, gender, whether or not they were communication and a number of principal surveys [9].

Published in the Journal of Experimental Psychology on October 28, 2021, French scientists have developed a Chatbot that offers tailored answers to questions posed by curious or hesitant people and demonstrated its effectiveness. Vaccination hesitation is one of the key challenges in the fight against the COVID-19 pandemic. Previous research has shown that mass communication through short messages broadcast on television or radio is not an effective means of persuading hesitant. The team tested their Chatbot with 338 people. After a few minutes of chatting with Chatbot, the number of participants who expressed a positive opinion on the vaccine increased by 37%. After using Chatbot, people became more prone to vaccination, and the idea of vaccine rejection decreased by 20%. Additionally, this Chatbot is regularly updated with information about the new vaccine [10].

A total of 2,618,862 participants reported potential symptoms of COVID-19 in the American-made online mobile app Nurse Helpline. Among 18,401 people who tested SARS-CoV-2, the proportion of participants who reported a loss of smell and taste was positive (4,668 of 7,178 people; 65.03%) with a negative test, which was higher than that of the positive. 805 753- The participant estimated that COVID-19 may be present, of which 140,312 (17.42%) confirmed Covid-19 virus [11].

Another was the creation of the Covid-19 Preliminary Test website, developed by the Ministry of Health Uzbekistan. Unlike the Covid-19 checker bot, this online survey includes a few additional questions. For example: there are chronic diseases; whether or not they have been on a trip to a foreign country [12].

In Uzbekistan, in line with other countries, an online survey of the web application COVID-19 Checker has been developed. The survey was conducted from July to October 2021. The survey was conducted online via mobile phone, answering questions from participants about gender, age, whether or not they had been vaccinated, symptoms, and contact with other people.

A study conducted in Uzbekistan in this area, the Covid-19 checker bot developed by the Tashkent Pediatric Institute, involved 332 respondents, men and women aged 20-60 years and older [13].

The research conducted by the staff of the Innovation Center of the Tashkent Pediatric Medical Institute covers the period up to June-October 2021. As part of our research, COVID-19_CHECKER Chatbot was developed to help Chatbot users make a differential diagnosis between cold and flu. We analyzed COVID-19, the most common symptoms of cold and flu, and took into account some signs and indications. Table 1. shows the recommended distribution of signs and symptoms to provide information needed to distribute COVID-19, the likelihood of influenza and influenza infection, considering the seasonality and epidemiological situation.

Based on epidemiological situation, symptoms such as COVID-19 pentad's, fever, dry cough, loss of smell or taste, shortness of breath, and fatigue were given maximum scores. Vaccinations of users were also taken into account, which affected reducing the likelihood of COVID-19 infection.

Further, recommendations were developed, which were based on the percentage of the respondent's likelihood of COVID-19. A copyright certificate was obtained for the developed program at the Agency for Intellectual Property of the Republic of Uzbekistan (certificate No. DGU12138 dated 07/09/2021).

Table 1. COVID-19, Cold, and Flu ranking points

Features and signs	Covid-19	Common cold	Influenza
Temperature	150	20	80
Dry cough	150	20	75
Loss of smell or taste	150	0	15
Fatigue	150	10	10
Dyspnea	150	0	0
Joint pain	50	60	80
Diarrhea	50	0	80
Sore throat	50	70	10
Headache	30	10	80
Nausea and vomiting	30	0	0
Skin rashes	20	0	5
Rhinorrhea	10	80	5
Sneezing	0	80	0
Conjunctivitis	20	10	10
Pain in the eyes	0	20	70
Abdominal pain	30	60	10
Contact with an infected person	200	10	10

In total, 332 people took part in the online survey via COVID-19_CHECKER Chatbot between July and October 2021. Thus, the distribution of signs and symptoms is presented below.

According to the results of the Chatbot operation, the following data were obtained as indicated in the Fig.1 out of 332 participants, 174 were women and 158 were men. From them COVID-19 - 153 respondents, flu - 68, colds - 54 and 57 participants are not sick.
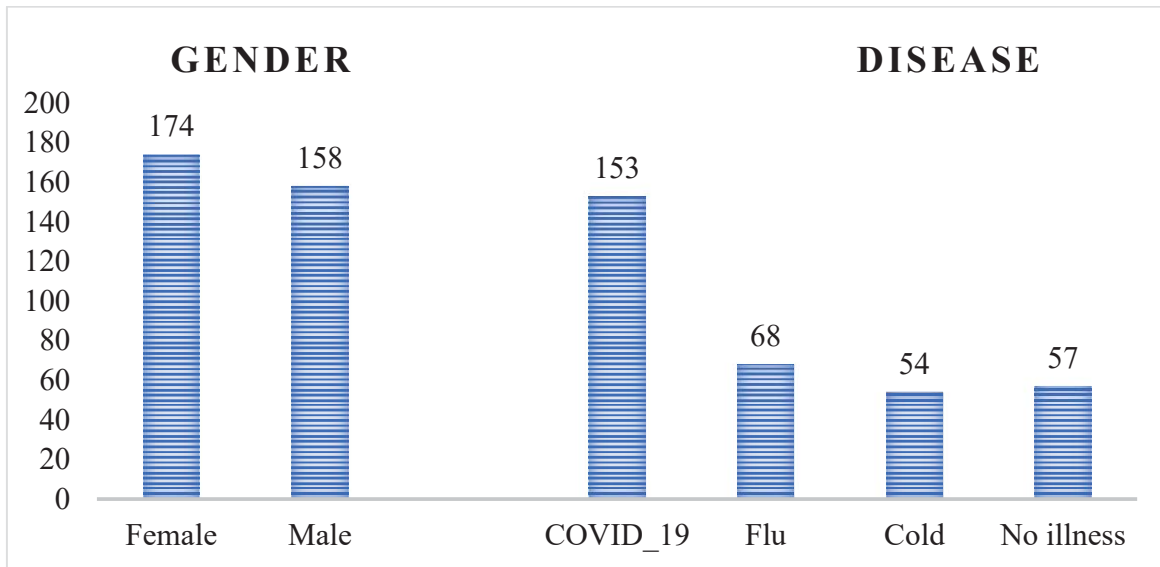
Figure 1. Distribution by sex and disease according to the Chatbot COVID-19-CHECKER
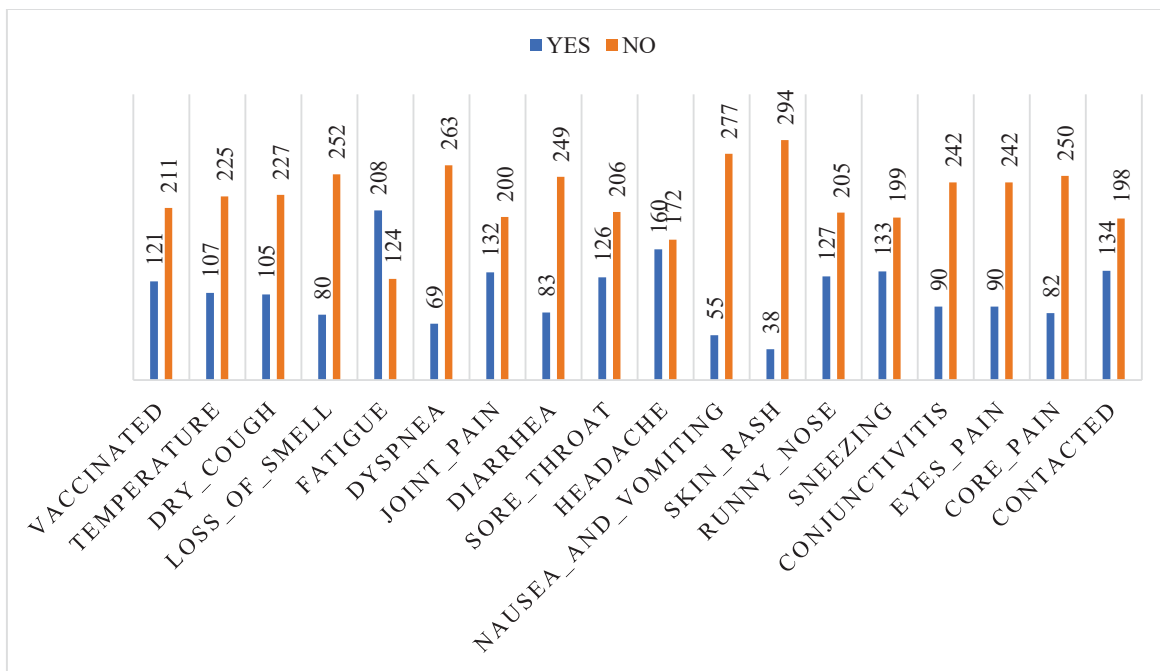
Figure 2. The distribution of symptoms and signs of COVID19_CHECKER Chatbot

In this diagram, the presence and absence of symptoms and signs are given. Among these indicators, the most common symptom in participants was weakness - 208, while in 124 participants it was not observed. Another 294 participants with

skin rashes denied this sign. Another of the most common symptoms was headache in 160 participants, and no symptoms of sore throat in 206 participants.

After that, work was carried out to develop a neural network architecture that could predict one of the 3 diseases with at least 95% accuracy. In this connection, the collected data were randomly divided into training (main) and test (control) samples. The training sample included 265 participants and the test group - 67 participants. With the help of the built-in software of the Keras library, each time the training and test samples were split anew, in connection with which a high level of random participation was ensured in the process of the neural network training experiment.

The neural network architecture itself consists of a number of successive layers shown in the figure below (Fig. 3). The sequential neural network includes a fully connected layer of 64 neurons with relu-activation, then comes the Dropout drop-down layer, which turns off 30% of the data from the operating process, then a fully connected layer of 32 neurons with relu-activation, as well as the Dropout drop-down layer, which turns off 20 from the processing % data. At the end, we add an output fully connected layer for 4 neurons with softmax activation. The last 4 neurons determine the probability of determining a disease: COVID-19, Colds, Flu, or no disease.
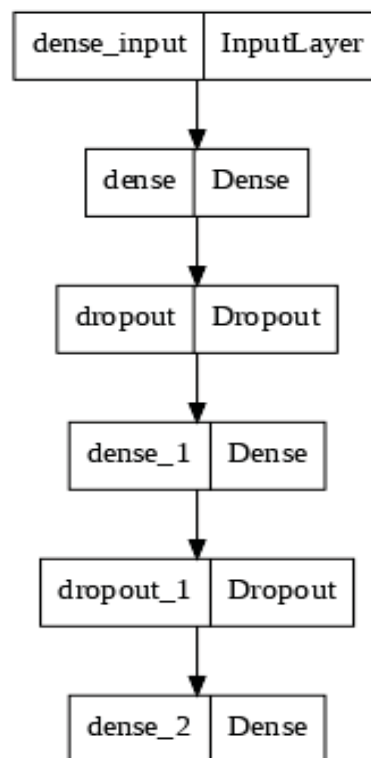
Figure 3. Neural network Architecture

In total, 3812 parameters are involved in training a sequential neural network. After training the network, we achieved an accuracy of more than 95% of the neural network. Below is a graph of the network training accuracy for 100 experimental epochs (Fig. 4).
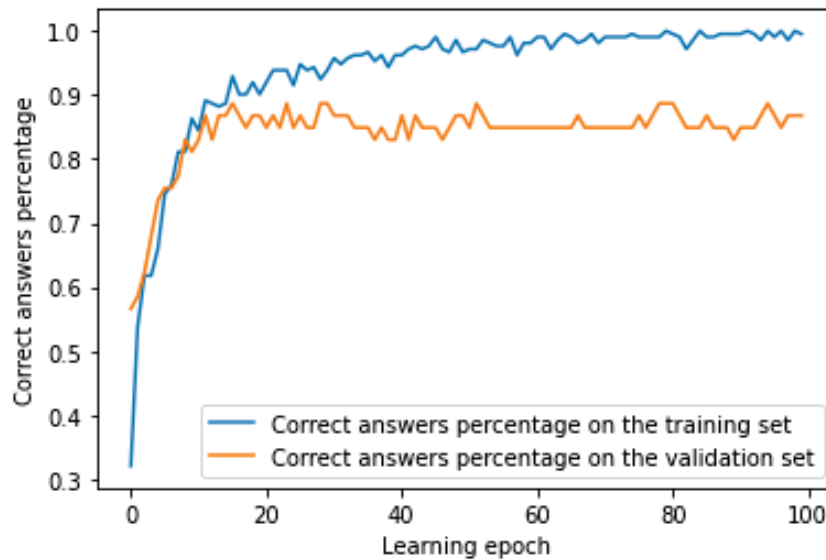
Figure 4. Accuracy Plot on the Training Set.

In this picture, we can see that the comparative percentage in correct answers on the training set with validation set. Although, percentages of correct answers in the validation set significantly less than the training set.

We also analyzed the graph of errors that occurred during experiments on 100 epochs to train the neural network (Fig. 5).
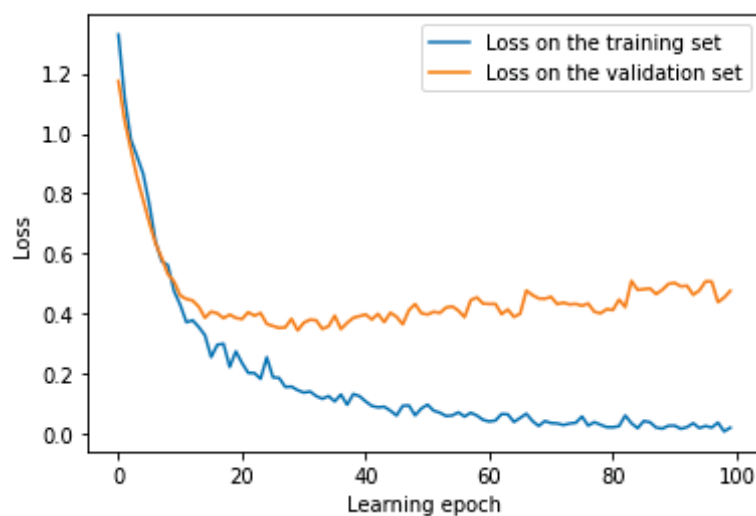
Figure 5. Loss on the training set

Comparative graph of the loss on the training set with validation set. This trade shows that the loss on the validation set noticeably higher than loss on the training set. Thus, the stated goal of achieving an accuracy of more than 95% in determining COVID-19 disease, influenza, colds or no disease in the test sample was achieved.

Comparative graph of the loss on the training set with the validation set. This trade shows that the loss on the validation set noticeably higher than loss on the training set. Thus, the stated goal of achieving an accuracy of more than 95% in determining COVID-19, influenza, cold, or no disease in the test sample was achieved.

Discussion

The development of AI technologies in healthcare and medicine is happening very rapidly. Countries such as China, the United States, the United Kingdom and a number of EU countries top the ranking of countries in the world for research and development in the field of AI, including in the field of AI for healthcare. In this regard, it seems important to us to get involved in the process of AI research in all fields, including medicine.

Experts attribute the future success of the development of the healthcare system in the world to the widespread introduction of digitalization in medicine, since e-health is an integral condition for the development of AI technologies in medicine. National electronic data in the field of healthcare is a necessary minimum for the widespread introduction of AI into medicine.

The benefits for healthcare systems that AI technologies bring are confirmed by the fact that absolutely all technological multinational corporations already produce commercial products for healthcare using AI. Moreover, the national governments of many countries have included issues of regulation and support for the development of AI technologies in all areas, including healthcare, in their current development agenda of the country.

In a number of countries, the matter of the near future is the widespread introduction of AI technologies into healthcare, which includes: the introduction of expert diagnostic and treatment systems based on AI technologies into the healthcare information system, the organization of a disease monitoring and surveillance system based on AI technologies, the prediction of diseases and mortality for a particular patient, taking into account individual characteristics, and so on.

These studies show that the use of chatbot services is widespread in developed countries. Given the slow development of artificial intelligence and information technology in Uzbekistan, we can propose that our research has made significant progress. Moreover, its widespread use in this area is an important factor in maintaining and diagnosing public health, especially in medicine in Uzbekistan.

Additionally, there are a number of shortcomings, especially in the health care system. One of them is to promote the rapid and easy use of digital technologies in the health care system, which ultimately involves the use of databases. These studies show that the use of chatbot services is widespread in developed countries.

The aim was to promote the rapid and easy use of digital technologies in the health care system, which ultimately involves the use of databases. It is also increasingly important to ensure that the public is properly aware of the clinical opportunities offered by these new technologies, and to ensure an optimal balance between social and individual benefits.

Conclusion

The Republic of Uzbekistan consistently solves all organizational issues of the development of AI technologies in all fields, including medicine, from the creation and adoption of the necessary regulatory documents and ending with the organization of the necessary innovation ecosystem to support startup initiatives in the field of AI.

Moreover, a number of universities in Uzbekistan have created bachelor's and master's degree programs in the field of AI technologies, which will give impetus to the development of human capital with the experience and necessary skills to develop intelligent AI systems.

Nevertheless, there remains a certain gap in the digitalization of the healthcare system and the transition to electronic healthcare in the Republic of Uzbekistan, which hinders the process of development and implementation of AI technologies in medicine. In this connection, the issue of training and retraining of personnel with experience and understanding of the work of electronic and digital healthcare, versed in intelligent and expert systems based on AI technologies, is acute.

The results show that at a time when the number of cases with Covid-19 is increasing, it is necessary to further increase the number of high-tech bots being developed in the healthcare system and ensure that they are perfectly developed and widely used in practice.

In almost all developed countries, especially in the field of medicine, artificial intelligence technologies have been promoted and widely used. The need for this trend is growing. Research and analysis show that the United States, Europe, and India have the highest number of Chatbot users.

Most countries' digital responses include a combination of big data analysis, integration of national health insurance databases, tracking travel history from person location databases, code scanning, and online person reporting. What is lacking in the COVID-19 pandemic around the world is an integrated approach to digital health governance. Bulk surveillance and contact tracing that collect

personal data should not be used by government agencies without public scrutiny, but should be associated with contactless anonymized digital health technologies.

In the Republic of Uzbekistan, digital solutions for tracking contacts with AI, including chatbots, are still under development. Although a number of options for mobile COVID-19 contact tracing applications have been proposed, they have not been able to find their place in the official anti-epidemic measures of the Uzbek government to combat the spread of infection. Nevertheless, the effective possibilities of such digital solutions for the epidemiological prevention of infection at the level of communities, cities and countries are beyond doubt.

Digital chatbots using AI can become a tool in the fight against COVID-19 and similar pandemics. However, from the above literature review of the current state of the art note that AI systems are still in preliminary stages, it will take time before results are seen. Very few of the examples and models of digital Chatbot solutions we've reviewed have operational maturity at the given stage.

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CREDIT - MODULAR SYSTEM AND ITS PRINCIPLES OF IMPLEMENTATION (IN TEACHING MATHEMATICS IN HIGHER EDUCATION INSTITUTIONS)

T. Ismailov

Abstract: This article analyzes the theories of application of credit-modular system in higher education institutions of Uzbekistan, teaching mathematics and their importance, in which the content and essence of the credit-modular system, priorities, and the work done in the transfer of the system to this system, as well as the author's recommendations and opinions in this regard are presented on a scientific basis.

Keywords: Credit-modular system, module, modular teaching technology, credit, credit teaching technology, credit-modular system in teaching mathematics.

КРЕДИТНО-МОДУЛЬНАЯ СИСТЕМА И ПРИНЦИПЫ ЕЕ ОСУЩЕСТВЛЕНИЯ (В ПРЕПОДАВАНИИ МАТЕМАТИКИ В ВУЗЕ)

Исмаилов Т.

Аннотация: В данной статье анализируются теории применения кредитно-модульной системы в высших учебных заведениях Узбекистана при обучении математике и их значение, в которых раскрываются содержание и сущность кредитно-модульной системы, приоритеты и работа, проделанная при переходе к этой системе, а также авторские рекомендации и мнения по этому поводу представлены на научной основе.

Ключевые слова: кредитно-модульная система, модуль, модульная технология обучения, кредит, кредитная технология обучения, кредитно-модульная система в обучении математике.

Introduction

The proposed article focuses on the introduction of a credit-modular system in the teaching practice of higher education in Uzbekistan, based on the experiments of developed countries, and the introduction of this system in the teaching of mathematics. First of all, we need to clarify the concepts to be discussed. After all, the English philosopher Francis Bacon, who lived in the Middle Ages, said that the key to resolving strong conflicts is to logically analyze each terminology in the problem. Being able to fully explain them to others will solve the problem in advance.

In the context of the coronavirus pandemic, unprecedented changes are taking place in all aspects of human life. These series have also led to the "cracking" of long-established values, traditions and principles. In particular, the forecasts of leading scientists and experts of international organizations on the threats to the development of the Kurrai land in the near and medium term have not been confirmed. On the contrary, they are being reconsidered. But one thing is clear: as long as the world does not act as a whole, it is inevitable that man will fall victim to a very dangerous situation. The only way to salvation is to direct the accumulated knowledge, skills and conclusions to a common goal, to be able to effectively combine science and experience.

The formation of knowledge and science is directly related to the education system. The effectiveness of the education system is directly ensured by the level of teachers, student needs, the content of textbooks, and the infrastructure for the formation of independent learning. Thus, the training

of advanced personnel, increasing their competitiveness in accordance with the requirements of the labor market, the training of creative professionals are closely linked with the educational process in educational institutions.

On October 8, 2019, the President signed the Decree "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030." This important policy document states that "at least 10 higher education institutions in the country should be included in the list of the top 1,000 higher education institutions in the ranking of internationally recognized organizations (Quacquarelli Symonds World University Rankings, Times Higher Education or Academic Ranking of World Universities) and study in higher education institutions, gradual transition of the process to a credit-modular system".

In addition, by 2030, 85% of all higher education institutions (HEIs) in the country, including 33 higher education institutions in the 2020/2021 academic year, will be transferred to the credit-modular system.

The credit-modular system is a process of organizing education, a model of assessment based on a set of modular technologies of teaching and credit measurement. Carrying it out as a whole is a multifaceted and complex systemic process. The credit-modular principle focuses on two main issues: ensuring the independent work of students; assessment of students' knowledge on the basis of rating.

The main tasks of the credit-modular system are:
- modular organization of educational processes;
- Determining the cost of one subject, course (credit);
- Assessment of students' knowledge on the basis of rating points;
- allowing students to create their own curricula individually;
- increase the share of independent learning in the educational process;
- The convenience of educational programs and the possibility of changing them depending on the demand for specialists in the labor market.

The purpose of the course is not only to teach on the basis of innovative educational technologies, but also to teach students to study independently, to take a new approach to education, to acquire the necessary and in-depth theoretical knowledge and practical skills based on labor market demand. In short, the system is focused on the professional development and maturity of the student. It is aimed at ensuring the lifelong learning of the scientist and the formation of human capital that can meet the labor market and modern requirements.

The credit-modular system is a system aimed at independent learning and the creative acquisition of knowledge on an individual basis, the choice of the educational path with a firm definition of the educational process and the

determination of the amount of knowledge in the form of credit. This system is now common in the education system of developed countries, has proven itself in time-tested and is different from each other, but complementary - modular and credit teaching technologies formed by merging.

Methods

A module is a separate course (or part of a course) that includes relevant knowledge and professional information. The modular system of teaching ends with the appropriate type of control of knowledge, skills and competencies that is formed as a result of the student's study of the science program. For example, current, intermediate, and final examinations are conducted to ensure that students' levels of knowledge and mastery are in line with state educational standards.

Modular learning is systematic learning. In this case, the educational material can be taught in the volume of a single lesson, at the level of any subject or section of the subject, and sometimes in a large component of the subject, ie in the form of blocks said Ikhtiyor Juraev, head of the teaching department at Tashkent State Law University. - The modules, first of all, effectively serve to explain the concepts, rules, theories, laws and laws that represent the general relationship between them, related to the content of education. In modular education, the teacher organizes, manages, advises and checks the process of mastering the listener. The student, on the other hand, focuses on independent learning towards the target object [2].

The academic credit system is a standardized assessment system that determines a student's ability to study effectively in higher education. Credit - consists of the time (hours) spent by the student to complete the relevant academic work. Each module has an independent credit account. The institution of higher education independently determines the credit structure, the number of credits for each module, as well as the total number of credits that must be collected by the student to complete each course and the entire period of study. Another distinctive feature of the academic credit system is the compliance of universal education programs with international general education standards and the problems of adopting educational documents, taking into account global trends. Students will have free access to university education in foreign countries, and bachelor's and master's degree graduates will have the right to work in any country.

A **module** is a part of a curriculum that covers several subjects and courses. It is a set of several courses aimed at developing students' knowledge and skills, analytical and logical observation. In doing so, the teacher organizes the learning process, gives live, video and audio lectures,

coordinates and monitors the student's activities. The student will study the topic independently and complete the assignments.

According to foreign experience, the educational process in the credit-modular system consists of 2-4 modules per semester. The disciplines covered in the module are easily developed from complex theoretical to practical sciences, and logically complementary. In order to become a professional, a student needs to have not only information, but also the ability to process it and put it into practice.

Module-based curricula are developed on a case-by-case basis and include:

- full disclosure of learning objectives and tasks;
- Requirements for the qualifications of the student to be acquired at the beginning and end of the subject (course);
- A summary (syllabus) of each subject included in the module, ie topics of lectures, plans of seminars and practical classes, assignments for the assessment of independent learning;
- Summary of teaching: methods and tools of teaching; methods and forms of knowledge assessment.

The module-based education system uses a rating system to assess students' knowledge, skills and abilities. It assesses all of a student's learning activities, including in-class and out-of-classroom learning.

Each student must collect credits in order to receive a diploma in their chosen field and specialty in the future. Accumulated credit will help the student to improve his / her skills or get a higher education throughout his / her life. In economic terms, the accumulated credit becomes the student's academic "asset."

Credit technology gives learners the right to choose the elective subjects included in the working curriculum, thereby directly participating in the development of the individual curriculum. They are given the freedom to choose not only subjects but also professors. Giving students the opportunity to choose subjects is a positive thing. It is also an indicator of the value of learning.

History and reason.

Credit was first introduced in US universities in the 18th and 19th centuries to liberalize the learning process and to determine the student's weekly academic workload.

In 1869, Charles William Eliot, president of Harvard University and a prominent figure in American education, introduced the concept of "credit hour". Thus, between 1870 and 1880, a system of credit hours was introduced. The credit system and the mastery of the curriculum allowed students to

independently plan the learning process, control its quality, and improve educational technologies.

The introduction of the credit accrual measure not only gave the student greater freedom, but also allowed him to independently plan the academic process so that he could become a competitive professional in his chosen field in the future. At the same time, it has led to improvements in the assessment system and educational technology.

As stated in the Bologna Declaration, the credit-modular system serves two main functions, focusing on independent learning:

the first is to ensure the mobility of students and teachers, i.e. the free movement (transfer of study or work) from one higher education institution to another without hindrance;

second, the academic load - the credit - is clearly calculated for all the academic and research activities of the student in the chosen field of study or specialty. The sum of the credits shows how much the student has earned according to the chosen program.

Bologna Declaration: Prescription.

Today, we hear from those involved in the education system a variety of opinions about the Bologna system and its importance.

So what kind of system is this? What are its advantages and disadvantages?

We will continue our thoughts as a logical continuation of the theme.

To create this system, the integration of all higher education institutions in Europe since the 1970s, the creation of a single standard of higher education, the mobility of students and teachers, the recognition of diplomas, and the unification of scores for students' knowledge, skills and abilities have been addressed.

As a result of these efforts, the Bologna Declaration was signed in 1999 in Bologna, Italy by representatives of 29 countries.

To date, 48 countries are participating in the Bologna process. Among the CIS countries are Russia, Ukraine, Azerbaijan, Moldova, Armenia, Georgia, Kazakhstan and Belarus.

The training of highly qualified personnel under the Bologna system is carried out in two stages. Usually a bachelor's degree of at least three years and a master's degree of 1-2 years.

Many experts oppose the Bologna Declaration's ability to attract talented students, the competition with the United States to value their knowledge in the labor market, the limited capacity of European higher education institutions, and the tendency of many 'intellectuals' to leave the continent and emigrate to the United States.

Discussion

Why European education is a priority?

Today, there are four common models for implementing this credit rating system.

These are the United States Credit System (USCS); European credit system (ECTS); Asia-Pacific Credit System (UCTS); UK Credit System (CATS).

The most common of these models are the US and European models.

According to the information, the Ministry of Higher and Secondary Special Education of the country prioritizes the use of the European ECTS system in the introduction of the credit system. Therefore, we consider it appropriate to dwell on its advantages, and disadvantages.

One of the most important aspects of the Bologna Declaration is the use of a single "credit system" (ECTS) by higher education institutions. A credit or unit of credit is an indicator of the value of any learning activity included in the curriculum.

The ECTS system offers great benefits to students in Europe and the Bologna Process in general.

For example, it guarantees that the academic knowledge acquired at the university where the student is studying will be recognized in the higher education institutions of the member countries of the system. At the same time, the system allows members to resume, transfer and terminate their studies at another university.

The ECTS system also offers a number of benefits to universities. In particular, it ensures the similarity and uniformity of curricula that accurately reflect information about the learning process in a particular field of study and specialization. It also allows the content of the higher education program to be agreed upon in advance in order to achieve recognition of the degree. The student retains responsibility and independence in resolving all issues related to education. In the European education system, courses and the entire educational process are calculated on credits, and in Uzbekistan and other CIS countries on academic hours.

Under the ECTS system, each institution of higher education independently determines the composition of credits, the number of credits for each module, as well as the total amount of credits that a student must collect to complete each course and the period of study in general.

In contrast to the current curriculum, in addition to the compulsory subjects in the credit system, elective subjects are also included in the student's individual course schedule. Students will not be expelled or dropped from course to course. If he/she is not able to collect credits from any subject

(course), he/she will only have to retake the exam in that subject. Higher education diplomas are awarded upon completion of the required credits.

According to the ECTS system, the amount of credit that students have to accumulate in a year is 60. Assuming that one academic year consists of two semesters, a student must earn 30 credits per semester. If the bachelor's program is 3-4 years, the student is required to collect a total of 180-240 credits to obtain a bachelor's degree, and 60-120 credits to complete a 1-2-year master's program.

What was the situation in Uzbekistan like?

As you know, we have limited access to information sources and various international databases. As a result, in higher education, professors have focused on finding information, assimilating it, and disseminating it to students after initial processing. That is, teachers were merely the subject of receiving and transmitting information.

In this case, the student acts as a receiver of information as an object of the educational process, spending most of his time listening to lectures in the classroom. Today, the development of independent student education is on the agenda due to the acceleration of access to information, the expansion of access to international scientific and technical databases, and the acceleration of globalization.

Curricula of specialties were supplemented by subjects not related to the labor market, mainly in terms of the principle of employment of professors and teachers, as well as the distribution of subjects by mutual agreement of the heads of departments.

The student was not only allowed to choose subjects and professors, but also to give up boring classes and study in the library. Student truancy was considered a serious loss, with warnings of more than 30 hours per semester and expulsions of more than 74 hours per semester. The student had to sit in the auditorium, whether he liked the subject or the teacher, whether the knowledge was left behind or not!

Thus, in the traditional system, no materials were provided on what knowledge the student would acquire in the future, what professors and teachers would teach, the profile of the direction, and a summary of the subjects.

However, all information on the direction of education and specialties in all higher education institutions of developed countries, in particular, a brief syllabus of subjects reflected in the curriculum (subject identification, teacher information, lesson description, purpose of the subject, learning outcomes, teaching methods, science plans, literature, assessment methods), professors and teachers in the field of science and their achievements, a brief description

of the requirements for a specialist in the labor market, i.e. what theoretical, practical knowledge, skills and professional qualifications are available on the official website of the university will be announced. At the same time, unfortunately, applicants find it difficult to find this information on the websites of our universities. In this regard, the time has come to form a culture.

ECTS requirements: initial steps.

As noted above, the first steps are being taken to move away from the negative aspects of the traditional education system and to work within the requirements of international standards.

At present, 33 higher education institutions of the country are actively working on the transition to a credit-modular system. All forces are being mobilized to create this system.

An example of this is the fact that the El-Yurt Umidi Foundation regularly organizes seminars in foreign higher education institutions for citizens who are engaged in research and teaching activities, and who are familiar with the credit-modular system. In addition, one of the members of the International Council of Experts under the El-Yurt Umidi Foundation has been appointed as an expert advisor to 10 self-funded higher education institutions.

In order to fully implement these processes, the relevant departments of the higher education institution are being established.

In particular, the Tashkent State University of Economics has a Department of Education Credit Management. From the 2020/2021 academic year, the department has begun work on the full transformation of all areas of education and specialties taught at the university into the ECTS credit-modular system.

Results

Has the transformation process begun?

According to preliminary estimates, the university allocates 15 weeks per semester for undergraduate studies and 6 weeks for certification (3 weeks per semester for exams). Thus, the number of study weeks in 4 years is 144, certification is 24 weeks, and the total number of holidays is 204 weeks. Curricula for all disciplines and specialties are divided into two parts at each stage: basic and elective. Based on the ECTS requirement, it is planned to oblige the student to collect a total of 240 credits over 4 years out of 60 credits per year. In this case, the student will have to spend 2880 hours for 4 years of lectures, practical and laboratory classes and examinations, 4320 hours of independent study, a total of 7200 hours.

In our example, 1 credit = 12 academic hours + 18 hours of independent study. Therefore, 1 credit is considered to be equal to 30 hours and the student's weekly classroom load is equal to 20 hours. The amount of credit allocated for the internship is intended to be paid for by the relevant subject or disciplines.

What changes will take place during the transition to the new system?

The introduction of this system in higher education will improve the quality of teaching, ensure transparency, eliminate corruption, reveal the true knowledge of the learner and allow the student to study and work independently. Today, the European credit system is practiced in almost all higher education institutions of the ancient continent.

The introduction of a credit-modular system is an important factor in teacher-student collaboration. In modular education, the teacher organizes, manages, advises and checks the process of mastering the listener. The student moves independently towards the directed object. The greatest emphasis is placed on students' independent learning.

The importance of independent learning in the learning process will increase, which in the future will increase the independence, creative initiative and activity of professionals. In the credit-modular system, university students always have the opportunity to receive support and advice from teachers and classmates. This strengthens mutual understanding and helps to develop teamwork skills.

The transition to a credit-modular education system will also increase the commitment and demand for university professors. As noted above, with a modular learning system, the teacher not only serves as an informant and supervisor, but also as a consultant and coordinator. The leading role of the teacher in the pedagogical process is preserved.

One more thing. The credit system of education increases student exchange. This is because loans taken from one university are credited to another, and students can transfer from one university to another without losing credit. It is this system that allows Uzbek students to continue their studies at advanced foreign universities and remove complex bureaucratic barriers.

However, it should be noted that the blind and direct application of any international experience, without taking into account our values, without in-depth analysis of each of its elements, based on scientific evidence, can lead to certain negative consequences in the future.

This does not mean that this system is fully consistent with our worldview, conditions, and values aimed at raising a harmoniously developed

person. Therefore, we need to change the views of professors and students, who are active elements of the educational process, to absorb the requirements of this system, to form a unique culture.

After all, if we do not train personnel in accordance with the requirements of the labor market, we must feel that we will inevitably lose our place in the competition. But there is no better way or choice. After all, higher education institutions in all developed countries are following this path and achieving high results.

Once our traditional higher education system is not recognized around the world, we will have to apply advanced standards and systems to higher education institutions. Therefore, the pursuit of innovation and the continuation of efforts to radically reform the higher education system are the right decisions in all respects.

Why is it necessary to introduce a credit-modular system in the teaching practice of higher education in Uzbekistan?

We will find the answer to this question by pointing out the obvious shortcomings of our traditional system, which is still used in practice in higher education in Uzbekistan.

- The inability of the traditional system, which is still used in higher education in Uzbekistan, to meet the requirements of the current information age;
- In the universities of Uzbekistan, students remain mainly listeners, as a result of which the staff trained due to poor practice does not give good results in the field;
- The large number of gaps in the evaluation system, and as a result, corruption in the evaluation process;
- Weakness of student innovation. That is, in this system, the student is given a task, and the student completes it and receives an assessment. Less emphasis is placed on student creative, independent work;
- The most important thing is that this system is not compatible with the developed education systems of the world. That is the main reason why we are not ready to compete with them.

In this context, we need a loan based on world experience to strongly reform the activities of Uzbek universities, to include them in the list of prestigious universities in the world, to develop perfect structures for free and creative education, to implement quality education that fully meets international standards.

So, what has been done in the education system of Uzbekistan in this regard? On October 8, 2019, the President of the Republic of Uzbekistan signed a decree "On the system of higher education of the Republic of

Uzbekistan." Decree PF-5847 "On approval of the Concept of development until 2030" was made. Accordingly, from 2018 to 2019, the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi transferred to a credit-modular system. It is also planned to increase the number of universities with a credit-modular system from 2 to 85. The number of non-governmental, public-private partnership universities will be increased to 35. The decree also emphasizes the need to replace theory with practical skills. At present, up to 40% of our education is allocated for independent study, but according to the concept, this figure will increase to 60% by 2030 [3].

Now, I want to ask a question that explains the essence of our article.

Exactly why it is necessary to introduce this system in the teaching of mathematics?

Conclusion

We all know that the sciences that teach mathematics require strong thinking and reasoning. Teaching these subjects is a more complex process than teaching other subjects. The introduction of a credit-modular system in higher education institutions for the teaching and learning of these subjects will significantly increase the effectiveness of education, create the basis for the practical application of mathematics. It will allow higher education institutions teaching mathematics in Uzbekistan to establish cooperation with prestigious mathematical universities around the world.

What are the benefits of the transition to a credit-modular system for students in mathematics?

First, academic mobility means that students can easily transfer to any suitable university while retaining their credits. It doesn't matter if it's a world university or any of our universities. All you need to do is give them an outlet and the support they need to keep going.

Second, students are given the freedom to choose a teacher. This ensures academic communication between teacher and student.

Third, students will be able to choose subjects based on their preferences. Of course, there are (compulsory) subjects that must be studied, but the student can determine the subjects of independent choice. For math students, this is exactly the point. This is because it gives them enough time to master the sciences.

Fourth, students will be able to independently formulate their curriculum and ensure the transparency of their assessments. This will automatically eliminate corruption in the education system.

Unlike the current system of education, in addition to the compulsory subjects, the credit system includes elective subjects and a student's personal

lesson schedule. Students will not be expelled or transferred from course to course. If you do not collect the required credits in the subject, you will have to re-study and retake the exam in the same subject. Re-reading is a series of lectures, labs, and workshops from the first lesson to the last. Re-tuition is paid. Its loan amount is calculated based on the contract amount. A diploma of higher education is issued only after the accumulation of the specified credits. At the end of the semester, 50% of the students' marks are given by the science teacher and 50% by the university administration. That is, during the semester, mid-term examinations, homework assignments and practical (laboratory) work are evaluated by professors and teachers. The final control will be taken by the university administration. There is no teacher-professor. According to experts, in order to collect credits, students are required to attend classes, complete tasks on time, demonstrate their level of knowledge.

What needs to be done to transfer higher education institutions in Uzbekistan to the credit-modular system? (My recommendations).

First of all, it is necessary to develop a regulation on measures to radically improve and increase the efficiency of the system of training in higher education institutions, developed by the Ministry of Higher Education for each university.

And on this basis, to develop a systematic curriculum based on the practice of foreign universities in order to ensure the intensity of education.

One of the biggest advantages of the credit-modular system is the introduction of reasonable reduction of subjects in all universities.

For example, the Muhammad al-Khwarizmi Tashkent University of Information Technology previously had 43 subjects in the curriculum, but after the introduction of the credit-modular system, their number decreased to 31.

Ensure that the university creates a special site for the student's independent work, homework and laboratory assignments.

On this site, students download the tasks in the given order, and the teacher defends it orally. In this case, the student's rating is set deadline both online and by the teacher. Students who do not submit independent work and homework on time will not be evaluated. There is no re-submission in this system. Can only be re-read.

At the end of each semester for students in the field of mathematics to organize control and test assignments based on world standards and to organize the strengthening of students' knowledge on their basis.

This will ensure that our students are able to meet world standards.

To teach students the skills of using special mathematical utilities (MATlab, MATHcad, geogebra…) in mathematics and to create conditions for their widespread use in practice.

From a scientific point of view, this will help them to complete calculations more quickly and to develop a wider range of mathematical concepts.

Provide a wide range of library resources to all universities in both print and electronic formats.

Of course, it takes enough time for our students to adapt to such a system. Preparing them for this is, first of all, the task of pedagogical teachers. Therefore, in order to form such a system, first of all, it is necessary to provide universities with professional and highly qualified teachers.

At the same time, the educational credit-modular system requires consideration of the principles of improving the organization of the educational process, control over students' knowledge, financial incentives for teachers and professors of higher education institutions and improving wages. In addition, it is important that students are provided with textbooks and materials, that the current standards meet the requirements of the education credit system, and that there is a personal press center equipped with modern equipment and reproduction techniques. I am convinced that the introduction of such a system in the education system of Uzbekistan will be a major turning point in the development of all sectors of our country. After all, educated and creative personnel from higher education are the foundation of the future of our country.

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II. ВОПРОСЫ ПОВЫШЕНИЯ КАЧЕСТВА ВЫСШЕГО ОБРАЗОВАНИЯ

INNOVATIVE METHODS AND TOOLS IN HIGHER EDUCATION: THE USE OF ICT AS AN ADVANCED LEARNING AND LEARNING METHODS IN ORGANIZING THE EDUCATIONAL PROCESS

Z. Umarova

Abstract: In this article, options for using information and communication technologies are considered as the main way to implement the idea of increasing the effectiveness of education and developing professional pedagogical competencies among future personnel. The present situation of the education system is studied, the difficulties of implementing the idea of using information and communication technologies and cooperation as the main means of developing the professional pedagogical competencies of future personnel are considered, and effective methods and mechanisms of action are also identified.

Methodologically, the importance of using information and communication technologies in the educational process lies in the fact that digital resources are suitable for any form of education, which allows the use of new, non-traditional methods of studying the material. They play an important role in solving complex problems, such as the activity of students, enthusiasm and interest, motivation for learning, the ability to see the results of their activities and adequately evaluate them.

Key words: Innovations in education, information and communication technologies, ICT in education, professional readiness, teacher training, competence development, teacher competence.

OLIY TA'LIMDA INNOVATSION USUL VA VOSITALAR: TA'LIM JARAYONINI TASHKIL ETISHDA ILG'OR TA'LIM VA TA'LIM USULLARI

Umarova Z. A.

Annotatsiya: Ushbu maqolada axborot-kommunikatsiya texnologiyalaridan foydalanish imkoniyatlari ta'lim samaradorligini oshirish va bo'lajak kadrlarda kasbiy pedagogik kompetensiyalarni rivojlantirish g'oyasini amalga oshirishning asosiy yo'li sifatida ko'rib chiqiladi. Ta'lim tizimining hozirgi holati o'rganilib, axborot-kommunikatsiya texnologiyalaridan foydalanish g'oyasini amalga oshirish va bo'lajak kadrlarning kasbiy pedagogik kompetensiyalarini rivojlantirishning

asosiy vositasi sifatida hamkorlik qilishdagi qiyinchiliklar ko'rib chiqilgan, shuningdek, samarali usullar va harakat mexanizmlari aniqlangan.

Uslubiy jihatdan ta'lim jarayonida axborot-kommunikatsiya texnologiyalaridan foydalanishning ahamiyati shundan iboratki, raqamli resurslar har qanday ta'lim shakliga mos keladi, bu esa materialni o'rganishning yangi, noan'anaviy usullaridan foydalanish imkonini beradi. Ular talabalarning faolligi, ishtiyoqi va qiziqishi, o'qishga bo'lgan motivatsiyasi, o'z faoliyati natijalarini ko'ra bilish va ularga munosib baho bera olish kabi murakkab muammolarni hal qilishda muhim rol o'ynaydi.

Kalit so'zlar: Ta'limdagi innovatsiyalar, axborot-kommunikatsiya texnologiyalari, ta'limda AKT, kasbiy tayyorgarlik, o'qituvchilarni tayyorlash, kompetentsiyani rivojlantirish, o'qituvchi kompetentsiyasi.

Introduction

Modern production makes high demands on personnel and the system of training, advanced training and advancement in the conditions of market relations. In the course of scientific and technological progress, some professions die off, others appear, others are modified, the labor rhythm becomes denser, technical means change. All this gives rise to the need for new forms of training and advanced training of personnel [1].

The quality of personnel training for professional activities depends on many factors: the quality of the scientific and pedagogical potential of educational institutions; the quality of the curriculum and the means of the educational process (material and technical, experimental base; educational and methodological support; audiences used; knowledge provided, etc.); the quality of applicants as well as the motivation of students and so on. Among the above listed, an important factor is the effectiveness of the educational technologies used in the training process.

As K.K. Platonov noted, "professional training of a specialist is a subjective state of a person, that is, he considers himself capable and ready for the corresponding professional activity" [2].

We can say that vocational training is a learning process aimed at accelerating the acquisition of knowledge, skills and competencies by students necessary to perform a certain job or group of jobs, so that they can work in a certain field of activity.

Sometimes the concept of professional training is defined by the concept of professional competence, which in a general sense is the formation of professional readiness, a steady focus on the performance of work tasks. Professional competence is not only the result, but also the goal of vocational training, which is

carried out through a certain systematization of the content of vocational and pedagogical education and has four components.

An analysis of studies conducted by foreign and domestic researchers on the training of future teachers allows us to draw the following conclusion: "readiness is the ability of a specialist to find optimal solutions to various situations that may arise in his professional activity and professionally perform any functional tasks" [3, p. 258].

Considering the teacher's competence as a factor of his readiness, we defined it as readiness and ability for professional pedagogical activity. Such a definition allows us to interpret the concepts of "professional pedagogical readiness" and "professional pedagogical competence" as synonyms.

Methods

As Aristotele said: "The mind consists not only in knowledge, but also in the ability to apply knowledge in practice." Despite the fact that this idea appeared a long time ago, it has recently been actively used in modern pedagogy. ... Until recently, the level of graduate training was considered as the presence of certain knowledge, skills, and in the new conditions, this view is understood as the formation of certain general professional and professional competencies among students. Thus, a student's professional and pedagogical education is considered as a holistic system process only when the ability to form a holistic algorithm for performing a non-standard task using elements of knowledge and skills acquired to date to solve typical problems of pedagogical activity is realized. From this we can conclude that readiness is the ability to form elements of knowledge and skills acquired at the moment for solving typical tasks, in the form of a holistic algorithm for performing a non-standard task [4, p. 3537].

In traditional learning, teachers often allow students to dominate the group or depend on the group. In traditional learning, individual accountability is often neglected so that tasks are often done only by one member of the group, while other members are relatively passive or just above the success of their friends who do the task. In traditional learning, in general the study groups formed are homogeneous. In traditional learning, the group leader is often determined by the teacher or the teacher allows each group to choose its leader in their own way. In traditional learning, social skills are often not taught directly. In traditional learning, monitoring through observation and intervention is often carried out by the teacher when group learning is taking place. In traditional learning, teachers often do not pay attention to the group processes that occur in study groups. In traditional learning, there is often more emphasis on completing tasks [5, p.13].

The fundamental difference between the modern education system and the traditional one lies in the specifics of its technological component: modern

education uses a rich arsenal of new information technologies that open up new opportunities for improving the pedagogical process as a whole [6].

It is no secret that in today's market economy, the development of our society requires new technologies, including new information and communication technologies. In particular, the widespread introduction of multimedia and web technologies, and the intensive study of computer-generated graphics, animation and video technology require computer literacy. In recent years, Uzbekistan has taken some measures to develop computerization and information and communication technologies [7, p. 943].

An analysis of scientific research on the problem of informatization of the educational industry led to the conclusion that the basis of pedagogical activity using ICT tools is theoretical knowledge, practical skills and the need for analysis and self-improvement in professional achievements [6].

This approach allows professional training to be turned into an active and purposeful activity, in this process, existing and newly received information is reprocessed, external random, secondary elements are separated from the main ones, the essence of the situations under study is reflected, and logical connections between them are revealed.

The development of professional pedagogical training of future teachers requires the preparation of educational materials aimed at creating a potential opportunity for the targeted formation of professional pedagogical training of students, and requires the use of organizational forms, methods and techniques that affect the most active mastery of all components of the educational process, the development of creative abilities, self-learning new knowledge. Systematic improvement of the content of the prepared educational materials should be carried out using the following methods: systematic analysis, modeling, synthesis, delegation and forecasting of fixed and variable components of educational materials.

The results of the latest achievements in the field of systems theory and "environmental" approach to education and upbringing, the patterns of open, self-organizing and self-evolving educational system performs general methodological bases of pedagogical projecting. These bases provide a range of its features: continuous and cyclical nature of projecting in education, aimed at solving vital problems of the educational system, the base of humanistic, comprehensiveness, consistency and typological pedagogical projecting of adequate integrity and socio-cultural distinctiveness of educational phenomena and processes [8, p.47].

Results

Choosing an innovative type of development, creation and implementation of high technologies, the growing role of information and knowledge in social and economic development of the country generate massive demand for highly skilled

professionals. This requires the development of new, innovative forms of learning and education has set priorities among a new generation of teachers able to prepare competitive specialists [8, p.46].

In the present study, mixed research methods were applied using a variety of tools and techniques in the intervention according to the research design. Different techniques and instruments highlighted similar results in several categories. The study proposed three dimensions to address the objectives of the research [6].

The inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT materials within the school. It may be the result of one of a number of factors such as poor organization of resources, poor quality hardware, inappropriate software, or lack of personal access for teachers. The level of access to ICT at school is defined as teachers' access to infrastructure, provision shortages and inadequacy, and teaching time using ICT [9, p.32].

The use of ICT in education, especially media resources that are products of digital technologies, further expands the opportunities for students to improve their knowledge of the subject, increases the effectiveness of learning. This, in turn, directly serves to increase students' interest and motivation for learning.

"Some students enjoy learning and acquiring knowledge through direct reading, some through listening comprehension, and still others through watching (video)" [10]. With this in mind, the organization of education using ICT, as the author notes in [10], "… provides a wider array of data than a traditional data source; use not only text, graphics, diagrams, but also sound, animation, video, etc.; allows students to consistently select the types of information in accordance with their level of perception and logical learning.

Distinctive features of the digital media educational environment are:
• Include various forms of information: text, images, tables, audio recordings, videos, animations, infographics, etc.;
• based on digital technologies, ie. involves the direct participation of digital technologies in the creation, storage, processing and use of educational resources;
• In the process of interactive communication between students and digital technologies, a wide range of information will be available, which will improve the conditions for self-study;
• digital media learning environment allows you to create individual educational trajectories, taking into account the psycho-physiological characteristics, individual characteristics and interests of each student;
• Assumes the transition from learning in the classroom to learning anywhere and anytime.

The creation of a digital media learning environment allows students to continue the learning process even at home, independently study subjects,

consolidate knowledge and communicate remotely with teachers. This will help to conduct distance learning in an interactive form in modern conditions, even during holidays in educational institutions of Uzbekistan.

Methodologically, the importance of using information and communication technologies in the educational process lies in the fact that digital resources are suitable for any form of education, which allows the use of new, non-traditional methods of studying the material. They play an important role in solving complex problems, such as the activity of students, enthusiasm and interest, motivation for learning, the ability to see the results of their activities and adequately evaluate them.

Discussion

University teachers should be involved in the formalization of knowledge as a tutor. E.Potulickal notes that university professors should only help students to develop themselves, make them capable of continuous learning and self-education. There is no doubt, under such circumstances, it is possible to acquire knowledge on your own, but the quality of this knowledge will depend entirely on the student. However, at this case, as we noted before, the system of higher education, more preciously, university teachers' should stimulate students to implement the process of self-education, providing them with the necessary pedagogical support in this matter [11, p.5].

It is no coincidence that there is a growing interest in creating a digital educational environment and the use of information and communication technologies in the educational process, as they provide an opportunity for digital learning, the creation of a media environment and media resources, the organization of the educational process anywhere in the world, the implementation of remote interactive communication between teachers and students outside classes, easy and convenient receipt of educational information, taking into account the individual pace and characteristics of learning, and more. Achieving independent and active participation of students in the process, making education interesting and attractive for students, and, as a result, increasing the effectiveness of education to a new qualitative level. Therefore, the introduction of information and communication technologies into the educational process today is one of the most important tasks of teachers.

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СОВЕРШЕНСТВОВАНИЕ ИНФОРМАЦИОННО-БИБЛИОТЕЧНОГО ОБРАЗОВАНИЯ В БАКАЛАВРИАТЕ: ИННОВАЦИОННЫЕ ПОДХОДЫ И МЕТОДЫ

Аракелов С.Р.

Аннотация: В данной статье отражается часть исследования и обсуждается необходимость использования в бакалавриате инновационных технологий в преподавании информационно-библиотечных дисциплин. Предлагается, с учётом современных требований, применение современных образовательных подходов и методов в подготовке высококвалифицированных библиотечных специалистов.

Ключевые слова: инновационные методы в обучении, информационно-библиотечное образование 4.0., компетентностный подход, цифровая трансформация образования.

IMPROVEMENT OF LIBRARY AND INFORMATION EDUCATION IN BACHELOR STUDIES: INNOVATIVE APPROACHES AND METHODS

S. Arakelov

Abstract: This article reflects part of the research and discusses the need to use innovative technologies in the teaching of information and library disciplines in undergraduate studies. It is proposed, taking into account modern requirements, the use of modern educational approaches and methods in the preparation of highly qualified library specialists.

Keywords: innovative approaches in teaching, library and information education 4.0., competence-based approach, digital transformation of education.

Введение

В современных зарубежных научных исследованиях, диссертациях рассматриваются различные методики совершенствования профессиональной подготовки специалистов. Зарубежные образовательные технологии в деятельности совершенствования подготовки информационно-библиотечных специалистов рассмотрены в трудах учёных (Bouchard P., Simmons M., Gettman, S. L., O'Keeffe-Foley J., Лопатина Н.В., Сляднева Н.А., Гендина Н.И., Редькина Н., Гордукалова Г.Ф.)

Исследования учёных зарубежных стран способствовали развитию системы подготовки высококвалифицированных информационно-библиотечных специалистов в Узбекистане и нашли отражение в трудах

отечественных учёных и практиков (Касимова А.Г., Есимов Б., Расулов М.М., Умаров А.А., Рахимова М.А., Турапов М.М., Шамсиев Ш.М., Махмудов М.Х., Якубова М.З., Каримов У.Ф., Рахматуллаев М.А. и др.). Разработка и внедрение систем компетенций библиотечного специалиста, на наш взгляд, в условиях процесса цифровизации общества даст необходимый импульс в организации и развитии информационно-библиотечного образования.

Одним из главных приоритетов должна быть поставлена задача подготовки компетентных специалистов, способных к самостоятельной работе в современных условиях уже в процессе обучения на старших курсах. Перед профессиональным сообществом высшей школы стоит особая задача - сделать образование стратегически ориентированным, т.е. отвечающим на современные вызовы социального развития [22]. Компетентностная функция библиотекаря нового поколения позволяет предложить новые ориентиры профессиональной подготовки, поставить задачу формирования востребованных временем компетенций на основе компетентностного подхода.

Основная часть

Цель исследования. Изучение и применение инновационных подходов и методов в информационно-библиотечном образовании.

Исследование состояния подготовки будущих библиотечных специалистов в высших образовательных учреждениях, содержание информационно-аналитической компетентности библиотечных специалистов, и изучение международного опыта в вопросе оценки информационно-аналитической компетентности библиотечных специалистов в развитых странах - всё это необходимо, на наш взгляд, для эффективной образовательной деятельности в процессе подготовки будущих библиотечных специалистов в информационно-библиотечной сфере.

**Процессы подготовки библиотечных специалистов в высших
образовательных учреждениях**

Во исполнение постановления Президента Республики Узбекистан от 11 июля 2019 года № ПП-4391 «О мерах по внедрению новых принципов управления в систему высшего и среднего специального образования» была разработана Концепция развития системы высшего образования Республики Узбекистан до 2030 года, одной из основных задач было определено «расширение возможностей использования студентами, преподавателями и молодыми исследователями мировых образовательных ресурсов, электронных каталогов научной литературы и баз данных путем внедрения современных информационно-коммуникационных технологий» [1].

В Ташкентском университете информационных технологий имени Мухаммада аль-Хорезми (ТУИТ) на протяжении нескольких лет проводится

реформирование существующей системы высшего образования с переходом на кредитно-модульную систему обучения, что предполагает кардинальную смену всей парадигмы образования и более тесную связь "образование-наука-производство-цифровая экономика". Перед информационно-библиотечным сообществом Узбекистана стоит дилемма, по какому профессиональному пути двигаться вперёд, какими ключевыми компетенциями должны владеть библиотечные специалисты в цифровую эпоху.

В параграфе «Внедрение цифровых технологий и современных методов в образовательный процесс» Концепции развития системы высшего образования Республики Узбекистан до 2030 года в целях внедрения в образовательный процесс цифровых технологий и современных методов предложены следующие мероприятия: организация системы подготовки высококвалифицированных инженерно-технических кадров для цифровой экономики; создание дополнительных условий для обеспечения прочной интеграции современных информационно-коммуникационных и образовательных технологий, непрерывного развития профессионального мастерства педагогических кадров; индивидуализация образовательных процессов на основе цифровых технологий, развитие дистанционных образовательных услуг, широкое внедрение в практику технологий вебинара, онлайн, «blended learning», «flipped classroom»; организация дистанционных образовательных программ на основе современных информационно-коммуникационных технологий; внедрение в практику платформы «E-MINBAR» с возможностью онлайн-наблюдения и освоения лекций, практических занятий и семинаров, а также их загрузки на электронные средства хранения информации, использование «облачных технологий» в образовательных процессах; широкое внедрение системы электронных библиотек с возможностью дистанционного пользования ими, расширение возможностей непрерывного повышения профессиональной квалификации студентов путем организации пользования ими библиотечным фондом и базами данных после завершения обучения в высших образовательных учреждениях; ускорение создания национальных электронных образовательных ресурсов, организация работ по переводу зарубежных электронных образовательных ресурсов, поэтапное увеличение удельного веса электронных ресурсов в образовательном процессе, создание электронной учебной литературы, а также системы размещения в библиотеках информации по электронным ресурсам с помощью QR-кода с целью загрузки электронной учебной литературы на мобильные устройства; создание электронной базы научно-технической информации, состоящей из материалов конференций, выпускных квалификационных работ, магистерских и докторских диссертаций высшего образовательного

учреждения, широкое внедрение пользования системой антиплагиата с целью сохранения новизны научно-технической информации в будущем и т.д.[1].

Обозначенный путь дальнейшего развития нашего государства – это трансформация всей социально-экономической жизни в цифровую формацию (Цифровой Узбекистан - 2030), и в частности, библиотечно-информационной деятельности [2]. Информационно-библиотечная профессия сегодня реализуется на стыке информации, культуры и образования, а значит, какие выпускники придут сегодня в информационно-библиотечные учреждения, таков и будет импульс дальнейшего развития всей информационно-библиотечной отрасли, в целом [4]. Проведённый нами анализ подготовки будущих информационно-библиотечных специалистов в высших образовательных учреждениях республики показал, что сложившаяся система не имеет разработанной перспективной модели подготовки библиотечных специалистов новой формации на основе разработанной компетентности. Формирование системы компетенций информационно-библиотечного специалиста, на наш взгляд, откроет новые возможности в процессах внедрения и применения инновационной технологии в условиях перехода на цифровизацию образования.

На сегодняшний день, имеется большая потребность в квалифицированных преподавателях, владеющих инновационными образовательными и информационными технологиями, соответствующих международным компетенциям и способных работать в режиме кредитной системы. А это, в свою очередь, скажется на качественной подготовке профессиональных кадров нового поколения в области библиотечно-информационной деятельности и поступательного развития социально-экономической отрасли Узбекистана.

Совершенствование содержания подготовки библиотечных специалистов: инновационные подходы и методы

Основной концепцией современного образования (Болонская Конвенция) является компетентностный подход [3]. Сторонники компетентностного подхода отмечают, что он позволяет акцентировать внимание не на формировании определённых знаний, а на умении применять эти знания для эффективной деятельности в определённой ситуации и постоянно обновлять их, исходя из требований практики. Одной из главных задач, стоящих перед высшей школой, становится подготовка конкурентоспособных специалистов с учетом требований времени [1].

«Компетентностный подход — это совокупность общих принципов определения целей образования, отбора содержания образования, организации образовательного процесса и оценки образовательных результатов. К числу таких принципов относятся следующие положения:

• Смысл образования заключается в развитии у обучаемых способности самостоятельно решать проблемы в различных сферах и видах деятельности на основе использования социального опыта, элементом которого является и собственный опыт учащихся.

•Содержание образования представляет собой дидактически адаптированный социальный опыт решения познавательных, мировоззренческих, нравственных, политических и иных проблем.

• Смысл организации образовательного процесса заключается в создании условий для формирования у обучаемых опыта самостоятельного решения познавательных, коммуникативных, организационных, нравственных и иных проблем, составляющих содержание образования.

• Оценка образовательных результатов основывается на анализе уровней образованности, достигнутых учащимися на определённом этапе обучения» (Лебедев О.)

Поиск оптимальных и эффективных методов совершенствования подготовки информационно-библиотечных кадров в работах зарубежных исследователей показывает многогранность проблемы, а также многовариантность её решения. Так диссертация американского учёного (Ruzzi, B. L., 2019), представляющая собой смешанные методы case study, тематическое исследование, рассматривала вопрос о создании, внедрении новой модели и учебной программы в области научно-информационных исследований (Science in the school library inquiry model (SSLIM)). Анализ включал этапы сотрудничества в рамках процесса изменения в убеждениях библиотекаря в вопросах эффективности преподавания науки, а также изменения в представлениях студентов о том, кто может заниматься наукой, и представления студентов о природе науки и научных исследований [5].

Профессиональное развитие, основанное на технологиях, должно включать теоретические рамки, непосредственно учитывающие роль технологии, с тем чтобы в полной мере поддерживать технологическую интеграцию самих преподавателей. Кроме того, для повышения квалификации на основе технологий требуются новые модели для противодействия акценту на приобретении навыков. Исследователь (Gettman, S. L., 2019) использовал структуру TPACK (технологические, педагогические и контентные знания) — концептуализация обучения как смешение технологии, педагогики и содержания — для поддержки участников в оценке их собственной практической деятельности. Для измерения изменений в технологической интеграции исследователь использовал Рубрику оценки технологической интеграции (TIAR), основанную на структуре TPACK. Сравнение оценок TIAR до и после тестирования показало, что профессиональное развитие на основе TPACKK повысило оценку TIAR на

0,37 (*SE* = 0,051, *p* <0,001). Анализ средних оценок TIAR после тестирования для дополнительных опор показал, что наставничество (*M* = 2,47), моделирование (*M* = 2,29), а моделирование и наставничество (*M* = 2,27) набрали больше контрольной группы (*M* = 2,17), но не были статистически значимыми [6].

Виртуальные миры — это инновационные методы обучения, которые могут обеспечить захватывающий и увлекательный опыт обучения (Lu, 2010). Хотя они имеют потенциальные преимущества, студенты иногда испытывают дискомфорт с технологиями (Warburton, 2009). В этом исследовании изучалось, как студенты двух классов Американистики, использующие Second Life, оценивали свои собственные уровни самоэффективности виртуального мира на ранних и поздних этапах его использования, выявленные факторы повлияли на их самоэффективность, их отношение и восприятие ценности обучения, а также то, как студенты с различными степенями изменения в самоэффективности рассматривали свою ценность обучения. Качественные данные получены главным образом из интервью с небольшой группой студентов о развитии их навыков виртуального мира и их восприятии ценности обучения. Хотя самоэффективность, как правило, повысилась в обследовании, опрошенные сталкивались с внутренними и внешними барьерами, стимулирующими факторами, способствующими развитию самоэффективности (Stanton, L. M., 2017) [7].

Исследование смешанных методов промониторила практическую деятельность оценивания результатов обучения в магистерских программах, аккредитованных Американской библиотечной ассоциацией (ALA), в области библиотечных и информационных исследований (Shih, W., 2015). Анализируя содержание 12 презентаций программ магистратуры (MLIS), были выявлены 6 основных тем, которые свидетельствуют о том, что программы MLIS могут поддерживать процесс оценивания путем сочетания прямых и косвенных мер самого процесса, предоставления необходимой поддержки преподавателям и дальнейшей интеграции оценки в инфраструктуру и культуру программы (MLIS) [8].

Проблема исследования (Yates, S.S., 2014) заключается в том, что практикующие в классе не имеют навыков, необходимых для эффективного улучшения образования. Ограниченные исследования проводятся в отношении деятельности по повышению квалификации и восприятия преподавателями опыта профессионального обучения. Восприятие преподавателями своего профессионального опыта влияет на обучение в классе учащихся. Программа интеллектуальная система целей SMART Goal Framework (SGF) была разработана в качестве модели совершенствования системы образования, призванной обеспечить учителей навыками,

необходимыми для укрепления лидерского потенциала посредством целенаправленности, осмысления и сотрудничества. В этом качественном исследовании на одном месте изучалось восприятие учителей совместно с SGF, чтобы понять, как полученные навыки повлияли на поведение учителя и обучение учащихся, укрепили коллегиальность со сверстниками и школьными руководителями, и укрепили лидерский потенциал в школе. Индивидуальные интервью, письменные ответы и интервью в фокус-группе были проведены с 10 учителями, которые прошли подготовку и внедрили SGF в течение пяти лет в сельской школе Восточного Техаса. На основе анализа тематических исследований были триангулированы данные, в результате чего были выявлены три темы, связанные с навыками, приобретенными в ходе обучения по линии SGF: преднамеренное обучение, коллегиальность и сотрудничество, а также лидерство, как ключ к успешному внедрению SGF [9].

Будущее библиотек и изменения парадигмы библиотечно-информационного образования

Стремительное развитие технологий (интернета, облачных, цифровых и мобильных технологий, социальных сетей), а также изменения, происходящие в образовании, влияют на ожидания пользователей и вынуждают библиотеки разрабатывать новые ресурсы, услуги и внедрять инновационные сервисы обслуживания.

В 2011 г. B. T. Sullivan в своём исследовании сделал заявление о том, что вследствие эволюции поисковых систем и появления инновационных информационных носителей «академическая библиотека умерла» [10]. Автор акцентировал внимание на библиотеках колледжей и университетов, назвав следующие причины «смерти»:

1.«Физические коллекции книг устарели». По мнению автора, оцифрованные коллекции изданий сделали ненужными физические коллекции книг. Отдельные студенты теперь платят за подписку, обращаясь к любому из крупных поставщиков цифровых книг для получения неограниченного доступа к информации. Книги можно просматривать в интернете в любое время или загружать на портативное устройство.

2.«Библиотечная инструкция больше не нужна». Чтобы конкурировать с новым поколением поисковых систем, поставщики баз данных вынуждены создавать инструменты, которые были бы более удобными для пользователя.

3.«Информационная грамотность была полностью интегрирована в учебную программу». Программы по обучению информационной грамотности стали частью общей учебной программы колледжей.

4.«Библиотеки и библиотекари были заменены информационно-технологическими отделами». Библиотечные здания были преобразованы в

компьютерные лаборатории, учебные помещения и информационные отделы. Развитие коллекции стало простым вопросом поддержки подписки на базы данных, рекомендованной преподавателями.

5.«Справочные службы исчезли». Были заменены постоянно совершенствующимися поисковыми системами и инструментами социальных сетей.

6. «Экономика превзошла качество». Традиционная модель библиотек и функционал библиотекарей дает результаты, которые теоретически превосходят результаты новой модели: личный сервис, профессиональная помощь в исследованиях, доступ к высококачественным источникам информации. Но, в полной мере, этим пользуются так мало студентов, что услуги больше не оправданы экономически.

В противовес этому утверждению есть позиции других авторов, которые более оптимистично смотрят на будущее библиотек. Так, T. J. Wiebe (2016), Varnum K. J. (2017) при оценке роли академических библиотек в системе высшего образования и прогнозируя будущее библиотек считают, что библиотечные ресурсы (например, журналы, монографии, книги, инструменты/базы данных по дисциплинарным исследованиям) и услуги (например, межбиблиотечный абонемент, обучение информационной грамотности, библиотечные технологии) все еще имеют решающее значение для поддержания высокоэффективных исследовательских сред [11, 12].

Современные информационные технологии в трансформации информационно-библиотечного образования и подготовке библиотечных кадров

Сегодня сложно прогнозировать, какие технологии, возникающие в потребительском ландшафте, будут иметь непосредственное отношение к к подготовке квалифицированных информационно-библиотечных специалистов конкурентоспособных на современном рынке труда. Исходя из этих исследований, можно выявить следующие тенденции в области высшего образования, информационно-коммуникационных технологий (ИКТ), информацией, раскрывающей поведение пользователей и социальных сетей.

Большие данные. Исследовательские данные (Big Data). В академической среде исследователи хранят массивные коллекции данных вне библиотеки. С данным термином связывают выражение *«Volume, Velocity, Variety»* - принципы, на которых строится работа с большими данными. Это объем информации, быстродействие ее обработки и разнообразие сведений, хранящихся в массиве. В последнее время к трем базовым принципам стали добавлять еще один - *Value*, что обозначает ценность информации в теоретическом или практическом плане, что оправдывало бы затраты на ее хранение и обработку. Большие хранилища цифровых данных не составляли

бы значительного интереса, если бы не существовало технологий управления данными, что позволяют организациям анализировать и использовать структурированные, частично структурированные и неструктурированные данные в своих бизнес-процессах. Методы аналитики текстов, аудио, видео, социальных медиа и прогнозирования позволяют извлекать информацию из различных электронных данных и конвертировать ее в соответствующую форму с последующим возможным использованием в процессе принятия решений. Так, например, анализ текстов финансовых новостей может быть использован для прогнозирования рынка. Сейчас существует четыре основные области, где использование Больших данных обещает существенные положительные социальные перемены: адвокация, анализ и прогнозирование, удобный обмен информацией, содействие подотчетности и прозрачности [13]. Понятно, что получение полезной информации из наборов Big Data возможно при условии их доступности.

В последнее время в академических библиотеках активно развивается новое направление деятельности, которое называют Data Curation – хранение и повторное использование научных данных [14]. В некоторых библиотеках появляются соответствующие специалисты, в частности, Research Data Librarian, чьи должностные обязанности предусматривают помощь ученым учреждения, которые стремятся использовать доступные научные данные. Они занимаются анализом информационных потребностей исследователей, подготовкой учебных материалов по ресурсам, форматам метаданных и другими вопросами, связанными с использованием Больших данных.

Технологии связанных данных (Linked Data, LD, связанные данные) все больше привлекают внимание библиотеки несмотря на то, что диапазон связи выходит далеко за рамки возможностей отдельных данных, имеющихся в библиотеке. Эта технология позволяет машинам интерпретировать текст, помещать его в контекст и связывать его с соответствующими ресурсами, что делает возможным работу с данными из разных источников (в том числе возможность строить запросы).

Социальные медиа и библиотеки. Интерес к технологиям социальных сетей среди библиотекарей продолжает возрастать по мере появления все новых инструментов и увеличения числа пользователей сетей.

«Интернет вещей» (IoT) - передовая технология, добавляющая обычным устройствам сетевые возможности.

Виртуальная реальность — это мощный инструмент, позволяющий пользователю почувствовать цифровое пространство в объемной, трехмерной форме, осуществить навигацию по виртуальному пространству с помощью шлемов, очков, дисплеев, перчаток и других средств.

Другое направление компьютерной реальности - дополненная реальность, то есть предоставление дополнительной информации для восприятия реального мира (к примеру, текстовая информация, проиндексированная географическим местоположением).

Технические новинки в библиотеках. Как для решения внутренних технологических задач, так и для создания сервис-ориентированных технологий обслуживания, генерации собственных информационных продуктов и услуг, обеспечения доступа к приобретаемым лицензионным ресурсам библиотеки применяют различные технические и программные средства.

«Электронный библиотекарь», который позволяет читать книги в библиотеке, находясь вне ее - в офисе или дома. Для передвижения между книжными полками и объезда препятствий робот использует лазерную систему. Машина способна выбрать книгу и перелистывать страницы, передавая содержание на дисплей пользователя [15]. Библиотека - наиболее подходящее место для внедрения робототехники, так как здесь служебные роботы находятся под контролем библиотекарей.

Машинное обучение (Machine Learning) - процесс, в ходе которого компьютеры можно настраивать таким образом, чтобы они обучались сами.

Многие формы экономики совместного участия уже сейчас успешно используется в мире в различных сферах общественной жизни, в том числе в области информационных продуктов и услуг, что привело к появлению таких новых форм, моделей и терминов, как:

●Открытые знания (Open Knowledge), Открытые инновации (Open Innovation) – глобальные общественные движения, пропагандирующие совместное использование и распространение результатов научных исследований, идей, инноваций без юридических, общественных или технологических ограничений ради общего мирового прогресса и развития;

●Кодизайн (Co-design) – развитие продукта или услуги, в котором пользователь активно участвует в процессе и таким образом существенно влияет на конечный результат, благодаря чему созданные продукты, услуги более соответствуют ожиданиям конечных потребителей;

●Коворкинг (Coworking) – модель организации рабочего пространства, где специалисты разных организаций и даже отраслей работают вместе над отдельными проектами. Преимуществами такой деятельности является уникальная рабочая атмосфера, способствующая продуктивному обмену идеями между специалистами различных отраслей [16];

●Краудсорсинг (Crowdsourcing) – процесс, в рамках которого организация передает часть задач независимой группе лиц без заключения трудового договора и выплаты заработной платы [17];

●Краудфандинг (Crowdfunding) – финансирование сообществом различных проектов с помощью большого количества небольших одноразовых платежей, вносимых лицами, заинтересованными в реализации проекта [17];

●Холакратия (Holacracy) – система организации труда, где отсутствует разделение на менеджеров и работников. Все руководствуются общей целью, и каждый сотрудник может оказывать влияние на жизнь организации. При этом все остальные члены коллектива имеют право знать, чем коллега занимается и насколько эффективно выполняет свою работу. Уже сегодня библиотекари пытаются экспериментировать с приведенными выше формами и моделями, которые, вероятно, станут надежной социальной базой для внедрения технологий Библиотеки 4.0. Особенно успешным, динамично развивающимся направлением стала активная пропаганда и поддержка библиотекарями движения Открытого доступа, которое предполагает беспрепятственный легальный доступ ко всем типам научных документов, в частности, к исходным данным исследований, изображениям, видео, программному коду и т.п.

Заключение и выводы

В данной статье была сделана попытка исследовать наиболее приемлемые инновационные подходы и методы, и их дальнейшее применение в обучении информационно-библиотечных специалистов в бакалавриате. Сегодня в современных библиотеках создаются новые открытые пространства для коворкинга или хакспейса с целью привлечения студентов, преподавателей и предпринимателей к сотрудничеству. Эффективная работа библиотек, процесс обновления библиотечных фондов, материально-технической базы все больше зависит от эффективности поиска дополнительных источников финансирования, в том числе использование краудфандинга и краудсорсинга [17]. Как правило, распространение информации о подобных проектах библиотек происходит на специально созданных онлайн-платформах, а также на страницах популярных социальных сетей или блогов. В будущем, такие формы работы могут занять важное место в деятельности библиотек и потребовать квалифицированных специалистов.

Концепция Библиотеки 4.0 (Library 4.0). Эволюция Библиотеки 4.0 связана с развитием веб-технологий (Веб 2.0, 3.0, 4.0), изменением предпочтений пользователей и потребностей читателей, так как библиотека, которая может настроить себя на локальные потребности своего сообщества, — это библиотека, которая, скорее всего, будет считаться успешной и актуальной [12, 15]. Сейчас базовую основу концепции Библиотеки 4.0 составляют высокие технологии, с которыми пользователи могут эффективно

взаимодействовать в повседневной профессиональной и личной деятельности. В то же время, вряд ли потеряет актуальность физическое пространство библиотеки, где посетителям будет комфортно взаимодействовать друг с другом. В частности, сейчас живой интерес, как у сторонников инновационных технологий, так и у скептиков, вызывают специально оборудованные творческие лаборатории в общественных, учебных заведениях, в частных учреждениях, которые называют мейкерспейсами (MakerSpace) (встречаются и другие названия – FabLab, HackerSpace, TechShop). Традиционный мейкерспейс – это пространство, где пользователи могут совместно использовать ресурсы для проведения исследований, для работы над проектами, для обучения, преобразования идей в продукты, генерирования новых знаний и т.п. [18, 19].

Профессиональные компетенции библиотекарей будут очень важны для реализации вышеназванных функций; обучение библиотекаря 4.0 должно быть главным образовательным приоритетом уже сегодня, в противном случае библиотечному сообществу придётся всё время быть в роли догоняющего.

Многое в решении непростых вопросов по совершенствованию информационно-библиотечного образования зависит от желания самих преподавателей меняться, т.е. получать новые знания, умения и навыки и быть готовыми их транслировать будущим библиотечным специалистам. И этот процесс должен быть систематическим, поступательным и продолжающимся в течении всей жизни (lifelong learning) [21].

Подключение преподавателей к конкретному формулированию общих и специальных компетенций, должно привести к созданию ими курсов, обеспечивающих эти компетенции на выходе и объективному распределению зачётных единиц между дисциплинами образовательной программы, что безусловно будет непростой задачей при переходе от планирования учебной нагрузки на основе трудоёмкости к планированию на основе зачётных единиц кредитной системы. Эти изменения в формировании новой парадигмы обучения, на наш взгляд, помогут приблизить учебный процесс к решению реальных производственных задач и увеличить конкурентоспособность выпускников библиотечных высших образовательных учреждений на современном рынке труда.

Эффективность в преподавании библиотечно-информационных дисциплин намного зависит от компетентности профессорско-преподавательского состава, чёткого понимания актуальности преподаваемого предмета, знания своих профессиональных компетенций и студентов.

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FORMATION OF PROFESSIONAL COMPETENCE OF STUDENTS IN THE PROCESS OF TEACHING PEDAGOGICAL DISCIPLINES.

Kh. Umarov

Annotation: The article is devoted to the problem of formation of professional competence. Foreign and domestic experience is analyzed as a methodological basis and summarizing the conclusion about the concept of "competence". Information is provided on the history, stages of formation of "education based on competencies", types, groups of competencies, as well as methods that can contribute to the development of competencies of future personnel.

Key words: competence, competencies, professional competence, staff training, teaching staff training.

ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ В ПРОЦЕССЕ ПРЕПОДАВАНИЯ ПЕДАГОГИЧЕСКИХ ДИСЦИПЛИН

Умаров Х. А.

Аннотация: Статья посвящена проблеме формирования профессиональной компетентности. Зарубежный и отечественный опыт анализируется как методологическая основа и обобщающий вывод о понятии «компетентность». Приводится информация об истории, этапах становления «образования на основе компетенций», видах, группах компетенций, а также методах, которые могут способствовать развитию компетенций будущих кадров.

Ключевые слова: компетентность, компетенции, профессиональная компетентность, подготовка кадров, подготовка педагогических кадров.

Introduction

In the Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis, as the wise men of the East said, "The greatest wealth is intelligence and knowledge, the greatest heritage is a good upbringing, the greatest poverty is ignorance!" Therefore, the acquisition of modern knowledge,

true enlightenment and high culture should become a vital need for all of us. Therefore, the active transition to the digital economy will be one of our priorities for the next 5 years". The present and future of our country are in the hands of our highly spiritual and enlightened youth. The reform of the system of continuing education in the Republic of Uzbekistan is aimed at the formation of a new generation of specialists in the future, the laws of high professional culture, creative and social activity, independent participation in socio-political life [11, p.6]

Despite the fact that the term "competence" has been actively used in our lexicon for several decades and a lot of research has been carried out in this area, it still does not have a generally accepted definition. In a swarm, the opinion of specialists is the opposite when it comes to explaining the concepts of "competence" and "competency-based approach". While some consider competence to be the "modern name" for knowledge, skills and abilities, others argue that it is much broader than these concepts and consider it to be a person's ability to act in non-standard situations.

In the Great Modern Encyclopedia compiled by Evgeny Stepanovich Rapatsevich [6, p.376] "competence" is defined as a measure of the correspondence of knowledge, skills and experience of persons of a certain socio-professional status to the real level of complexity of the tasks they perform and the problems they solve. Unlike the term "qualification", it includes, in addition to purely professional knowledge and skills that characterize qualifications, such qualities as initiative, cooperation, the ability to work in a group, communication skills, the ability to learn, think logically, select and use information.

For the first time, the term competence was used in the report of the UNESCO International Commission on Education for the 21st Century by its leader J. Delors (1996): learning to know, learning to do, learning to live together and learning to live. They were then fleshed out at a symposium in Bern (1996) as five "core" competencies that young Europeans should acquire:

- political and social competencies;
- competencies related to life in a multicultural society;
-competencies related to the possession of oral and written communication;
- competencies associated with the growth of informatization of society;
- the ability to learn throughout life in the context of both professional and social life.

The problems of the competency-based approach are intensively studied by foreign (I.A.Zimnyaya, N.V.Kuzmina, G.Halasz, A.K.Markova, etc.) and local (N.A.Muslimov, Sh.S.Sharipov, B.S.Abdullaeva, O.A.Kuisinov, M.M.Kadirov, Kh.A.Umarov, etc.) researchers.

I.A. Zimnyaya [1, p.36] based on the analysis of foreign and domestic publications on the issue of competence, she identified three stages in the formation of "education based on competencies".

The first stage is characterized by the introduction of the category "competence" into the scientific thesaurus, the creation of prerequisites for distinguishing between the concepts of "competence", the study of types of linguistic competence in the context of N. Chomsky's transformational grammar, and the introduction of the concept of "communicative competence".

The second stage is determined by the use of a competency-based approach in the theory and practice of language teaching, in management and psychology of communication, the concepts of "social competencies / competencies" are introduced; J. Raven defined competence as a motivational ability and proposed 37 types of competences. At this stage, competence becomes the subject of interdisciplinary research.

N.V. Kuzmina considers competence as an integrative property of a person, and L.A. Petrovskaya studies communicative competence.

The third stage is different in that the competence-based approach takes on a pan-European format, occupies a leading position in UNESCO materials and is considered as the desired result of education.

G.Halasz believes that the competency-based paradigm is a response to the "challenges" facing Europe: the preservation of a democratic open society, multilingualism and multiculture, new labor market requirements, the development of complex organizations.

In psychological and pedagogical science, this period is characterized by the publication of research results in the field of professional competence (A.K. Markova), pedagogical competence (L.M. Mitina) and social competences (I.A. Zimnyaya).

The specificity of the third stage lies in the fact that the concept of competence has moved from the field of theoretical research into the direct practice of education and has acquired a regulatory and legal status.

Thus, five key competencies, which are given special importance in the professional education of the countries of the European Community - social, communicative, socio-informational, cognitive and special competencies - have the status of a European standard.

Methods

There are different approaches to the classification of competencies and competencies. I.A. Zimnyaya identified ten competencies, which she divided into three groups: [1, p.38]

First group. Competences related to the person himself as a person, the subject of activity and communication:

Competencies of health-saving: knowledge and observance of the norms of a healthy lifestyle, knowledge of the dangers of smoking, alcoholism, drug addiction, AIDS; knowledge and observance of the rules of personal hygiene, everyday life; physical culture of a person, freedom and responsibility of choosing a lifestyle.

Competencies of value-semantic orientation in the world: values of being, life; cultural values (painting, literature, art, music); science; production; history of civilizations, own country; religion.

Integration competencies: knowledge structuring, situationally adequate updating of knowledge, expansion and increment of accumulated knowledge.

Competences of citizenship: knowledge and observance of the rights and obligations of a citizen; freedom and responsibility, self-confidence, self-worth, civic duty; knowledge and pride in the symbols of the state (coat of arms, flag, anthem).

Competencies of self-improvement, self-regulation, self-development, personal and subject reflection; meaning of life; Professional Development; language and speech development; mastery of the culture of the native language, knowledge of a foreign language.

Second group. Competences related to the social interaction of a person and the social sphere:

Competencies of social interaction: with society, team, family, friends, partners; conflicts and their settlement, cooperation, tolerance, respect and acceptance of the other (race, nationality, religion, status, role, gender), social mobility.

Competencies in communication: oral, written, dialogue, monologue, generation and perception of text; knowledge and observance of traditions, ritual, etiquette; business correspondence; office work, business language, foreign language communication, communicative tasks, levels of impact on the recipient.

Third group. Competences related to human activities:

Competencies of cognitive activity: setting and solving cognitive tasks; non-standard solutions, problem situations - their creation and resolution; productive and reproductive cognition, research, intellectual activity.

Activity competencies: play, study, work; means and methods of activity: planning, design, modeling, forecasting, research activities, orientation in various types of activity.

Information technology competencies: receiving, processing, issuing information; transformation of information (reading, note-taking), multimedia technologies, computer literacy; possession of e-mail, Internet technology.

I.A. Zimnyaya [1, p.40] argues that if the named competencies are considered as actual competencies, then they will include the following characteristics:

a) Readiness to demonstrate competence (motivational aspect);

b) Possession of knowledge of the content of competence (cognitive aspect);

c) Experience in the manifestation of competence in standard and non-standard situations (behavioral aspect);

d) Attitude to the content of competence and the object of its application (value-semantic aspect);

e) Emotional-volitional regulation of the process and result of the manifestation of competence.

V.I. Baidenko distinguishes the following competencies: professional (professionally oriented), general (key, basic, universal, transdisciplinary, metaprofessional, supraprofessional), academic, social and personal.

Professional competencies are the readiness and ability to act expediently in accordance with the requirements of the profession, to solve problems and problems in a methodical and organized manner, and to evaluate the results of one's activities.

General competencies are an ability based on knowledge, experience, values, inclinations that are acquired in all types of educational practice: formal, informal and informal.

Academic competencies are abilities that ensure the assimilation of knowledge and skills, the originality and independence of the implementation of educational programs for the bachelor's and master's degrees.

Social competencies are the willingness and ability to form and live in social interaction and reach agreement with others.

Personal competencies are the readiness and ability of a person to identify, comprehend and evaluate the prospects for their development, to realize themselves in professional, social and family life, to show their own talents and develop their life plans. The presence of personal competencies implies the formation of such qualities as independence, self-respect, reliability, conscious responsibility, a sense of duty, an orientation towards socially significant values.

Each type of competencies and competencies requires the specification of their structural components and a certain adaptation to the goals and objectives of a particular professional area, professional training and professional activity.

A.K.Markova offers a four-component structure of the teacher's professional competence:

- professional (objectively necessary) psychological and pedagogical knowledge;
- professional (objectively necessary) pedagogical skills;
- professional psychological positions, attitudes of the teacher, due to his profession;
- personal characteristics that ensure the teacher's mastery of professional knowledge and skills.

In her monograph "Psychology of professionalism" she classifies the types of professional competence: special, social, personal and individual.

L.M. Mitina distinguishes two substructures of pedagogical competence: activity and communicative.

The most differentiated classification of competencies and competencies is presented in the works of I.A. Zimney. It proceeds from the assumption that competencies are internal, potential, latent psychological neoplasms that manifest themselves in competence.

Results

Competence as a personal characteristic is not limited to the level of mastery of certain knowledge and skills by a person. Competence is an ability based on values, personal orientation, knowledge, experience acquired by a person in the learning process. It is expressed in the mobilization by the individual of the acquired knowledge and experience in a particular situation. Being a professionally competent person means the ability to mobilize oneself, one's own knowledge, skills and behavioral attitudes in the conditions of a specific activity and a developing situation. Therefore, the most important components of a person's professional competence are professional mobility, the ability to express themselves and create themselves, technological literacy, and a high degree of adaptation to changing working conditions. [8, p.25]

The concept of "competence" today includes not only compliance with the position held, the ability to solve professional problems, but also openness to new experience, the ability to make responsible decisions and find a way out of emergency situations, the need and ability for personal development and professional growth throughout life. The modern interpretation of the concept of "competence" includes the mastery of values by a person, the formation of her internal motivation, psychological and practical readiness to achieve better results in her professional activity; attitude to one's own profession and self-education as values. At the same time, the content aspect of the term "competence" includes three components: cognitive (knowledge), operational (methods of activity, psychological and practical readiness to solve problems with a high degree of uncertainty), axiological (mastering values, value attitude to professional work and personality). nomu growth). Such a point of view on the essence of competence,

according to O.L. Zhuk [5, p.127] prevails in the works of foreign and domestic researchers

A.V. Khutorskoy [7, p.57] identified the following key competencies:
- Value-semantic competence;
- General cultural competence;
- Educational and cognitive competence;
- Information competence;
- Communicative competence;
- Social competence;
- Competence of personal improvement.

The process of training and education, designed on the basis of the competencies listed above, is not a disparate subject, but a holistic competence-based education.

The most important task of professional education at any level is to design the personality of a future specialist in the unity of personally significant and professional qualities: professional independence, professional mobility, collectivism, professionalism. Pedagogical design of the personality of the future teacher includes the following components:
- Professionally significant knowledge, abilities and skills that determine professional competence (qualification potential);
- Performance (psycho-physiological potential);
- Intellectual, cognitive abilities (educational potential);
- Creative abilities (creativity);
- Ability for cooperation, collective organization and interaction (communicative potential);
- Value-motivational sphere (ideological, spiritual, and moral potential).

All these components are in close unity. Their design is carried out in the form of a professiogram. A general pedagogical professiogram is an ideal model of a teacher's personality, abstractly summarizing the most essential personal and professional qualities necessary for the effective implementation of pedagogical activity in any pedagogical system.

N.N.Koshel [4, p.12] believes that the professional competence of a teacher can be represented as an integrated structure, including:

• special readiness, represented by a special qualification and functional literacy of a person, his personal competence as an integrated ability to identify and self-actualization in action, social functional literacy;

• qualification in activity, a reflective superstructure "over activity" (the result of mastering the technology of pedagogical activity in practice and acquiring the ability to reflect it, criteria-based analysis, in the processes of postgraduate education and practical activity);

• organizational and activity competence, the ability to transform activity on the basis of the results of its reflexive analysis (the result of mastering the mechanisms of activity development in the process of continuous professional education and practical activity).

Professional competence is a performance-based characteristic of education, and special readiness is the minimum level of competence that ensures the effectiveness and efficiency of performing the functions assigned to a specialist.

In the article by O.L. Zhuk "Competence-based approach in higher professional education", five groups of key competencies of a university graduate are identified [2, p.45]:

➢ social, providing the value-semantic orientation of the individual, the formation of civil, valeological and psychological-pedagogical literacy and culture, as well as psychosocial adaptation;

➢ professional, related to the mastery of design and reflective skills, the ability and willingness to solve professional problems of a high degree of uncertainty, to master and develop innovations in the field of the profession;

➢ communicative, including the culture of speech behavior, language literacy and the ability for productive communication and cooperation;

➢ information related to the search, storage, processing, presentation of information; computer literacy and information technology;

➢ educational, providing the ability and readiness for independent cognitive work, constant self-improvement, professional growth, research activities.

The author argues that the competencies listed above should be consistent with the characteristics that are reflected in the general requirements for the professional training of a graduate. One cannot but agree with the opinion of the author, because the professional training of students in our republic must comply with state standards of education.

Discussion

The rapid pace of development in the modern world poses requirements for pedagogy - to keep up with the trend. … In addition, society requires an emphasis on the personality of students and individualization of education. [9, p.1318]

In timely training of teaching staff, special attention is paid to compliance with the requirements in the preparation of graduates to state education standards. During their studies at the university, students study a large number of pedagogical disciplines, as well as special courses and special seminars on pedagogical topics, taking into account their specializations. The study of pedagogical disciplines is carried out using different didactic models: personality-oriented, technological, search, etc. In the context of the introduction of a credit-modular system of

education, special attention is paid to the search model of education, in which the developmental potential of education is realized.

In the process of studying pedagogical disciplines, interactive teaching methods are widely used, which can be considered as methods of enhanced purposeful activity of the teacher and students in organizing interaction between themselves and intersubject interaction of all participants in the pedagogical process to create optimal conditions for development.

Interactive interaction is a process of joint activity of teachers and students, the attributes of which are: spatial and temporal co-presence of participants, creating the possibility of personal contact between them; the presence of a common goal, an anticipated result of activity that meets the interests of all and contributes to the realization of the needs of everyone; planning, control, correction and coordination of actions; division of a single process of cooperation, common activity between participants; the emergence of interpersonal relationships. Interactive interaction is an intensive communicative activity of the participants in the pedagogical process, diversity and change of types and forms, methods of activity. The structure of interactive pedagogical interaction is the basis for the classification of active teaching methods. In accordance with the leading function of this or that method in the organization of pedagogical interaction, S.S. Kashlev [3, p.86] classified them into the following groups:

- methods of creating a favorable atmosphere, organizing communication;
- methods of exchange of activities;
- methods of mental activity;
- methods of meaning creation;
- methods of reflective activity;
- integrative methods (interactive games).

The use of interactive methods of teaching pedagogical disciplines provides an opportunity to introduce creative forms of work with students into the pedagogical process.

These include: educational and cognitive (didactic) games, problematic tasks and situations, pedagogical collages, drawing up educational crossword puzzles, pedagogical dramatizations, trainings, business games, classes in the form of a round table session, pedagogical olympiads, competitions and etc. This list of creative forms is concretized and expanded with respect to the specifics and content of specific subjects.

Creativity in the classroom is currently considered not as something unique, characteristic of individuals, but as an obligatory component of the professional activity of a teacher, called upon to teach students the individual application of knowledge in non-standard life situations. There is not and

cannot be "one pedagogical recipe" for all occasions, the same solution to different pedagogical problems. The knowledge acquired by students during classes is consolidated in the process of training and work practices, which give the student the opportunity to test himself for professional compliance.

A necessary condition for organizing education as an educational and creative activity aimed at developing creative abilities and non-standard thinking of students is the creation of a developing, cultural and educational environment in an educational institution. This presupposes the availability of an appropriate material base for the implementation of the educational process of students.

When students are motivated, participate actively and with enthusiasm in learning process, interested in subject and the whole process of learning, collaborate and interactive communicate with each other and with teacher, easy and convenient assimilate educational content then effectiveness of education will easily increase . [8, p.4]

It should be noted that the process of forming the professional competencies of university graduates continues after graduation. We must not forget that competence in any type of activity involves mastering the skill in the implementation of professional duties and solving tasks. Therefore, the main task of modern education is to prepare a person capable of self-improvement throughout his life and professional activity.

One of the most pressing issues for all educational institutions is a new direction in pedagogy as a practical solution to increase the information literacy of students, the development of their media and digital competencies -the growing interest in the experience of media education [10, p.49]

The teacher and the student are full participants in the dialogue, during which the knowledge of each of them is transformed, refined, the depth of understanding of the material is checked; Collaborative learning is a systemic strategy where students work in small groups on one common problem. Working in a group, students cannot remain passive observers, the contribution of each of the participants is significant. Teamwork is becoming an increasingly used organizational strategy in most areas of human endeavour. [12, p.4]

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РОЛЬ И ЗНАЧЕНИЕ ИННОВАЦИОННЫХ МЕТОДОВ В ВЫСШЕМ ОБРАЗОВАНИИ УЗБЕКИСТАНА

Мусаева Ж. К.

Аннотация: В статье рассмотрены особенности и преимущества модульной системы образования в высшей школе, значение принятых указов и законов Президентом Республики Узбекистан Ш.М. Мирзиёевым о развитии образования и науки, т.е. повышении качества и эффективности деятельности высших учебных заведений на основе внедрения международных стандартов оценки качества образования. В статье также

обобщается важность использования передовых и современных интерактивных методов обучения, акцентируя внимание на внедрении в процесс новых информационных технологий, использовании инновационных технологий в системе образования.

Ключевые слова: высшее образование, инновационная технология, метод, качество обучения, модульная технология, кредитный модуль, контроль, мотивация, самостоятельность, научно-методический опыт, рациональный, экономика, национальная модель.

ROLE AND SIGNIFICANCE OF INNOVATIVE METHODS IN HIGHER EDUCATION IN UZBEKISTAN

J. Musaeva

Annotation: The article deals with the features and advantages of the modular system of education in higher education. Significance of decrees and laws adopted by the President of the Republic of Uzbekistan Sh.M. Mirziyoyev on the development of education and science, i.e. improving the quality and efficiency of higher education institutions based on the introduction of international standards for assessing the quality of education. The article also summarizes the importance of using advanced and modern interactive teaching methods, focusing on the introduction of new information technologies into the process, the use of innovative technologies in the education system.

Keywords: higher education, innovative technology, method, quality of education, modular technology, credit module, control, motivation, independence, scientific and methodological experience, rational, economics, national model.

Введение

В условиях экономической стабилизации в Узбекистане ускоряются темпы социально-экономических реформ, происходят качественные изменения во всех жизненных сферах, а также в сфере образования за счет обновления, современных подходов и современных требований.

Одним из наиболее актуальных вопросов на сегодняшний день является углубление экономических реформ в нашей стране, работа по применению международных стандартов и лучших инновационных методов в сфере образования, в частности, в системе высшего образования. К ним относятся создание учебников нового поколения, использование в учебном процессе современных зарубежных учебников, использование передовых инновационных технологий в образовательном процессе на основе новых квалификационных требований высшей школы, создание всех условий для самостоятельного обучения.

Мощь любой страны определяется ее интеллектуальным потенциалом и напрямую связана с качеством образования. Принятие и реализация совершенно новой национальной модели подготовки кадров – Закона «Об образовании» и Национальной программы подготовки кадров, формирование творческой, социально активной, духовно богатой личности и подготовка высококвалифицированных, конкурентоспособных кадров создали методическую основу для достижения цели.

Важную роль играет новая стратегия развития образования и науки Узбекистана на 2022-2026 годы, принятая под руководством Президента нашей страны Ш.М. Мирзиёева, особенно в развитии повышении качества и эффективности деятельности высших учебных заведений на основе внедрения международных стандартов оценки качества образования и обучения. Наряду с этим, постепенное увеличение квоты приема имеет важное значение в повышении интеллекта и степени образования молодёжи

Программа направлена на увеличение охвата высшим образованием до 50% и повышение качества образования, наладить практику самоопределения, разработать целевую программу по подготовке 10 потенциальных вузов к вхождению в международные рейтинги QS и THE. К 2026 году, увеличить количество негосударственных высших учебных заведений не менее чем до 50, дать женщинам образование и профессиональные навыки, помочь им найти достойную работу, поддержать предпринимательство, выявить талантливых молодых женщин и направить их способности, обеспечить открытое и качественное образование для молодежи, обеспечить отличное образование для молодежи в целом. Создание условий для развития инклюзивного образования, создание факультетов в сотрудничестве с ведущими мировыми высшими учебными заведениями с целью подготовки квалифицированных кадров с современными знаниями и навыками в соответствии с требованиями промышленных предприятий. Необходимо отметить, что важную роль играет разработка и реализация программы «Двойное образование», которая дала результаты в развитых странах [15].

Разработка новых подходов к обучению и воспитанию студентов, обучение модульным технологиям обучения, совершенствование структуры и содержания существующих технологий обучения, а также непрерывное повышение квалификации педагогов, работающих в этой области, является требованием времени.

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[15] Указ Президента Республики Узбекистан о новой Стратегии развития Республики Узбекистан на 2022-2026 годы № УП-60 от 28.01.2022 г. https://lex.uz/docs/5841063

В связи с этим, в целях коренного повышения качества подготовки высококвалифицированных специалистов на основе постоянного повышения профессионализма и квалификации преподавателей высших учебных заведений, внедрение усовершенствованной системы регулярной переподготовки кадров в соответствии с современными требованиями, принято Постановление № ПФ-5789 от 27 августа 2019 года «О внедрении системы непрерывного повышения квалификации педагогических работников».[16.].

Одной из основных задач, на решении которой нам сегодня необходимо сосредоточиться, является дальнейшее повышение научного потенциала высших учебных заведений, расширение масштабов подготовки научных и научно-педагогических кадров [17]

В «Концепции развития системы высшего образования Республики Узбекистан до 2030 года», утвержденной Указом Президента Республики Узбекистан от 8 октября 2019 года № ПФ-5847, внедрение цифровых технологий и современных методов обучения в высшей школе поставлены конкретные задачи по увеличению доли студентов, обучающихся по инженерно-техническому образованию, внедрению кредитно-модульной системы, увеличению доли практических занятий по специальным предметам, направленным на совершенствование практических навыков в учебных планах.

Мы поставили перед собой великую цель заложить основы Третьего Возрождения (Ренессанса) в нашей стране, для чего мы должны создать среду и условия, которые воспитают новых Хоразмийцев, Беруни, Ибн Сино, Улугбеков, Навои и Бабуров. При этом, прежде всего, главными столпами нашей национальной идеи должны служить развитие образования и воспитания, принятие решений о здоровом образе жизни, развитие науки и инноваций [18].

Сегодня важно внедрять современные методы обучения на основе международных стандартов, в том числе модульную систему обучения. Термин «модульное обучение» представляет собой интернациональное

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[16] Указ Президента Республики Узбекистан от 27 августа 2019 года № ФП-5789 «О введении системы непрерывной подготовки руководителей и преподавателей высших учебных заведений».

[17] Постановление Президента Республики Узбекистан Концепция развития социально-экономического комплекса Республики Узбекистан до 2030 года ID-9413. окт.2019 г

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[18] Ўзбекистон Республикаси Президентининг 2019 йил 8 октябрдаги ПФ-5847-сон Фармони билан тасдиқланган «Ўзбекистон Республикаси Олий таълим тизимини 2030 йилгача ривожлантириш концепцияси»

понятие — модуль («модуль», лат. Modulus), значение которого — узел, состоящий из тесно связанных между собой элементов, способных функционировать, т. е. понимается как основной инструмент модульного обучения, как законченный информационный блок. Модуль – это логически завершенный учебный материал, который основан на разработанных принципах и ориентирован на овладение одним или несколькими понятиями науки или дисциплины.

Модульное обучение дает возможность комплексно решать следующие современные задачи профессионального образования, а именно:

- модуль – оптимизация и систематизация содержания обучения на основе деятельного подхода для обеспечения гибкости программ;
- индивидуализация обучения;
- контролировать эффективность обучения на практических занятиях;
- на основе профессиональной мотивации, активизации процесса обучения, самостоятельности и полной реализации возможностей обучения.

Необходимо отметить следующие преимущества модульной системы обучения:

- обеспечивается преемственность преподавания между дисциплинами, междисциплинарными модулями;
- методологически обоснованная совместимость всех видов учебного процесса внутри и между модулями;
- «гибкость модульной структуры учебной дисцилины или предмета»;
- регулярный и эффективный мониторинг обучения студентов;
- расслоение учащихся по способностям;

• в результате «выжимания» информации ускоряется процесс освоения знаний и обучение, эффективно используются аудиторные часы и оптимизируется содержание учебного времени, часов, отводимых на лекционные, практические занятия, индивидуальную и самостоятельную работу. В результате у студента точно будет достаточно знаний умений и навыков.

При подготовке модулей дисциплин и предметов в высших учебных заведениях важно использовать новые образовательные технологии, опыт ведущих вузов страны по их применению с учетом их методических рекомендаций. Также необходимо учитывать методы и средства разработки технологии лекций, практических и семинарских занятий, правила учебной технологии, предмет и основные задачи предмета, дисциплины, специфику преподавания предмета, дисциплины в высшей школе, а также

использование совместимости педагогического и научно-методического опыта преподавателей и авторов методики преподавания.

Необходимо углубление реформ в цифровой экономике, помимо новых инвестиций в экономику и модернизации существующей материально-технической базы, укрепление демократических принципов управления, расширение сферы самостоятельности предприятий, фирм и приравненных к ним производственных структур, инициативы во всех сферах человеческой деятельность, развитие исследований. Также важно предоставить знания о том, как создать широкий спектр возможностей.

К особенностям современного этапа развития общества относятся повышение образовательного и культурного уровня населения, особенно молодежи, оздоровление экономики предприятий и фирм в количественном и качественном отношении, обеспечение вхождения Республики Узбекистан в число развитых стран.

В новой Стратегии развития Узбекистана на 2022-2026 годы предусмотрена дальнейшая либерализация ведущих отраслей и экономики и завершение трансформационных процессов на основе увеличения промышленного производства в 1,4 раза, продолжение промышленной политики, направленной на обеспечение устойчивости национальной экономики и увеличение доли промышленности в ВВП, такие цели, как широкое внедрение инноваций в экономику, развитие кооперации промышленных предприятий и научных учреждений, создание 200 новых промышленных зон в регионах и развитие системы бизнес-инкубаторов[19].

Модернизация образовательного процесса в высших учебных заведениях, развитие профессиональной компетентности преподавателей в повышении качества системы подготовки педагогов, оснащение их современными профессиональными знаниями, навыками и умениями в данной области, самостоятельное использование научно-технических новшеств, творческие навыки и развитие решения проблем являются ключевыми задачами.

В высшей школе экономика направлена на формирование у студентов необходимых специфических экономических знаний, что очень важно сегодня в ситуации, когда центр экономических процессов поднялся до уровня экономики предприятия и государства.

Важно использовать передовые и современные интерактивные методы обучения, уделять внимание внедрению в этот процесс новых

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[19] Указ Президента Республики Узбекистан о новой Стратегии развития Республики Узбекистан на 2022-2026 годы № ПФ-60 от 28.01.2022 г. https://lex.uz/docs/5841063

информационных технологий, чтобы студенты овладевали экономическими науками на достаточном уровне в рамках программы.

Широкое использование наглядных пособий, раздаточных материалов, интерактивных и дистанционных методов при изучении, преподавании и изучении наук, а также при проведении тренингов, издаваемых Госкомстатом Республики Узбекистан, министерствами, отраслевыми научно-исследовательскими учреждениями, международными экономическими организациями и исследовательскими центрами, использование материалов из предоставленных статистических и аналитических сборников имеет важное значение.

Экономика является основой общества. Его состояние, достижения и перспективы являются предметом изучения различных экономических дисциплин (микроэкономика, макроэкономика, отраслевая экономика, региональная экономика, экономика предприятия, бухгалтерский учёт, экономический финансовый анализ и др.).

Известно, что экономика отражает состояние общества, использование производительных сил и уровень их развития, использование достижений научно-технического прогресса, уровень культуры и образованности народа. Помимо необходимых для общества материальных благ, состояние экономики предприятий оказывает непосредственное влияние на всю экономику, так как основная часть национального дохода производится на предприятиях. Чем лучше и эффективнее работают промышленные предприятия, независимо от их принадлежности и формы собственности, тем выше экономические показатели и уровень жизни населения.

Практика показывает, что успешное развитие экономики, особенно на национальном уровне, зависит от эффективности и прибыльности предприятий. Это связано с тем, что предприятия, помимо производства необходимой обществу продукции, объединяют и используют основную массу трудоспособного населения, финансовые и материальные ресурсы, производственные мощности.

Факторы производства продукции [20]

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[20]Economics. Jonh Sloman, Alison Wride. Seventh edition. 6 page

Definitions

Production The transformation of inputs into outputs by firms in order to earn profit (or to meet some other objective).

Consumption The act of using goods and services to satisfy wants. This will normally involve purchasing the goods and services.

Factors of production (or resources) The inputs into the production of goods and services: labour, land and raw materials, and capital.

Labour All forms of human input, both physical and mental, into current production.

Land and raw materials Inputs into production that are provided by nature: e.g. unimproved land and mineral deposits in the ground.

Capital All inputs into production that have themselves been produced: e.g. factories, machines and tools.

Экономика ближе к категории производственной, чем к категории научной, и функционирует и развивается за счет научно-технического прогресса, эффективного взаимодействия производственной и непроизводственной отраслей, рационального использования ресурсов и рационального управления.

Экономика предприятия — система знаний, связанных с процессом разработки и принятия хозяйственных решений в ходе деятельности предприятия.

Предприятие является самостоятельным экономическим хозяйственным субъектом, целью деятельности которого выступает удовлетворение общественных потребностей и получение прибыли. Предприятие является основным звеном рыночной экономики. Именно предприятие является основным производителем товаров и услуг, основным субъектом рынка, вступающим в различные хозяйственные отношения с другими субъектами. Поэтому экономика предприятия, как система знаний и методов управления хозяйственной деятельностью предприятия, занимает важное место в организации производства и распределения благ в условиях любой экономической системы.

Изучению экономики предприятия уделяется первостепенное внимание при подготовке как экономистов, так и будущих инженеров и специалистов-не экономистов

Чему учит экономика [21]

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[21] John Sloman, Alison Wride . Economics. Seventh edition. 2009, England . 5 page

1.1 WHAT DO ECONOMISTS STUDY?

Many people think that economics is about *money*. Well, to some extent this is true. Economics has a lot to do with money: with how much money people are paid; how much they spend; what it costs to buy various items; how much money firms earn; how much money there is in total in the economy. But as we will see later in the book, money is only important because of what it allows us to do; money is a tool and economics is more than just the study of money.

It is concerned with the following:

- The *production* of goods and services: how much the economy produces, both in total and of individual items; how much each firm or person produces; what techniques of production are used; how many people are employed.
- The *consumption* of goods and services: how much the population as a whole spends (and how much it saves); what the pattern of consumption is in the economy; how much people buy of particular items; what particular individuals choose to buy; how people's consumption is affected by prices, advertising, fashion and other factors.

But we still have not quite got to the bottom of what economics is about. What is the crucial ingredient that makes a problem an economic one? The answer is that there is one central problem faced by all individuals and all societies. From this one problem stem all the other economic problems we shall be looking at throughout this book.

This central economic problem is the problem of scarcity. This applies not only in countries like Ethiopia and the Sudan, but also in the UK, the USA, Japan, France and all other countries of the world. For an economist, scarcity has a very specific definition.

The problem of scarcity

Ask people if they would like more money, and the vast majority would answer 'Yes'. They want more money so that they can buy more goods and services; and this applies not only to poor people but also to most wealthy people too. The point is that human wants are virtually unlimited.

Yet the means of fulfilling human wants are limited. At any one time the world can only produce a limited amount of goods and services. This is because the world only has a limited amount of *resources*. These resources, or *factors of production* as they are often called, are of three broad types:

- Human resources: *labour*. The labour force is limited in number, but also in skills. This limits the productivity of labour.
- Natural resources: *land and raw materials*. The world's land area is limited, as are its raw materials.
- Manufactured resources: *capital*. Capital consists of all those inputs that have each had to be produced in the first place. The world has a limited stock of capital: a limited supply of factories, machines, transportation and other equipment. The productivity of capital is limited by the state of technology.

So here is the reason for scarcity: human wants are virtually unlimited, whereas the resources available to satisfy these wants are limited. We can thus define scarcity as follows:

В процессе использования модульной технологии обучения при освещении предмета дисциплин по экономике исследование делает некоторые *выводы*:

• оптимальное использование современных педагогических технологий в освещении тем естественных наук и дальнейшее повышение эффективности уроков;

• использование новейшей современной зарубежной литературы, интернет-ресурсов для дополнения содержания научных тем;

• научить студентов решать экономические задачи из компьютерных программ в аудиторных и самостоятельных занятиях (MSExcel, GAMS, SPSS и др.)

• модульное обучение обеспечивает достижение достаточных условий для оптимизации содержания обучения и гибкости программ систематизации и самостоятельного изучения учебного материала;

• ориентация на индивидуализацию обучения на основе знаний, навыков и умений в работе со студентами;

• применение кейсов, вызывающих ситуационные задачи на практических занятиях и развитие практических навыков у студентов;

• достижение эффективного овладения наукой за счет ускорения обучения, контроля за эффективностью обучения.

Рекомендации:

Для дальнейшего совершенствования реализации модульного подхода к обучению в высшей школе целесообразно дать следующие рекомендации:

• Разработка новых учебных планов, программ и подготовка современной литературы в соответствии с национальной моделью кредитно-модульного обучения в бакалавриате и магистратуре вузов страны на основе зарубежного опыта;

• Обеспечение опережающего развития «научно-образовательной-производственной» интеграции, деятельности в сотрудничестве и достижение непосредственного участия в образовании, в практике на производстве, а также сфере обслуживания обучающихся;

• Поддержка стажировки студентов в развитых странах, приближение времени прохождения практики в учебном плане к зарубежным странам, а также признание стажировок за рубежом;

• Для использования при переподготовке и повышении квалификации преподавателей, специалистов, мастеров организации интенсивных курсов по педагогическим, информационным и коммуникационным технологиям, иностранным языкам;

- Формирование уровня материально-технической базы образовательного учреждения на уровне требований модульного обучения (например, соответствующие планы уроков, доступ к сети Интернет, необходимые средства интерактивного обучения, наглядных и методических пособий);
- Высокая эффективность может быть достигнута за счет контроля достижения целей и совершенствования механизма анализа и внедрения результатов;
- Необходимо определить конкретные меры по разработке научных основ теоретическо-методической структуры модульной технологии обучения, обеспечивающей эффективное преподавание экономических наук.
- Использование интерактивных методов обучения, которые включают моделирование ситуаций из реальной жизни, использование ролевых игр и совместное решение проблем. Интерактивное обучение не только формирует у учащихся активность, творчество, самостоятельность в процессе усвоения информации, но и способствует полноценной реализации образовательных целей.

Заключение

Из сказанного можно сделать вывод, что эффективность подготовки кадров не только в проведении обучения на основе инновационных образовательных технологий, но и в обучении студентов самостоятельному обучению, новому подходу к образованию, получению необходимых и глубоких теоретических, а также практических знаний, формированию практических навыков на основе спроса на рынке труда. Кредитно-модульная система предусматривает ориентацию на профессиональное развитие и зрелости студента. Она направлена на обеспечение непрерывного обучения владельца знаний и формирование человеческого капитала, отвечающего рынку труда и современным требованиям.

Применение интерактивных методов обучения, внедрение модульных образовательных технологий и кредитно-модульной системы в образовательной практике являются важными показателями повышения качества образования.

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RELATIONSHIP BETWEEN LANGUAGE AND STEAM LEARNING FOR ENGLISH LEARNERS

U. Irgasheva

Abstract. The article proves the relationship between language and STEAM learning for English learners. English learners (ELs) develop science, technology, engineering, art and mathematics (STEAM) knowledge and language proficiency when they are engaged in meaningful interaction in the classroom and participate in the kinds of activities in which STEAM experts and professionals regularly engage. This article provides the views of the inextricable relationship between language and content. It articulates the ways in which ELs can be afforded opportunities in the lesson using STEAM technologies to draw on language and other meaning-making resources while engaging in disciplinary content. The role of language and culture in STEAM learning is explained in the article.

The purpose of the article is to provide some recommendations for using STEAM technology in teaching English as a foreign language. Learning STEAM technology involves extending students' meaning-making potential through language. To engage effectively with disciplinary learning, students expand their repertoires of language skills developed during the early years of schooling and learn to recognize how language is used to make meaning, discuss ideas, present knowledge, construe value, and create specialized texts across disciplines. This expansion of students' language repertoires is observed in the science, mathematics, and engineering classroom as ELs use language purposefully in the service of "doing" and communicating ideas about science, engineering, and mathematics. Just as each discipline requires that students engage with a specialized body of knowledge and practices, each also requires that students engage with the specialized language through which the knowledge and practices are presented.

Key words: conceptualizing, evaluating, engaging, engagement, encourage, multicompetence, content, structure.

INGLIZ TILINI O'RGANUVCHILAR UCHUN TIL VA STEAM O'RGANISH O'RTASIDAGI BOG'LIQLIK

Irgasheva U. R.

Annotatsiya. Maqolada ingliz tilini o'rganuvchilar uchun til va STEAM o'rganish o'rtasidagi bog'liqlik isbotlangan. Ingliz tilini o'rganuvchilar fan, texnologiya, muhandislik, san'at va matematika (STEAM) bo'yicha bilim va tilni bilish darajasini, ular sinfda mazmunli o'zaro aloqada bo'lganda va STEAM

mutaxassislari muntazam qatnashadigan tadbirlarda qatnashganda rivojlanadi. Ushbu maqolada til va mazmun o'rtasidagi uzviy bog'liqlik haqidagi qarashlar keltirilgan. U intizom mazmuni bilan shug'ullanayotganda til va boshqa ma'no yaratuvchi resurslardan foydalanish uchun STEAM texnologiyalaridan foydalangan holda darsda ingliz tilini o'rganuvchilarga qanday imkoniyatlarni taqdim etish usullarini bayon qiladi. STEAM o'rganishda til va madaniyatning roli maqolada tushuntirilgan.

Maqolaning maqsadi ingliz tilini chet tili sifatida o'qitishda STEAM texnologiyasidan foydalanish bo'yicha ba'zi tavsiyalar berishdir. STEAM texnologiyasini o'rganish talabalarning til orqali ma'no yaratish salohiyatini kengaytirishni o'z ichiga oladi. Intizomiy ta'lim bilan samarali shug'ullanish uchun talabalar maktabning dastlabki yillarida shakllangan til ko'nikmalari repertuarini kengaytiradilar va tildan qanday ma'no yaratish, g'oyalarni muhokama qilish, bilimlarni taqdim etish, qiymatni shakllantirish va fanlar bo'yicha maxsus matnlarni yaratish uchun qanday foydalanilishini tushunishni o'rganadilar. Talabalar til repertuarining bu tarzda kengayishi tabiatshunoslik, matematika va muhandislik sinflarida kuzatiladi, chunki ingliz tilini o'rganuvchilar fan, muhandislik va matematika haqidagi fikrlarni "bajarish" va yetkazish xizmatida tildan maqsadli foydalanadilar. Har bir fan o'quvchilarning maxsus bilim va amaliyotlar majmuasi bilan shug'ullanishini talab qilganidek, har biri ham talabalardan bilim va amaliyotlar taqdim etiladigan maxsus til bilan shug'ullanishni talab qiladi.

Kalit so'zlar: kontseptsiyalash, baholash, jalb qilish, jalb qilmoq, rag'batlantirish, ko'p kompetentsiya, mazmun, tuzilma.

Introduction

All children grow up in communities that use language to engage in cultural practices that have developed historically and are shaped in ongoing ways to achieve the goals and values of the communities. Each community has particular ways of conceptualizing, representing, evaluating, and engaging with the world, and initially children are socialized into the language and ways of being in their families and local communities. Over time, however, each person becomes a member of a larger set of communities and engages in new cultural practices that are sometimes complementary but may sometimes conflict with the practices of their home communities. For most children, these new communities include both in-school and extracurricular affiliations through which they engage in new cultural practices. Any particular student coming from a home community into a school context may present herself or himself in a variety of ways, including ways that may or may not be consistent with stereotypes of the home communities or different cultural groups. Expecting individuals to act or think in particular ways

because of their group memberships limits those individuals' opportunities to learn and constrains their opportunity to thrive in educational settings. Schools are enriched through the diverse experiences and perspectives of children and families from different cultural communities, and ELs simultaneously bring unique experiences as individuals and as knowledgeable members of the communities to which they belong. All of these experiences, individual and collective, can provide resources for learning STEAM.

Once they enter preschool, children encounter communities of academic disciplines, and they leverage their existing linguistic and cultural resources as they begin to engage in this context. The STEAM disciplines constitute communities in which language and other ways of making sense of the world have evolved to enable participants to accomplish their functional goals. STEAM subjects offer the potential for membership in the communities of mathematicians, scientists, engineers, and other technical experts—communities with their own ways of conceptualizing, representing, evaluating, and engaging with the world. In turn, STEAM students from a wide range of backgrounds bring the potential to contribute to shaping STEAM fields in critical ways that transform and remake focal topics, practices, and contributions. Language is simultaneously a cognitive ability and a cultural resource that children first learn to draw on in their homes and communities. As they interact with caregivers in the early years, the language they develop enables them to participate in the community's cultural practices and learn its ways of being, as well as to organize and make sense of their complex worlds. For example, children begin to learn about cause and effect in everyday contexts as they experience and talk about conditions, purposes, and reasons. Their understanding of cause and effect develops along with the language through which causal relationships are expressed (e.g., through language such as *if you see a snake, don't touch it because it may be dangerous*). Through many such interactions, they learn both the language and values of their culture and are introduced to concepts relevant for later STEAM learning. For some children, this development occurs in more than one language. When children enter school, they begin to use language in new ways and encounter new cultural practices through talk, text, and other systems for sharing meaning (e.g., gesture, visual display) and making sense of the world. These new ways of using language can build upon and enhance children's experiences, as well as encourage new ideas and knowledge. Across school subjects, as children learn new concepts, they also learn new *discourse* patterns, new ways of using language to interact with all of their meaning-making resources to share their perspectives as they engage with the concepts. In other words, language development and concept development occur simultaneously; in humans, language development and concept development are inextricable. As learners add concepts and language, adding new concepts through

language becomes progressively easier as the linguistic skills and abilities of the learner increase. The learner possesses a broader and deeper foundation upon which to layer new concepts and language. Concept development is made more challenging for ELs to the extent that educators rely exclusively on the English language to develop concepts and may not recognize the added challenge of learning new concepts in a language that one is also learning.

To learn STEAM subjects, students will learn the requisite new patterns of language and expression only through opportunity for and engagement in STEAM disciplinary practices. The developmental pathways available to individual learners in STEAM classrooms are influenced by the opportunities they are offered to participate in the practices and discourses of STEAM fields. Participation in these practices and discourses increases learners' capacities to generalize and express abstract ideas, develop disciplinary habits of mind and dispositions, and achieve success in STEAM learning. Learning STEM subjects requires support for learning to use the discourse patterns through which the knowledge in each subject area is presented and engaged with. All children require such support, including those learning in their mother tongues or first language (also referred to as L1). For ELs, success often hinges on engaging in classroom and out-of-school experiences that encourage them to draw on the languages and multicompetences they already control and to connect new concepts with the knowledge they bring from their homes and communities. When allowed to interact in varied ways to build from what they already know and to develop new technical knowledge at school, ELs can learn STEAM content and practices while simultaneously building their proficiency in English beyond STEAM.

Methods

Language is experienced as sounds and wordings (words/phrases), but the primary *function* of language is to make sense of the world and share meanings with others. The use of language is to "make meanings" that fulfill goals in the social contexts where people interact. The meanings vary not only according to what is being done (the "content"), but also according to with whom the interactions take place (e.g., how many people are present, the status of the relationships, the roles taken on in the discourse, etc.) And it is not just in language that people interact. Along with language, nonlinguistic modalities—including gesture, visual displays (e.g., symbols, diagrams, graphs, tables), and other multimodal representations (e.g., in everyday life, maps, emojis, pictures, etc.; in STEAM subjects, artifacts of engineering design, computational modeling, etc.)— offer different affordances and limitations, potentials, and constraints for meaning-making.

It is important to recognize that the content taught in STEAM subjects is not separable from the language through which the content is presented. There is no

language-free content; language use always presents some content, and most representations of content require some language use, even with multimodal resources for meaning-making. This understanding of language means that to learn the language of STEM subjects, students must participate in STEM contexts and activities. For ELs, this means that they must be encouraged to draw on all of their multicompetences, which include all of their languages and their different varieties, as well as gesture, drawing, and other modalities for meaning-making.

Language is used in different ways depending on what is being done—making different language choices in doing mathematics than in doing science, for example—and who is being spoken to (e.g., a friend or family member versus a stranger) and the mode of communication (e.g., talking on the phone or writing a letter). Linguists use the term *register* to refer to this kind of variation in the ways that meaning making resources are drawn upon. *Register* refers to the different ways people draw on linguistic and nonlinguistic resources as they engage in different kinds of activities, with different kinds of people, through different modes of communication. Students use multiple registers as they engage in classroom activities in the same ways, they use multiple registers as they engage in activities outside of school. Different words are used in mathematics than in science. But consider how different *modalities* present and enact meaning; for example, by writing rather than speaking, and how different wordings depending on the *relationship* of the speakers, for example, whether speaking one-on-one or with a small group. The registers used respond to the contexts participated in, so shaping contexts to enable students to expand their linguistic repertoires is an important goal of instruction in all subjects; adding new registers and developing existing registers is a main goal of schooling. The notion of register helps point out how teachers can engage learners in activities that build from everyday ways of interacting toward more formal ways of presenting disciplinary meanings, as well as how learners can unpack disciplinary meanings into language that connects with the language and meanings they bring to the classroom. The notion of register also helps teachers recognize students' subject-matter understandings even as their proficiency in English is still developing. Within the same classroom, different activities offer learners different affordances for drawing on language and the multicompetences they already are comfortable with and for learning new ways of making meaning that are subject-specific.

"Content" can be held constant as students who are learning English engage with the same concept in different ways across a set of activities designed to involve them in sense-making as they learn STEAM subjects. Els who are less proficient in English may be most confident in participating when encouraged to use a range of modalities and work in a small group setting with peers, while those

with greater proficiency may participate in imperfect but comprehensible English and interact in whole class settings.

While different participation structures present different challenges and affordances to particular students, language will develop as students have multiple opportunities to engage with the same content and concepts over a unit of study. The particular ways to talk and write (discourse patterns) about the content will not be the same across the unit. Introducing and working with a concept initially, students may use everyday language and informal vocabulary and sentence structure. As they become more familiar with the technical aspects of the STEAM concepts they are learning and the STEAM practices they are engaging in, they move toward more disciplinary ways of talking about what they are learning, using technical language, sentence structure, and arguments more typical of written or formal discourse. This is how students develop new academic registers at the same time they learn new concepts, and teachers' awareness of the affordances of this register development over time can enable them to challenge ELs.

For example, in a unit of instruction about division with fractions, the activities that students can engage in move from hands-on interaction to reporting on the interaction and then writing about what was learned. In moving across these different activities, students work in different participation structures and use different modalities, even while the underlying "content," understanding and using the concept of division by a fraction in a word problem involving the *measurement* meaning of division (not the *partitive* meaning used in "fair share" problems), remains the same. A textbook represents yet another register with which students must engage; this register presents a mathematical generalization about the meaning of division by fractions in a sentence that distills several concepts into technical language accompanied by an equation in mathematical symbolic language. To understand this technical language, teacher and students are likely to engage in further talk and interaction that "unpacks" the technicality and uses more everyday register features to help learners see meaning in what is represented through mathematical symbols.

Through opportunities to engage with language in all these different forms of interactions, none of which is inherently "better" or "more appropriate" than any others in the abstract, learners are enabled to move between the language(s) and registers they bring to the classroom and the new registers they are learning to engage with as they participate in STEAM learning. With textbooks, through which students are exposed to the written language of the disciplines, stylistic differences in language are also well-documented. This understanding of language suggests important implications for providing instruction and supports that will engage and challenge ELs and enable their success in learning STEAM content, concepts, and practices. The committee reports on what is known about how best to support high-

quality instruction for ELs; with more evidence in science and mathematics than in technology and engineering. This understanding of language is also fundamental to preparing teachers to create learning environments and design STEAM instruction that is effective with diverse learners, including ELs. Chapter 6 reports on research that shows how teachers' knowledge about language and STEAM can be developed in preservice and in-service contexts. It is the committee's stance that through participation in such STEAM learning contexts that engage all learners in using all of their meaning-making capacities, ELs will develop English language proficiency along with subject area knowledge, understanding, and practices.

Recent years have witnessed parallel shifts toward promoting the social and sense-making nature of both science learning and second language development. In science education, whereas traditional views focused on individual learners' mastery of discrete elements of science content, contemporary views emphasize that students engage in science and engineering practices (e.g., developing models, arguing from evidence, constructing explanations) to make sense of the world around them.

The new vision of science education expects students to engage in science and engineering as scientists and engineers carry out their work. In the science classroom, students make sense of phenomena or design solutions to problems by engaging in three-dimensional learning. In doing so, they build their science understanding with more sophistication over the course of instruction. The *Framework* recommends organizing science learning around three dimensions: scientific and engineering practices, crosscutting concepts, and disciplinary core ideas.

The first dimension of scientific and engineering practices includes the following:
1. Ask questions (for science) and define problems (for engineering)
2. Develop and use models
3. Plan and carry out investigations
4. Analyze and interpret data
5. Use mathematics and computational thinking
6. Construct explanations (for science) and design solutions (for engineering)
7. Engage in argument from evidence
8. Obtain, evaluate, and communicate information

The second dimension of crosscutting concepts, which unify the study of science and engineering through their common application across fields include patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change. The third dimension includes disciplinary core ideas in four areas: physical sciences; life sciences; earth and space sciences; and engineering, technology, and

applications of science. The Next Generation Science Standards, written as performance expectations, blend these three dimensions to express what students should be able to do at the end of a grade band or grade level.

Results

As lessons fit together coherently and build on each other over the course of instruction, students develop deeper and more sophisticated understanding of science to make sense of the anchoring phenomenon for the unit of science instruction. As ELs develop deeper and more sophisticated science understanding over time, their language use becomes more sophisticated. To communicate the sophistication of their ideas, ELs use modalities more strategically (e.g., they may use dots to represent particles of smell, arrows to represent movement of smell particles, and different shapes or colors to distinguish between smell particles and air particles that are intermingled) and more specialized registers (e.g., they progress from "it stinks" to "smell is a gas made of particles too small to see that are moving freely in space and reaching my nose").

The specialized register allows ELs to be more precise as their science understanding becomes more sophisticated. Precision goes beyond science vocabulary (e.g., "particles") and privileges disciplinary meaning by focusing on how ELs use language to engage in science and engineering practices. For example, in constructing a scientific explanation of how smell travels across the room, ELs can communicate precise disciplinary meaning about the scale at which gas particles can be observed ("too small to see") and the movement of the particles ("move freely around in space") with less sophisticated language. As ELs use language in a variety of settings—individually, in pairs, small-groups, and whole-class settings—they learn to adapt their language to meet the communicative demands of different interactions ("check this out" in one to-one interaction when there is a shared frame of reference, "the food materials are decomposing and producing smell" in one-to-many interaction when language needs to be explicit). Overall, the science classroom presents a rich science learning environment that also promotes language learning for all students, including ELs, who benefit from sustained opportunities to *use language to do science* [5]. The science classroom may be particularly beneficial to ELs when their contributions are valued for the merit of their ideas regardless of social status or linguistic accuracy. They communicate their ideas using a wide range of semiotic resources, including home languages, linguistic and nonlinguistic modalities of science disciplines, and registers starting from every day to specialized language to meet the communicative demands of different types of interactions in the science classroom. Language is a product of doing science, not a precursor or prerequisite for doing science and ELs need ample opportunities to do science. and applying knowledge for a particular purpose, it has been referred to as *knowledge-in-use*. In second-

language development, whereas earlier theories saw it as the accumulation of discrete elements of vocabulary (lexicon) and grammar (syntax) to be internalized by learners, more recent thinking has taken a sociocultural turn, viewing language as a set of dynamic meaning-making practices learned through participation in social contexts [8]. Because this approach to language learning involves using language for a particular purpose, it has been referred to as *language-in-use*. Knowledge-in-use in science education and language-in-use in second-language development complement each other, such that science instructional shifts promote language learning with ELs, while language instructional shifts promote science learning with ELs.

Discussion

The importance of discourse processes in science education builds from longstanding research examining the multiple ways language supports the creation of knowledge. In particular, sociocultural approaches brought more focused attention to the role of cultural tools such as language in mediating the processes of individual learning and cultural production and change. This perspective offers an important opportunity to see how scientific knowledge accrues and changes over time as well as how knowledge is created and negotiated through social engagement and discussion in classroom settings. As will be further articulated in the Mathematical Practices section below, classroom activities should be constructed to be developmentally appropriate approximations of scientific practices. Research on science practices often focuses on the establishment and evaluation of knowledge claims. These epistemic practices are central to learning the disciplinary knowledge and ways of being for various science fields. Such practices vary across disciplinary communities, ways of knowing, and power dynamics that also operate in the presentation of cultures. Those epistemic practices leading to generalized knowledge claims about nature tend to be legitimized in disciplinary communities in science and engineering, drawing on work in the philosophy of science, suggested five focal areas: (1) epistemic aims and values, (2) structure of knowledge and other epistemic achievements, (3) sources of justification of knowledge, (4) epistemic virtues and vices, and (5) reliable and unreliable processes for achieving epistemic aims. These epistemic practices of science have been examined in a number of studies.

Studies of student uses of knowledge in problem solving also entail engagement in scientific practices. This focus on everyday knowledge construction practices forms students' practical epistemology that can serve to help make sense of phenomena, to develop conceptual knowledge, and to learn about the nature of science. In each of these cases, examining student engagement in epistemic or scientific practices relies on a methodological focus on discourse processes because

the ways that communities affiliate, build knowledge, and construct social practices are constructed in and through discourse [10].

Working in groups engages students in discourse through which they both construct knowledge and enact relationships, highlighting the social nature of science learning. By focusing on the ways that knowledge was constructed, negotiated, and valued, a number of studies identified key aspects of discourse for productive educational aims. For example, the interaction of the interpersonal and cognitive was made evident in Bianchini's study of student groupwork [1]. This study showed how students' perceived status influenced participation and science learning. A number of studies illustrated how access to scientific knowledge was negotiated through discourse processes and tied to the ongoing social practices and norms of the classrooms. An important development in the study of classroom discourse emerged from a focus on teachers' and students' uses of evidence. The alignment of evidence in disciplinary-specific and genre-specific forms of language has entered studies of science education as argumentation. Studies of argumentation have explored different contexts, have drawn from multiple argumentation analytics for analysis, and have focused on different dimensions of science from conceptual learning to socio scientific issue. Argumentation has been applied across multiple science subject areas and entered into teacher education to prepare teachers to orchestrate uses of evidence among students [11].

Education related to technology—the T in STEM—is interpreted in a variety of. One interpretation focuses on technological literacy, which is defined as the "ability to use, manage, assess, and understand technology", and traditionally, career and technical education (CTE) programs of study have emphasized technological literacy as a goal.

A second interpretation focuses on educational, or instructional, technology as a central tool for teaching and learning (language and content) both in and out of the classroom. Some influential educational technologies to date are personal computers (as well as laptops, tablet computers, and smartphones), the Internet (including online resources and educational software), and cloud computing. A third interpretation focuses on the tools used by practitioners of science, mathematics, engineering, and beyond. These tools include computers, software, sensors, and other data collection instruments.

For all interpretations, there is limited research on technology and technology education with respect to ELs; nevertheless, we highlight what is known from the existing literature. The goal of technology education is to prepare students to make well-informed decisions about matters that influence technology or are influenced by technology. Typically, aspects of technology education are incorporated into multiple disciplines (e.g., mathematics aligned to the Common

Core State Standards, science and engineering aligned to the Next Generation Science Standards [NGSS], and computer science aligned to the Computer Science Teachers Association [CSTA] standards), but many states have also developed separate technology education standards. Yet, no explicit recommendations for supporting linguistically diverse students in meeting these standards have been outlined.

Research describing teachers' conceptualization of the role of technology in teaching and learning highlights that the primary goal is for students to become skillful communicators of the language learned rather than simply learners of the language, maximizing student autonomy and empowerment in the classroom [6]. For example, students were found to write more via computer compared to when given pen and paper, and computer-based collaborative activities encouraged more attentiveness to listening, speaking, reading, and writing. Moreover, these activities help students integrate language and culture, which led students to converse in English in more meaningful ways.

These findings have implications for how technology could support ELs in engaging in meaningful discourse beyond learning a language. Likewise, educational technologies have also been shown to benefit Els in learning science content. These visualization technologies were embedded in Web-based inquiry instruction in science, and EL and non-EL students were randomly assigned to either a static or dynamic visualization condition. Compared to the students in the static group, ELs and non-ELs within the dynamic visualization group engaged in more discourse and used both text and visual representations to make sense of the scientific phenomena.

Additionally, these students more successfully evaluated the range of ideas presented in order to develop coherent scientific explanations based on evidence from the visualizations. These findings suggest that dynamic visualization technology can support the development of coherent scientific understanding for all students, including ELs. Related to the third interpretation, computational thinking is becoming increasingly essential for all students to become STEAM professionals or participants in an information society [9]. Thus, the definition of STEAM education has been formally expanded to include computer science. There has been an emergence of the importance of adding computational thinking to "every child's analytical ability as a vital ingredient of science, technology, engineering, and mathematics (STEAM) learning". Computational thinking "involves solving problems, designing systems, and understanding human behavior, by drawing on the concepts fundamental to computer science" and involves key aspects, such as abstraction, pattern generalization, representational competence, modularization, algorithmic notions of flow of control, and conditional logic.

Despite the growing emphasis on computational thinking in STEAM education, incorporating computational thinking in the school curriculum faces challenges. One major challenge involves lack of an agreement on what constitutes computational thinking. One approach emphasizes computer literacy, which generally involves using tools to create newsletters, Web pages, or multimedia presentations. A second approach emphasizes computer science by teaching students about programming in particular languages as a way to process, analyze, and interpret information with an emphasis on key computer science concepts such as abstraction, modularization, loops, and conditionals. A third approach emphasizes programming applications, such as games, robots, and simulations, often with an emphasis on students' participation and identity in authentic communities and practices. A fourth approach emphasizes learning to think computationally as a fundamental analytical skill that everyone, not just computer scientists, can use to help solve problems, design systems, and understand human behavior. This approach mirrors the growing recognition that computational thinking (and not just computation) has begun to influence and shape thinking in STEAM disciplines and beyond. Few studies have examined instructional materials that enable teachers of STEAM subjects to support ELs in developing computational thinking.

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III. ОПЫТ РЕАЛИЗАЦИИ ПРОЕКТОВ ERASMUS+

АНАЛИЗ ФАКТОРОВ, ВЛИЯЮЩИХ НА УСПЕШНОЕ ВНЕДРЕНИЕ КРЕДИТНО-МОДУЛЬНОЙ СИСТЕМЫ В ВЫСШЕЕ ОБРАЗОВАНИЕ УЗБЕКИСТАНА

Турениязова А. И.

Аннотация: Современное образование основано на индивидуализации и дифференциации образования, альтернативности образовательных систем и учебных заведений, гибкости и динамичности учебно-программной документации, адаптивности к изменяющимся условиям социально-экономической среды. Как показывает практика, кредитная система обучения, распространенная в университетах большинства стран мира, является наиболее гибкой и эффективной. Она обеспечивает академическую мобильность и востребованность выпускников в стремительно меняющихся условиях рынка труда. Во многом это обеспечивается за счет гибкого планирования академических программ, ориентированных на запросы рынка труда, элективностью дисциплин учебного плана, повышением качества

преподавания, повышением роли самостоятельной работы студента. **Кредитная технология обучения — это сложная система,** требующая для успешного функционирования множества согласованных факторов. В статье рассматривается ряд аспектов, связанных с внедрением кредитно-модульной системы на основе ECTS в высшее образование Узбекистана, и анализируются факторы, свидетельствующие о недостаточно полном использовании механизмов КМС ВУЗами республики.

Анализ показывает, что такие элементы ECTS как реализация права студента на разработку индивидуальной траектории обучения, мобильность, прозрачность, признание результатов обучения, освоенных в различных контекстах обучения, включая неформальное и информальное (спонтанное), повышение роли самостоятельной работы студентов, недостаточно используются отечественными ВУЗами. В статье предлагается использовать опыт, наработанный в программах Tempus и Erasmus+, и потенциал подготовленных в проектах тренеров и экспертов в области европейского образования и, в частности, кредитной системы обучения, для повышения эффективности осуществляемых реформ.

Ключевые слова: кредит, модуль, кредитно-модульная система (КМС), ECTS, студент-центристское образование, результаты обучения, оценка, качество, мобильность, самостоятельная работа.

ANALYSIS OF FACTORS AFFECTING THE SUCCESSFUL IMPLEMENTATION OF THE MODULAR CREDIT SYSTEM IN HIGHER EDUCATION IN UZBEKISTAN

A. Tureniyazova

Abstract. Modern education is based on the individualization and differentiation of education, the alternativeness of educational systems and educational institutions, the flexibility and dynamism of educational and program documentation, adaptability to changing conditions of the socio-economic environment. As practice shows, the credit system of education, common in universities in most countries of the world, is the most flexible and efficient. It provides academic mobility and demand for graduates in a rapidly changing labor market. This is largely ensured by the flexible planning of academic programs oriented to the needs of the labor market, the electivity of the disciplines of the curriculum, improving the quality of teaching, and increasing the role of the student's independent work. Credit technology of education is a complex system that requires many coordinated factors for successful functioning. The article discusses a number of aspects related to the introduction of a credit-modular system

based on ECTS in higher education in Uzbekistan, and analyzes the factors that indicate the insufficient use of CMS mechanisms by the universities of the republic.

The analysis shows that such elements of ECTS as the realization of the student's right to develop an individual learning path, mobility, transparency, recognition of learning outcomes mastered in various learning contexts, including non-formal and informal (spontaneous), increasing the role of students' independent work, are not used enough by domestic universities. The article proposes to use the experience gained in the Tempus and Erasmus + programs, and the potential of trainers and experts in the field of European education and, in particular, the credit system of education, prepared in the projects, to improve the effectiveness of the ongoing reforms.

Key words. Credit, module, credit-modular system, ECTS, student-centered, learning outcomes, assessment, quality, mobility, independent work.

Введение

Кредитная система – это асинхронная (в отличие от традиционной - «линейной») модель организации учебного процесса. В нее входят все обеспечивающие ее механизмы, включая кредитную технологию учета, систему выбора учебных курсов, принципы выставления оценок, набор критериев получения диплома, правила перевода с курса на курс, правила конвертации полученных кредитов при переводе в другой вуз и т.д. Именно кредитная система имеет возможность подготовить студентов к профессиональной деятельности в условиях современного информационного (постиндустриального) общества и при правильной организации и построении учебного процесса может стать залогом высокого качества образования.

Внедрение кредитной технологии обучения позволяет не только войти в мировое образовательное пространство, но и существенно интенсифицировать процесс обучения студентов в высшем учебном заведении. На смену традиционному (авторитарному) стилю обучения приходит понимание образования как достояния, где учитывается субъектный опыт и потенциал отдельной (каждой) личности как средство ее самореализации и самоактуализации в жизни, построения личной карьеры. Это изменяет цели обучения и воспитания, его мотивы, нормы, формы, методы, роль педагога в образовательной среде и т.д. Еще одна особенность кредитной системы связана с переносом акцента со знаниево-ориентированной направленности в подготовке специалистов на компетентно-ориентированную, где во главу угла ставятся не столько теоретические знания, «оторванные» от практики, сколько компетенции. КМС требует организацию учебного процесса в условиях достижения

максимальной индивидуализации обучения будущих специалистов. Эта особенность данной системы позволяет производить выбор только тех модулей и соответственно кредитов, которые студент может усвоить в силу своих особенностей и уровня обученности; производить выбор преподавателей в соответствии со своими представлениями о предмете, будущей специальности, то есть самостоятельно планировать индивидуальную образовательную программу, что повышает уровень мотивации и обеспечивает высокую роль самообразования студента.

Существенным фактором, обеспечивающим успешность КМС, является активная вовлеченность работодателей в учебный процесс с момента формиро-вания квалификационных требований через непрерывный мониторинг процесса подготовки будущего специалиста, предоставление площадки для прохождения производственной практики, оценку промежуточных результатов обучения, создание базы тем для курсовых, выпускных квалификационных работ и финальной оценки компетенций выпускника.

Методы исследования.

Основу методологии исследования составили сравнительный анализ механизмов и инструментов кредитно-модульной системы европейского и национального высшего образования, на основе опыта работы автора в проектах Erasmus+ RUECVET: Пилотирование ECVET – Европейской кредитной системы для профессионального образования в национальные системы образования России и Узбекистана и MAGNET: Университеты как ключевые партнеры сети профессионального обучения населения среднего возраста, а также практики внедрения КМС в ВУЗах республики.

Исследование проблемы

В целях развития качества образования на основе зарубежного опыта, приведения национальной системы высшего образования в соответствие с международными стандартами, в Указе Президента Республики Узбекистан № 5847 "Об утверждении концепции развития системы высшего образования Республики Узбекистан до 2030 года" была поставлена задача по поэтапному переводу учебного процесса высших образовательных учреждений на кредитно-модульную систему [1]. На сегодняшний день завершается четвёртый учебный год с момента введения КМС в ряд экспериментальных ВУЗов республики и первый год работы всех остальных высших учебных заведений страны по данной система обучения. Позволим себе проделать некоторый анализ результатов данной инновации с тем, чтобы определить, в какой степени данная система у нас реализована и насколько полно использованы её преимущества.

В первую очередь, следует отметить ряд явных положительных моментов внедрения КМС, как например сокращение продолжительности учебы до 15 недель в семестре, возможность переобучения студентов, введение должности тьютора вместо общественной нагрузки куратора и т.д.

Прогрессивным решением правительства, открывающим возможности для более широкого использования инструментов кредитной системы, явилось и наделение ВУЗов полномочиями независимо принимать академические и организационно-управленческие решения [2].

Однако несмотря на достижения в этой сфере, утверждать о полной реализации механизмов кредитно-модульной системы для обеспечения качества подготовки кадров в высшем образовании республике ещё рановато.

За основу КМС высшего образования Узбекистана была принята Европейская, ECTS. Разберём основные элементы ECTS по определению, данному в Руководстве [3].

> ECTS является **студенто-центрированной** системой **накопления** и **переноса** зачетных единиц, основанной на принципе **прозрачности** обучения, **преподавания** и **оценки**. Благодаря подходу **на основе результатов обучения,** ECTS содействует **признанию ранее полученного обучения и опыта**, укрепляет связь между образовательными программами и потребностями общества и взаимодействие со всеми заинтересованными сторонами, а также содействует **мобильности** в рамках вуза или страны, между вузами, странами или между различными секторами системы образования и **контекстами обучения (формальным, неформальным, спонтанным или на рабочем месте)** благодаря признанию и переносу зачетных единиц.

Зададимся вопросом, насколько каждый выделенный элемент определения ECTS присутствует в нынешней кредитной системе.

Студенто-центрированная система, прозрачность. СЦС предполагает повышение роли и степени участия студента в планировании собственного образования. Для этого каждый ВУЗ размещает на своём сайте информационный пакет – один из важнейших документов ECTS, с помощью которого программы обучения становятся прозрачными. Представленная в пакете информация позволяет абитуриентам сделать выбор в пользу конкретного вуза, факультета, образовательной программы, а студентам – наиболее полно представить все возможности своего образования и спланировать свою (индивидуальную) образовательную траекторию, выбрать модули и преподавателей. К сожалению, нельзя с уверенностью сказать, что такой полноты информация в настоящее время предоставляется. Зачисление студента в определенную группу, с которой 4 года он идёт до получения

квалификации, осваивая вместе со всеми одинаковые для всех обязательные и только так называемые «дисциплины по выбору», с заранее определёнными преподавателями, которым данные предметы распределены в качестве учебной нагрузки, не оставляет студенту никакого выбора.

Говоря о прозрачности оценки студента, нельзя не остановиться на вопросе: Что и как оценивается? Насколько студент в самом начале модуля осведомлён об условиях/требованиях присуждения ему кредитов за данный модуль? Насколько правильно сформулированы **результаты обучения (РО)** –знания, навыки и компетенции, которые он должен продемонстрировать к концу обучения? Насколько чётко описаны **критерии оценки** достижения этих РО? Насколько преподаватели, разрабатывающие syllabus (рабочую программу) модуля, знакомы с методикой разработки таких программ – блоков результатов обучения (units of learning outcomes) в ECTS, с правилами форму-лировки РО, такими как их оптимальное количество, использование активных глаголов, необходимость взаимосвязи требуемых навыков с общепрофессио-нальными навыками, исходящими из квалификационных требований и т.д.? Существует специальная методика, и ей необходимо обучить разработчиков учебных программ. Отсутствие владения данной методикой приводит к тому, что в некоторых нынешних Syllabus указаны 24 РО (есть оптимальная норма, а слишком много значит слишком общо, расплывчато, повторяется – и у студента нет чёткого представления о том, что именно он должен продемонстрировать для получения кредитов по данному модулю), ряд учебных программ в качестве РО содержит только требования к теоретическим знаниям (знает, понимает), не включая обязательные навыки и компетенции, критерии оценки достижения требуемых РО также чётко не прописаны. Кстати о вопросе оценки РО, во многих университетах используются 2 формы - письменная работа и тест, которые хороши для оценки теоретических знаний, но не всегда позволяют оценить навыки и компетенции студентов.

Признание ранее полученного обучения и опыта. ECTS помогает разрабатывать, описывать и реализовывать программы, позволяя интегрировать различные типы обучения в процесс обучения в течение всей жизни, а также способствует развитию мобильности студентов путем упрощения процесса признания квалификаций и периодов обучения. Она может быть применена ко всем программам вне зависимости от формы реализации (аудиторное обучение, обучение на рабочем месте, дистанционное обучение) или статуса студентов (обучающиеся по полной форме, вечерники, заочники), а также ко всем видам обучения (формальное, неформальное и спонтанное).

Мобильность студентов является одним из основных элементов кредитной системы высшего образования. Ежегодно десяткам студентов и сотрудников ВУЗов предоставляется возможность поездки в ведущие европейские ВУЗы в рамках программы международной кредитной мобильности ICM Erasmus+. Студенты и исследователи, участвуя в партнерствах мобильности, получают доступ к более качественным образовательным и исследовательским программам и возвращаются в свой вуз с новым багажом знаний. Опыт обучения за рубежом обеспечивает выпускникам способность работать в межкультурной и глобальной межнациональной профессиональной среде. Дисциплины или модули по соответствующим специальностям, пройденные в партнерском университете, были признаны сторонами, и освоенные кредиты автоматически перезачитываются [4].

К сожалению, на данном этапе развития кредитной системы в республике нельзя говорить о широких масштабах студенческой мобильности, хотя бы внутренней. Результаты обучения для всей учебной программы в другом вузе должны быть совместимыми с результатами обучения по основной программе в направляющей образовательной организации или дополнять их. Они подлежат признанию после периода обучения в другом вузе. Это позволяет более гибко замещать эквивалентное количество зачетных единиц по основной программе направляющего вуза зачетными единицами, полученными в принимающей организации. Соглашение об обучении должно определить набор учебных элементов, которые будут изучаться студентом в принимающей организации, и то, как они будут интегрированы в основную программу направляющего вуза. В связи с вышеизложенным для внедрения программ мобильности ректорам вузов в первую очередь необходимо дать полномочия для подписания договоров по мобильности с другими национальными и зарубежными вузами. [5] Ввиду ограниченности финансовых средств и отсутствия языковой подготовки студентов для поездок за рубеж, в условиях предоставления всё большей самостоятельности местным ВУЗам, их руководители вполне могут положить на регулярную основу студенческий обмен между смежными университетами республики.

Результаты проверки деятельности учебных заведений Республики Каракалпакстан в марте текущего года Государственной инспекцией по надзору за качеством образования при Кабинете Министров РУ показали низкую обеспеченность ряда ВУЗов лабораторным оборудованием (как можно при этом обеспечивать качество?), а также тот факт, что студент был вынужден осваивать необходимые ему компетенции в определенной области не в родном ВУЗе, а в частной фирме. Напрашивается вывод, что в условиях

неполной готовности государственных образовательных учреждений (формальное образование) удовлетворить спрос (студента, работодателя, мирового рынка) и для реализации прав студентов на выбор своей траектории обучения, пришла пора внедрения норм и правил оценки и признания компетенций, полученных и в других контекстах образования, предоставив им доступ к различным видам образовательного опыта в другой среде и засчитав их результаты обучения присвоением кредитов.

Признание неформального и спонтанного обучения повышает социальную ориентацию вузов. Расширение учащимся возможностей доступа к профессиональной жизни, а также ряд нетрадиционных методов обучения способствуют существенному расширению возможностей непрерывного обучения и претворения в жизнь принципов ECTS.

Высшие учебные заведения должны быть компетентны в части признания зачетных единиц, приобретённых в результате обучения за пределами формального контекста обучения: в ходе трудовой деятельности, волонтёрства, самостоятельного изучения предмета при условии, что эти результаты обучения удовлетворяют требованиям квалификации или её компонентов. Признание результатов обучения, освоенных в рамках неформального и спонтанного обучения, должно автоматически приводить к присуждению того же количества зачётных единиц ECTS, что и за соответствующую часть программы формального образования. Признание означает, что количество зачетных единиц, полученных за достижение сопоставимых результатов обучения в ином контексте, замещает количество зачетных единиц, установленное для сопоставимых результатов обучения в образовательном учреждении, выдающем диплом.

Для осуществления процедур признания РО, полученных в иных контекстах образования, уполномоченные агентства должны внедрить соответствующие процедуры оценки и валидации этих РО. При этом желательно использовать открытый и гибкий подход к признанию зачетных единиц (кредитов), полученных в неформальном и информальном контекстах, в том числе в результате мобильности, который должен быть основан на сопо-ставимости результатов обучения, а не эквивалентности содержания курса.

И еще один вопрос, касающийся качества выпускаемых кадров и соответствия их рынку труда. В Европе работодатель напрямую заинтересован в качестве принимаемых на работу кадров, и именно работодатель формулирует квалификационные требования к выпускаемым специальностям. Неформально участвует при разработке этих требований, а активно их диктует. О важности этого фактора в системе Учебное заведение – Работодатель свидетельствует следующий факт. При опросе руководителей

местных ИТ предприятий, удовлетворены ли они качеством выпускников одного из ВУЗов, представителем мобильного оператора был дан отрицательный ответ, с пояснением, что принятых на работу новобранцев нужно еще полгода обучать необходимым навыкам. Выяснилось, что отлично владеющий информационными технологиями выпускник не умеет работать с клиентами, не умеет рекламировать, продавать продукцию компании, не знаком с базовыми правилами маркетинга. Причиной тому не низкое качество преподавания в данном ВУЗе, а то, что в программу подготовки специалиста по данному направлению не входит такой предмет как маркетинг или, например, психология клиента, а результаты обучения предметам не содержат такие навыки как умение анализировать спрос и предложение, навыки коммуникации, умение работать в команде, оценка его компетенций не предполагала умение презентовать и продвигать продукт. Виной тому нечётко сформулированные работодателем квалификационные требования, их которых должны были быть определены общие результаты обучения, на основе которой разрабатывается программа обучения, подбираются учебные модули с прикреплением к ним определенных РО. Нельзя здесь не вернуться опять к вопросу правильной формулировки РО. Европейские блоки результатов обучения даже по дисциплинам специальности включают несколько видов навыков: прикладные навыки и умения, навыки суждения, навыки коммуникации, навыки профессионального развития (обучения), в то время как в отечественных учебных программах (типовые и рабочие учебные программы) в основном описываются лишь прикладные навыки.

Следует шире практиковать положительный опыт ведущих университетов республики, активно привлекающих работодателей к реализации образовательных программ. Их участие включает выполнение студентом дипломных, курсовых проектов на основе реальных заявок и заданий предприятий и организаций; участие в проведении исследовательских работ и внедрении результатов исследования в практику; участие в формировании каталога элективных дисциплин; участие в разработке модели специалиста (т.е. компетенций специалиста); приглашение ведущих специалистов для чтения спецкурсов и семинаров; проведение экспертизы образовательной программы; проведение защит дипломных проектов непосредственно на предприятии; включение работодателей в Попечительский Совет вуза.

В нынешней системе образования республики недостаточно реализован принцип выбора студентом дисциплин специальности и преподавателя. Большинство ВУЗов по-прежнему распределяет учебную нагрузку преподавателей кафедры в процессе подготовки Акта готовности кафедр к

новому учебному году. Это не способствует стимулированию преподавателей к работе над собой для привлечения достаточного количества студентов, да и студенты в силу ряда причин еще не полностью готовы делать такой выбор. Хотя учебная нагрузка преподавателей должна быть уменьшена в КМС, не в каждом ВУЗе это было осуществимо в силу недостаточного количества штатных единиц. Единое требование о не менее 400 аудиторных часов в год для преподавателей всех категорий не способствует использованию научного потенциала сотрудников, которые могли бы при меньшей загруженности больше времени посвятить научно-изыскательской работе с одаренными студентами и молодыми преподавателями.

Для успешной реализации КМС необходимо также обеспечить студентов учебно-методическими материалами для самостоятельной работы, обучить их методам работы с учебной и научной литературой, разнообразить формы заданий для самостоятельной работы, способных выявить не только требуемые знания, но и навыки и компетенции студента.

Заключение

В дополнение к предложениям, изложенным в основной части статьи, хотелось бы отметить, что начало ECTS - кредитной системе в высшем образовании Европы запустив старт студенческой мобильности дала программа Erasmus, и с тех пор в рамках проектов программы повышения потенциала в высшем образовании (СВНЕ) накоплен огромный опыт изучения лучших практик европейского образования. Достаточно опыта и по работе с инструментами кредитной системы.

В период выполнения проекта Erasmus+ RUECVET партнёры из Узбекистана применили методику описания блоков результатов обучения по ECVET для учебных программ профессионального образования и обучения, разработав образцы таких документов для выбранных специальностей. Ряд публикаций автора также посвящен вопросам подготовки таких программ [6,7,8]. На сайте проекта RUECVET размещено Руководство по использованию ECVET, электронное пособие, а также все разработанные в проекты методические материалы размещены на сайте проекта [9].

В ходе реализации проектов Tempus и Erasmus+ подготовлены национальные тренеры и эксперты по кредитной системе и оценке качества образования, изданы учебные пособия/руководства по использованию механизмов кредитной системы, опубликованы научные статьи по проблемам высшего образования, на сайтах проектов, в публикациях НЕО, семинарах технической помощи (ТАМ) распространяется методическая информация по инструментам повышения качества образования. Их можно и нужно активнее использовать для того, чтобы применить полученный опыт для повышения

эффективности усилий по совершенствованию национальной системы высшего образования.

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PERSPECTIVES OF HIGHER EDUCATION DEVELOPMENT IN UZBEKISTAN: A SWOT ANALYSIS

G. B. Parigi

Abstract: Erasmus+ ChildCA is a joint project organized as a feasibility study to become a structural project for a sustainable and long-lasting improvement in the organization of postgraduate medical training in CA countries, particularly in Pediatrics, Pediatric Surgery and Pediatric Neuropsychiatry. To elaborate the new curricula in strict cooperation with all stakeholders and on the basis of a deep understanding of the actual situation and of future expectations, we elaborated a questionnaire, to allow the collection of information on the vision and needs of academic staff, teachers, students, professional associations, education and health authorities. The questionnaire was structured in order to allow a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis of Higher Education in the CA countries status. The questionnaire was built with the Google modules system and circulated among all stakeholders; results were then anonymously collected and analyzed by the coordination team. 652 answers were collected, 135 of them (21%) from Uzbekistan. Strengths: Organization of courses and combination of theoretical and practical training. Weaknesses: lack of simulation-based training and of training in international medical literature consultation. Opportunities: structural expansion of horizons in the field of international cooperation, improving the program of Continuous Medical Education in the field of pediatrics. Threats: lack of support from Government, risk of brain drain, fears that differences in the education systems will not allow to change the standards.

Key words: Medical training, New curricula implementation, Pediatrics, Pediatric Surgery, Pediatric Neurology, SWOT analysis.

ПЕРСПЕКТИВЫ РАЗВИТИЯ ВЫСШЕГО ОБРАЗОВАНИЯ В УЗБЕКИСТАНЕ: SWOT-АНАЛИЗ

Париги Г. Б.

Аннотация: Erasmus+ ChildCA — это совместный проект, организованный как технико-экономическое обоснование, чтобы стать структурным проектом для устойчивого и долгосрочного улучшения организации последипломного медицинского образования в странах Центральной Азии, особенно в области педиатрии, детской хирургии и детской нейропсихиатрии. Для разработки новой учебной программы в

тесном сотрудничестве со всеми заинтересованными сторонами и на основе глубокого понимания реальной ситуации и будущих ожиданий мы разработали анкету, позволяющую собрать информацию о видении и потребностях академического персонала, учителей, студентов, профессиональных ассоциаций, органов образования и здравоохранения. Анкета была составлена таким образом, чтобы позволить провести SWOT-анализ (сильные и слабые стороны, возможности, угрозы) состояния высшего образования в странах ЦА. Анкета была составлена с помощью системы модулей Google и распространена среди всех заинтересованных сторон; затем результаты были анонимно собраны и проанализированы координационной группой. Было собрано 652 ответа, из них 135 (21%) из Узбекистана. Сильные стороны: Организация курсов и сочетание теоретического и практического обучения. Слабые стороны: отсутствие симуляционного обучения и обучения обращению с международной медицинской литературой. Возможности: структурное расширение горизонтов в сфере международного сотрудничества, совершенствование программы непрерывного медицинского образования в области педиатрии. Угрозы: отсутствие поддержки со стороны правительства, риск утечки мозгов, опасения, что различия в системах образования не позволят изменить стандарты.

Ключевые слова: медицинская подготовка, внедрение новых учебных программ, педиатрия, детская хирургия, детская неврология, SWOT-анализ.

Introduction

Erasmus+ capacity building projects have been devised to *"…help higher education institutions from partner countries to develop, modernise and disseminate new curricula, teaching methods or materials, as well as to boost quality assurance and governance of higher education institutions… [aiming at] improve skills, modernise higher education systems and institutions, and create better partnerships between the EU and education systems across the world"*. ChildCA project - *"Improvement of children care teaching as a template for upgrading medical education in Central Asia"* - has been designed by following these guidelines literally, foreseeing new curricula in children care to be adopted and implemented with modern teaching methodologies and fostering a strong partnership between 11 Higher Education Institutions (HEI), 3 based in EU Countries, namely Italy, Germany and Poland, and 8 based in Central Asia (CA) Countries, namely Kazakhstan, Tajikistan and Uzbekistan.

Health related topics are the more immediately impacting on the population: CA countries offer a good example of a situation where health infrastructures of already good standing, manned with a state-of-the-art trained staff, can make the difference. Actually, the impact of a sound academic educational improvement in

medical field can be gauged by an increased number of expected years of life in a population served by a properly updated medical staff. Life expectancy at birth is a reliable indicator of the effectiveness of a health system: the gap between Europe (Italy in particular, having the longest life expectancy in the world after Japan, 82,5 years) and Uzbekistan (75,2 years) is still relevant, with 7 years of missed life dividing the two Countries [5].

A project aiming to improve medical teaching as a whole is doomed to failure, due to the extent of the involved topics. On the other hand, a project taking into account a single medical or surgical specialty could be too narrow to act as a template for the whole medical field. The choice of Pediatrics and allied disciplines - namely Pediatric Surgery and Pediatric Neuropsychiatry - as a main topic of the project responds actually to the requisite of being on one side wide enough to cover almost all medical specialties, on the other one to be delimited enough to be manageable. Pediatrics is actually defined as the medical and surgical care of all pathologies of the child 0 to 18 years: it includes as well ancillary specialties such as imaging and laboratory. It could therefore rightfully be considered as the perfect template for a circumscribed study to be thereafter extended to cover all other medical topics. On top of that, a specific attention to Pediatrics in the new Health Care Reform Process ongoing in CA Countries, with specific emphasis given to Primary Health Care, could be of paramount importance and impact on the population.

Moreover, in CA republics one inhabitant out of four is still a child 0 to 14 years of age, therefore in the domain of pediatrics, while in Europe this ratio is much lower. Percentage of population 0 to 14 years of age is actually 23,19% in Uzbekistan and 13,45% in Italy [3]: a project devoted to the care of the child in these Countries has therefore a proportionately much greater impact on the population as a whole.

ChildCA is a joint project organized as a feasibility study to become a structural project for a sustainable and long-lasting improvement in the organization of postgraduate medical training in CA countries, not only in pediatrics but also in other fields of medicine.

The project emphasizes the importance of children care, thus contributing to reduce the infant mortality through an updated approach to the teaching of modern techniques of neonatal and pediatric care, widely resorting on the tools made available by ICT.

In particular, aims of the project are: a) to support the modernization, professionalization and internationalization of postgraduate training in the field of children care management in CA Countries; b) to support CA Countries to improve quality, relevance, planning, and delivery of postgraduate training in Children Care Management; c) to emphasize the importance of children's care in the ongoing

process of the Health Care Reform in CA countries, thus contributing to reduce the infant mortality through an updated approach to the modern techniques of neonatal and pediatric care.

Since the construction of a curricular project constitutes a process of meditation and decision-taking which will finally determine the quality of professional preparation of the trainees, it must be built in strict cooperation with all stakeholders and prepared by a deep understanding of the actual situation and of future expectations. We therefore deemed mandatory to perform a thorough analysis through a questionnaire, to allow the collection of information on the vision and needs of all involved stakeholders (academic staff, teachers, students, professional associations, education and health authorities).

Materials and methods

After a series of general questions related to some details about undergraduate and postgraduate training in Pediatrics, the questionnaire was structured in order to allow a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis of Higher Education in the CA countries status [2,7].

Strengths in SWOT analysis are the attributes within an organization that are considered to be necessary for the ultimate success of a project. Strengths are resources and capabilities that can be used for competitive advantage.

Weaknesses within the SWOT analysis formula are factors that could prevent successful results within a project.

Opportunities are classified as external elements that might be helpful in achieving the goals set for the project. These factors could involve arrival of new technologies, fulfilling of new patients' needs, update training, etc. Due to the nature of the questionnaire, respondents were requested to detail what would they like the proposed project to bring to Uzbekistan medical education system.

Threats are external factors that could gravely affect the success of the project, such as old regulations that cannot be changed, external negative influences, lack of funding, lack of willingness to open the mind to new ideas, etc.

The questionnaire was built with the Google modules system and circulated among all stakeholders through a strenuous work of the national and local project coordinators; results were then anonymously collected and analyzed by the coordination team.

Having the questionnaire being built just before the onset of COVID-19, no mention of it can be found on the results.

All over ChildCA project we collected 652 answers, with a fairly even distribution among partner Countries as can be seen in fig. 1. In this paper we will discuss only the 135 answers received from Uzbekistan, equivalent to the 21% of the total.

Answers' analysis has been done calculating the percentages of respondents choosing a particular item among those proposed by the questionnaire (usually regardless of their status of student or fully trained MD or Faculty member) when numerousness of the sample made this method well-grounded; in case of a reduced number of answers it will be presented a non-quantitative summary of what answered, in some cases quoted verbatim "*in italics and in quotes*".
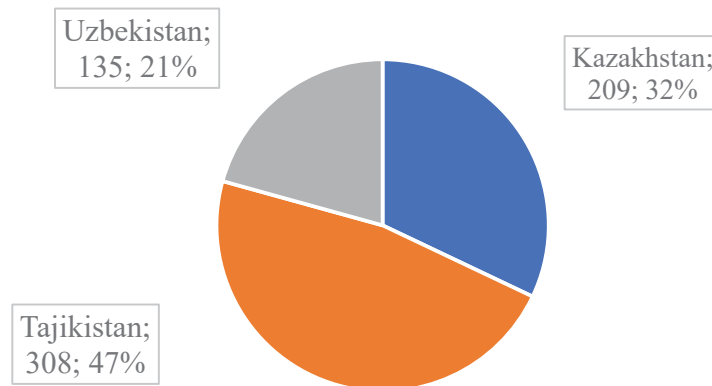

Figure 1. Questionnaires received / Country

Results

Before presenting an analysis of the answers received we must emphasize two possible bias that could somewhat alter our conclusions.

The first is related to a possible involuntary "selection" of respondents, considering that – being the compilation of the questionnaire a completely free exercise, based only on the good will of the consulted people – the reference sample cannot be considered as fully randomized, but there can be biases of various kind (answers given mostly by people fostering changes or, conversely, mostly by people afraid of changes). On first approximation we can consider the various possibilities mutually excluding thus avoiding a selection bias.

The second possible source of misinterpretation lies in the fact that the questionnaire has been developed according to European standards, in which Pediatrics is by definition a postgraduate specialization, hence a "student in Pediatrics" is actually a postgraduate resident in Pediatrics. In CA system, where Pediatric Medical Faculty is one of the different types of Medical Faculties, the term "pediatrics student" can be applied also to undergraduate and not only to postgraduate students. All possible care has nevertheless been taken to separate undergraduate from postgraduate students.

Distribution of responders according to their status (Government official, Faculty member, professional, postgraduate student, undergraduate student) is presented in tab. 1.

Table 1. Questionnaires distribution according to status of the respondents

Respondents' status	Respondents' number	%
Department of Education	9	6,7
Department of Health	7	5,2
Professional Association	4	3,0
University Teaching Staff - Pediatric Neurology	11	8,1
University Teaching Staff - Pediatric Surgery	9	6,7
University Teaching Staff - Pediatrics	37	27,4
pediatric surgeon	2	1,5
pediatrician	5	3,7
Undergraduate student	30	22,2
Postgraduate student	21	15,6
TOTAL	*135*	*100,0*

Considering respondents' status distribution, it has to be noticed the strong participation of University teachers (42,2%, adding up all three specialties), followed by postgraduate (22,2%) and undergraduate students (15,6%).

The introductory part of the questionnaire was aimed to evaluate the shared knowledge of some details about the training system in Uzbekistan.

As far as the length of the undergraduate course in pediatrics (undergraduate training) is concerned, the majority of respondents (74,8%) indicated 6 years. In detail answers given were: 7 years (3 respondents), 6 years (101), 5 years (2); 4 years (2); 3 years (4); 2 years (4), 1 year (1).

About the same question on length of postgraduate training, 83 respondents (61,4%) indicated 3 years, while 48 (35,5%) indicated 2 years (the 4 remainder from 1 to 5 years). Ignoring possible input mistakes, this result shows that there is

some confusion in the perception of the actual curricula among the different stakeholders.

The question related to the perception of each respondent regarding the number of hours of teaching involved in the course of pediatrics gave as well a wide array of answers, reported in fig. 2, showing than the estimated number of hours devoted to the teaching in pediatrics is rather low, being considered from 150 to 250 hours per year by half of the respondents.

Also this result depicts a wide variety of situations, possibly related to different organizational schemes among different HEI, or again a different perception among they various stakeholders; both cases anyway describe a lack of a clearly defined curriculum of pediatric studies.
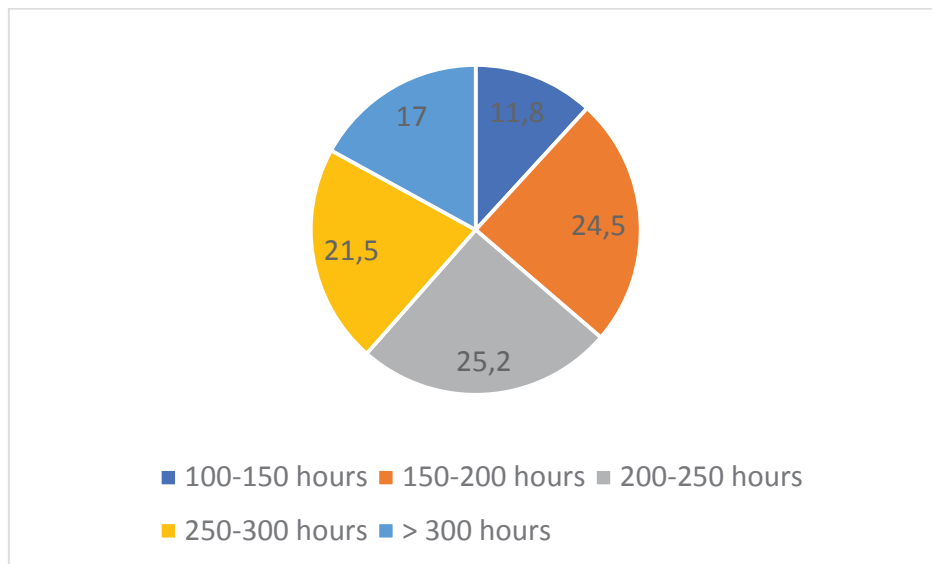
Figure 2. Percentage of respondents estimating of the number of hours of teaching per year in the course of pediatrics

According to undergraduate and postgraduate students, practical training at the bedside involves the percentages of the total training time graphically presented in fig. 3.
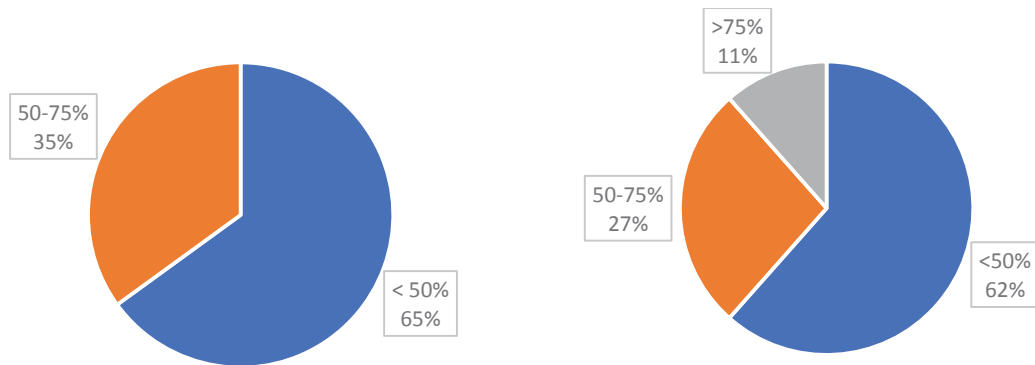
Figure 3. Percentage of the total training time spent at the bedside according to undergraduate (left) and postgraduate (right) students

Interestingly, according to University teachers this distribution is perceived in a very different way (fig. 4):
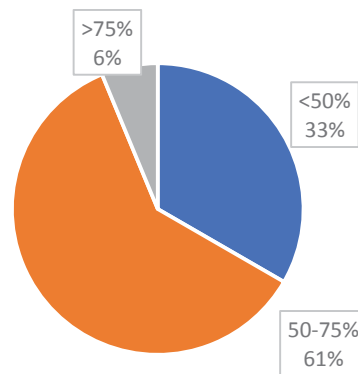
Figure 4. Percentage of the total training time spent at the bedside according to University teachers

Going more in detail about bedside training, the questionnaire asked the number of students entrusted to each tutor during the bedside training. Values, expressed as a percentage of answers for each one of the possible choices, are as follows (fig. 5):
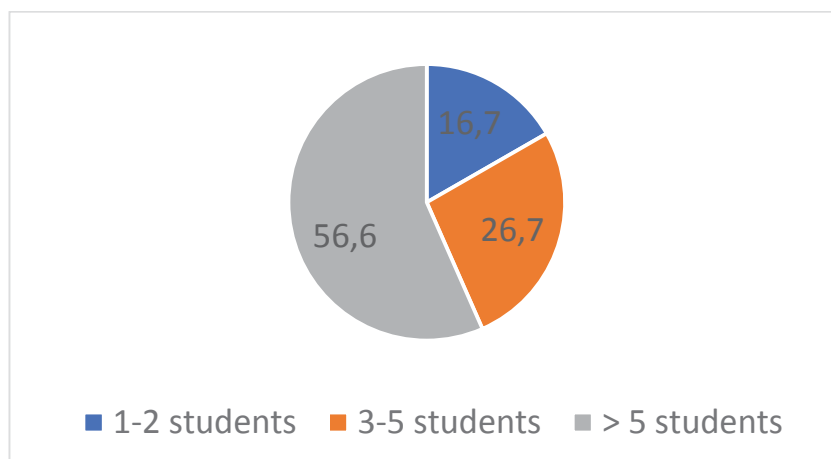
Figure 5. Percentage of respondents estimating of the number of students entrusted to each tutor during the bedside training

To give a rough indication on the overall size of the teaching staff, respondents were then asked to give the total number of medical teachers involved in the students' training. Fig. 6 presents the result, showing that a teaching staff of > 10 members – the standard in European countries – is estimated as available only by the 13,4% of respondents.
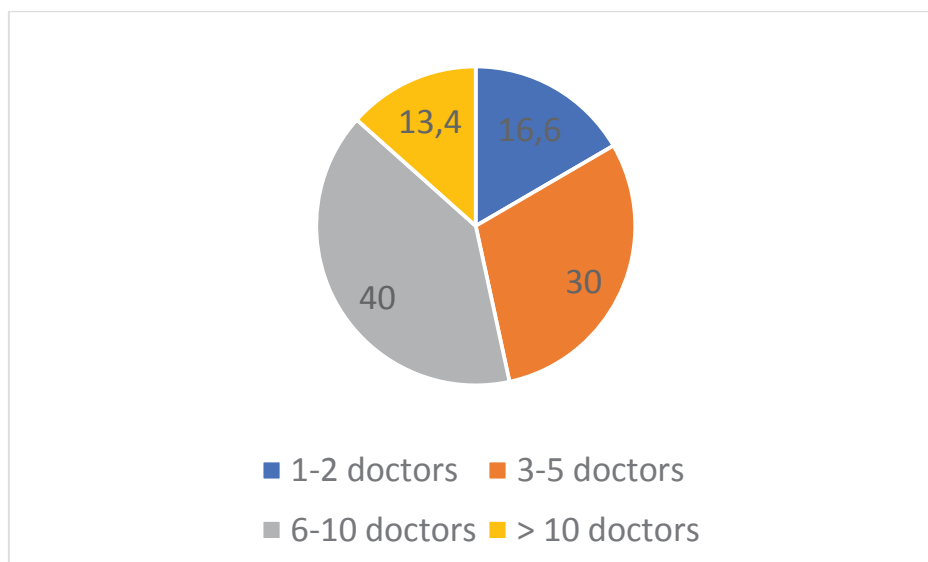
Figure 6. Percentage of respondents estimating of the total number of medical teachers involved in students' training

While asked if, according to their knowledge, there was any obligatory list of procedures to learn during practical training, respondents answered as follows (fig. 7):
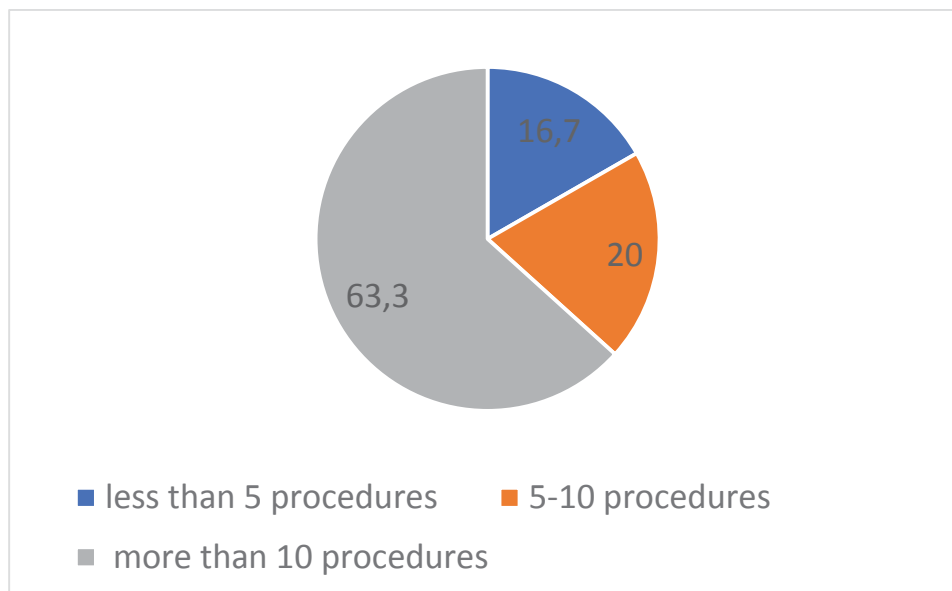
Figure 7. Percentage of respondents estimating of the total number of obligatory list of procedures to learn during practical training

Strengths

To evaluate the strengths in the medical training system today adopted in Uzbekistan, respondents were requested to indicate what considered as particularly effective, classified on a numeric scale (1 = not effective at all; 10 = very effective), chosen through a list of proposed items, followed by some "open" answers.

STRENGHTS	Evaluation
1) The combination of theoretical and practical training	7
2) Organization of courses	7,1
3) Involving students in hospital practice	6,8
4) curriculum content	6,9
5) The integration of pediatric surgery in the general surgical practice	6,4
6) The integration of childhood neuropsychiatry in the general pediatric practice	6,4

Organization of courses seems to have the higher evaluation, while integration of subspecialties in the general core pediatric teaching seems not to collect respondents' favor. Some underlying criticalities, such as corruption and basic professional training, emerge continuously also while detailing strengths of the system.

Among other points of particular strength deemed worthy of a mention is quoted the *"strict discipline"* and the *"program versatility"*. As a wish for the future, the pleas for a *"Support for reforms in medical education by the Government... Flexibility in changing curricula and programs... Increase the hours of practical training... teaching of minimally invasive diagnostic methods... new learning methods... advice and introduction of foreign experts"*.

Weaknesses

Also in this case respondents were requested to classify the most critical problems in the medical training system today adopted in Uzbekistan in a 1 to 10 scale (1 = not relevant 10 = very much relevant), selected from a list of proposed items followed by "open" answers.

WEAKNESSES	Evaluation
1) The separation of pediatric training from general medical training	5,8
2) The lack of proper postgraduate training in pediatric subspecialties	6,2
3) An excessively theoretical content of curriculum	6,2
4) The lack of simulation-based training	6,8
5) The lack of interaction with medical schools abroad	6,6
6) The lack of training in interaction among colleagues	6,5
7) The lack of training in international medical literature consultation	6,8
8) Lack of training in the diagnostic centers for newborns	6,2
9) Lack of student involvement in pediatric studies	6,1
10) The lack of access to evidence-based medicine	6,6
11) The lack of foreign languages knowledge	6,6

The separation of pediatric training from general medical training seems to be the least critical weakness (5,8/10), while the more critical is considered the lack of simulation-based training and the lack of training in international medical literature consultation (6,8/10).

"Open" answers given by University teachers in pediatrics, in addition to quote little literature and textbooks, recalled the lack of psychological testing or interviews on adherence to the profession upon admission to a medical university and how "*most of the faculty thinks the old way and is not ready to accept new methods of learning*".

It is noticeable the fact that one of the most critical features of the CA training system to European eyes, the separation of pediatric training from general medical training, is considered the least relevant weakness by all respondents.

Among the most critical features of the Uzbek medical training system and the possible changes to be made, what emphasized by more than one third of respondents – both teachers and students - is the lack of practical training vs an excessive theoretical content *("Enlarge practice… A lot of theory, I want more practice… Increase hours near patient bed…Little practice… Reduce theoretical hours for students…   The introduction of practice at the bedside…   A lot of theory"*). The second most critical feature, for 19% of the respondents, is the testing system *("Remove Tests and allow students to express their opinion… for example, a student skipping heavy studies and learning tests answers in one day, the day after the test does not remember anything about the subject and has zero in practice... Tests should not be the main evaluation criteria in medicine"*).

According to University teachers, what is needed is "*evidence-based medicine training, cancel short-term specialization courses, introduce a 4-year residency in therapy, surgery, pediatrics*" and "*Mandatory class attendance*". It is also suggested to improve access to foreign literature, to add medical English in the curriculum, to improve financing of the system, to implement protocols and standards, to have "*fewer students per teacher, for example 2-3 students*". Department of Education suggested for students: "*Strengthening of learning practical skills, the introduction of certification for the right to treat (in addition to the state exam)*".

About weaknesses interfering with a successful implementation of the medical education system were quoted "*Poor bedside practice… little practice, few training facilities*" specified in detail as: "*Not enough university clinics, respectively limited access to patients. The existing ratio of students to teacher is a large number of students in a students' group, plus a poorly developed material and technical base*".."*Lack of foreign literature, evidence-based medicine*" … "*Lack of electronic document management in a medical institution*".

For University teachers the testing system is the more controversial: "*Crammed tests… Testing for students is not an element of knowledge assessment… Tests interfere with an objective assessment of the student*". Bureaucracy is seen as the main criticality in the system, with many respondents asking for a change in the laws and regulations as well as for a support from

Government authorities. Inadequate funding is denounced as a problem, and the fact that *"Education costs too much";* a professional association respondent duly emphasized the need of a higher payments for trainers.

The observation on the reduced if not totally absent foreign experience with other educational systems could explain the reluctance to accept changes in the actual system, considered as the best possible not having any basis for comparison.

Opportunities

About opportunities that ChildCA project could bring to the Uzbek medical education system are a structural expansion of horizons in the field of international cooperation (49% of the respondents), improving the program of Continuous Medical Education in the field of pediatrics (35%), change in the actual organization of training programs (16%). In particular, among the proposed changes in the organization of training programs are quoted: increase the number of years of education, improving programs through the experience of foreign colleagues and harmonization with international pediatric training standards, introduce a credit transfer system in the learning process and medical English, introduction of new technologies in the learning process, with reduced hours of theoretical and lecture classes, more practice and self-education.

The question on how respondents could take advantage of the opportunities of using the experience of European Countries stimulated some interesting answers, such as: *"Study the education system, make appropriate changes to curricula and teaching methods. Learn modular experience of learning... integration of medical English into the educational process"..."Improvement of advisory skills of future specialists, general skills with patients based on modern requirements for specialists... Theoretical courses and practical skills... Continuing education course on minimally invasive technologies... Improving consultative skills of future specialists, communication skills with patients based on modern requirements for specialists"..."Learning all the innovations in pediatrics and integrate it into our healthcare system... Experience, guides, access to articles... online learning... Government organized programs for free examination of children".*

From this partnership with Europe, respondents expected broadening horizons through experience exchanges and internships abroad, attracting professors for conducting master classes in order to complete transition to a medical education system in accordance with European standards, improving and expanding scientific and practical knowledge including comprehensive application of minimally invasive technologies and introducing English in the teaching programs.

Threats

While requested to quote some possible risks in the collaboration between Uzbek and European HEI, the majority of respondents (61%) did not feared any risk, while the remainder quoted: lack of support from Government and Ministries, the risk of brain drain, the fears that differences in the education systems will not allow to change some standards, and a final observation that *"the formation of future specialists as "experimental rabbits" with a not properly adapted training system could be followed by a decrease in the quality of the specialist"*. Among quoted risks were modifications in the planned course of study, forcing the introduction of changes, and specifically *"Making decisions without taking into account the characteristics of existing education, mentality, socio-economic and natural conditions of the country"* (actually the fear that the exercise of the questionnaire would try to avoid).

Among other threats feared in the process of updating medical curricula were indicated the ignorance of innovative (or just foreign) language, or the risk of involving in the project people with a short work experience with students (specialists, cadets, etc.). Local education system and difficulties in changing it are quoted as well; a postgraduate student denounced: *"Corruption, old teachers and doctors do not allow young people to surpass them and take their places in the hospital and in the departments"*.

Discussion

The fundamental purpose of Erasmus+ CBHE projects, helping HEIs of partner Countries to develop new modern curricula compatible with European standards [6], is certainly commendable. Nevertheless, it presents the risk of an "excess of zeal" in aiming to change - cost what may - a situation that may have existed for a long time, without first having thoroughly studied the characteristics and cultural background that had motivated and guided its development. Such an attitude, in addition to being a sign of a certain degree of cultural arrogance, is completely counterproductive because the new curricula introduced in this way - perhaps forcibly and on the wave of misdirected enthusiasm - run the well-founded risk of being abandoned in a short time, for a return to an outdated but reassuring past [1].It is therefore necessary to approach the conception and implementation of a CBHE project with great openness and respect for the cultural background of the partner Countries, trying as much as possible to understand its most relevant aspects before the formulation of new proposals.

The ChildCA project was conceived and developed keeping this attention in mind and in the foreground: from this point of view, it seemed to us that the tool offered by the questionnaire could adequately respond to the need to know in depth

the situation and aspirations of all partner institutions' stakeholders, before starting the work of renewing and modernizing study curricula.

By evaluating ex post the work done, we think now justified to say that the goal has been achieved. The number of responses obtained, over 600, is well sizeable, also taking into account the fact of having worked in situations not particularly familiar with this kind of activity. The reliability of the answers, also favored by the strict respect for the respondents' anonymity, is guaranteed by the rude sincerity of many of these, of which some examples are given in this work.

The analysis of the responses collected in the questionnaire made it possible to draw up a project baseline document, published on the project website [4], on the basis of which were subsequently processed the new curricula jointly drafted with the partner institutions, now in the process of being approved by the competent Government authorities. The considerations and suggestions proposed by the respondents often take on a value that goes beyond the particular contingency linked to the paediatric context of the questionnaire: for this reason, we propose them to other similar projects wishing to freely draw some suggestions or operational proposals. In this way we will be able to confirm the achievement of one of ChildCA project goals, the ambition of acting *as a template for upgrading medical education in Central Asia*.

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ESTABLISHMENT OF TRAINING AND RESEARCH CENTRES AND COURSES DEVELOPMENT ON INTELLIGENT BIGDATA ANALYSIS IN CENTRAL ASIA

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Abstract: Implementation and further sustainability of Erasmus+ CBHE joint project "Establishment of training and research centres and courses development on Intelligent Big Data Analysis in CA" ELBA of EU Erasmus+ program is considered in this paper. The project is focused on improving the academic capacity of professionals through developing and implementing a multidisciplinary package of module-based courses for bachelor, master students, and professionals of engineering on Intelligent Big Data Analysis (IBDA) in Central Asia countries via collaboration with the industry. Work Package 3 plays one of the key roles in the delivery of a particular specific objective of the project on developing package of IBDA courses. Authors, in particular, consider performing four tasks proposed by the project to development of that IBDA courses' package: elaboration of programs of the needed courses on IBDA; development of the module-based courses on IBDA; testing developed IDBA courses through its pilot implementation; revision and confirmation of the courses on IBDA. Sustainability of the project is considered as well.

Keywords: capacity building in higher education, course development, course pilot testing, research centres, Intelligent BigData Analysis, artificial intelligence.

СОЗДАНИЕ УЧЕБНО-ИССЛЕДОВАТЕЛЬСКИХ ЦЕНТРОВ И РАЗРАБОТКА КУРСОВ ПО ИНТЕЛЛЕКТУАЛЬНОМУ АНАЛИЗУ БОЛЬШИХ ДАННЫХ В ЦЕНТРАЛЬНОЙ АЗИИ

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Аннотация: В статье рассматривается реализация и дальнейшая устойчивость совместного проекта CBHE «Создание учебных и исследовательских центров и разработка курсов по интеллектуальному анализу больших данных в ЦА» ELBA программы ЕС Erasmus+. Проект направлен на повышение академического потенциала специалистов путем разработки и внедрения междисциплинарного пакета модульных курсов для бакалавров, магистрантов и инженеров по интеллектуальному анализу

больших данных (IBDA) в странах Центральной Азии посредством сотрудничества с промышленностью. Рабочий пакет 3 играет одну из ключевых ролей в достижении конкретной цели проекта по разработке пакета курсов IBDA. Авторы, в частности, рассматривают выполнение четырех задач, предложенных проектом по разработке данного пакета курсов IBDA: разработка программ необходимых курсов по IBDA; разработка модульных курсов по IBDA; тестирование разработанных курсов IDBA путем их пилотного внедрения; пересмотр и подтверждение курсов на IBDA. Также рассматривается устойчивость проекта.

Ключевые слова: наращивание потенциала высшего образования, разработка курса, пилотное тестирование курса, исследовательские центры, интеллектуальный анализ больших данных, искусственный интеллект.

Introduction

The innovative development and modernization of the economy is the main trend for all developed and developing countries. Central Asian countries according to the Global Innovation Index (GII) rank in the second half of the table including 126 countries. Kazakhstan with the highest index ranks 74th position there. The problems caused this result lie, among other things, in Low Innovation Linkages (GII is 16.9%), including University/Industry research collaborations (GII is 39.1%), Knowledge Impact (GII is 17.3%), ICT services import/export (GII is 7.0/0.3%). These problems are similar for all Partner Countries and require significant measures [1].

One of the main innovative directions of economic development is the concept of the digital economy which is widely implemented now. The digital economy relies on huge amounts of information, which require brand new technologies for its processing. These technologies are based on modern Intelligent Big Data Analysis (IBDA) systems with the use of Artificial Intelligence methods. In many ways, the effectiveness of such technologies is due to the automation of routine work in the analysis of large data sets, contributing to greater production efficiency in the industry.

However, the introduction of such technologies in the countries of Central Asia is limited by the lack of qualified specialists in this field. This applies fully to both specialists working with IBDA technologies, as well as researchers and developers in this field. However, IBDA was not included either into bachelor or master programs in CA HEIs preparing economy specialists.

Another problem of CA HE lies within the insufficiently flexible response of HEIs to the changing needs of the industry and insufficient collaboration with them. In the bachelor and master curricula of the CA HEIs, there is a lack of

training for industry specialists in innovative areas of the economy, particularly, in IBDA.

Also, the problem that restricts the implementation of high-efficiency technologies such as IBDA to CA economies and HE system is the poor awareness of society at large which results in the lack of their funding.

Addressing those problems in CA, HEIs have been granted by the amount of about 1 million Euros from CBHE action of EU Erasmus+ program to develop and implement in the frame of the joint regional project ELBA modern EU standardized curriculums and module-based training courses on IBDA to bachelor and master programs, to conduct trainings for specialists of industry, to establish IBDA Research&Training Centres and the network of IBDA specialists in CA partner countries.

A consortium of the project consists of 3 EU universities (University of Santiago de Compostella, Spain; Politecnico di Torino, Italy, and the University of Primorska), 10 CA universities (Turin Polytechnic University in Tashkent, Bukhara engineering-technological institute, Urgench State University, Tashkent State Transportation University, Uzbekistan; International Information technology University, A.Baitursynov Kostanay State University, Kazakhstan; Technological University of Tajikistan, Kulob Institute of Technology and Innovation Management, Tajikistan; Kyrgyz State Technical University, Osh Technological University, Kyrgyz Republic) and 11 nonacademic partners from the industry and education.

Project implementation

Project aim, in general, is to improve the academic capacity of professionals through developing and implementing a multidisciplinary package of module-based courses for bachelor, master students and professionals of engineering on Intelligent Big Data Analysis (IBDA) in Central Asia countries via collaboration with the industry [2].

The project is aimed at creating opportunities for training of highly profiled specialists in the field of Intelligent Big Data Analysis (IBDA) with different multidisciplinary backgrounds and enabling access to highly efficient modern IBDA instrumentation based on EU expertise and technologies which will contribute to the sustainable development of educational institutions, local business enterprises and society at large.

The first specific objective is to develop a multidisciplinary package of module-based courses on IBDA for bachelor and master programs of the partner HEIs and for industry companies in CA by 2021 addressed problem of the lack of qualified specialists in innovative fields, specifically on IBDA, of CA partner countries' economies. Support to solve this problem should be provided by the partner HEIs as a result of the implementation of developed courses on IBDA in

curricula of current bachelor and master programs. The package courses being developed should contribute to the modernization of existing curricula by introducing new, innovative subjects to the IBDA. These courses help to more flexibly meet the needs of the economy for qualified specialists and strengthen collaboration between HEIs and industry.

The second specific objective is to establish IBDA Centres and academic and professional network of IBDA specialists of CA partner HEIs by 2020 addressed problem of insufficient awareness of public society and make decision-making authorities on innovative technologies, or more specifically, on IBDA. This network promotes both more effective cooperation between the consortium partners, and, after its expansion, further cooperation between Central Asia specialists in Big Data Analysis.

The target groups of the project at the regional level include teaching staff of the partner universities, students of different educational programs, local enterprises, private companies, and the specialists employed by them. The first specific objective of the project on developing a multidisciplinary package of module-based courses on IBDA for bachelor and master programs in 10 partner universities and for industry companies in CA addresses the needs of the academic staff of partner HEIs in training from EU experts on developing module-based courses in IBDA, subject-oriented English and skills on corresponding software, expansion of academic and research collaboration with the EU and CA universities.

Activities relating to that objective include staff capacity building in EU partner universities, 2-weeks of training on IBDA there, and 1-week retraining in partner HEIs by EU experts. Also, staff trainings on technical English by local teachers were planned in each partner HEIs. The project involves close cooperation between CA and EU experts, based on the experience of the EU, which will be continued after the completion of the project, and will also contribute to the sustainability of the project.

Needs of the students enrolled in different educational programs in partner universities on enhancing their experience at the international level, with their introduction to the latest developments in the field of information and communication technologies and other related fields are supported by the first specific objective as well. During the project students of partner HEIs participate in testing developed new modern courses on IBDA and they are taught those courses during regular programs on bachelor and master levels. Their international experience enhances by studying IBDA courses of the EU standards and quality.

Needs of specialists employed by the local enterprises, private companies in keeping their skills and competencies up to date, improving their professional skills in IBDA, and needs of those companies for qualified specialists to support more product effectiveness using IBDA will be supported by the first specific objective

that supposes implementing newly developed courses on IBDA for the advanced training industry specialists. Those courses will be developed taking into account their application in the industry.

Project target groups in Partner Countries are varied in the fields of industry enterprises where project results will be implemented. Analysis of the relation between project-specific objectives and needs of that target group in each country is similar to the one done above. Therefore, we will present only the specific fields of the target groups of industry specialists who benefitted from the project.

Project results

The tangible results which are expected to be achieved at the end of the project is presented in Table 1.

Table 1. Results of the project on capacity building

Results	Uzbekistan	Kazakhstan	Tajikistan	Kyrgyz Republic
Number of academic staff participating in trainings	up to76	up to 38	up to 38	up to 38
Number of trainees (students, professionals)	up to 200	up to 100	up to 100	up to 100
Number of agreements of mutual cooperation between Central Asia partners and industry	up to 5	up to 3	up to 3	up to 3

Development of IBDA courses

There are four tasks proposed by the project to perform the development of the module-based multidisciplinary IBDA courses package in a frame of the WP3:

3.1 Elaboration of programs of the needed courses on IBDA

3.2 Development of the module-based courses on IBDA

3.3 Testing developed IDBA courses through its pilot implementation

3.4 Revision and confirmation of the courses on IBDA

Task 3.1 has been completed by POLITO ("ELBA - version 03 / wp 3 / task 3.1 - Elaboration of programs for the needed courses on IBDA - March 2021"), and CA partners got proposal with the current courses and programs on IBDA operated at EU partner universities.

According to the project plan, these tasks should be completed by August 2021 after trainings of courses' developers in EU partner universities. But due to the pandemic of COVID-19 planned trainings in the EU were postponed. To support the developing of IBDA courses 3-day online training on IBDA for CA partners' staff was delivered by EU partners in November 2020. A list of the proposed courses on IBDA from EU partners was presented in March 2021 [3].

WP3 plays one of the key roles in the delivery of a particular specific objective of the project, which is "To develop a multidisciplinary package of module-based courses on IBDA for bachelor and master programs, trainings in 10 universities and industry companies in CA". Accordingly, the activities of this WP are focused on the comprehensive development of a multidisciplinary package of module-based IBDA courses.

First and foremost, POLITO and UP were responsible for the elaboration of the needed courses on IBDA. EU partners delivered proposals for courses developed during WP3/Task 3.1 by POLITO.

Following, CA partner HEIs collectively have developed the package of module-based courses on IBDA using and updating courses proposed by EU partners. In order to improve and ensure the quality of the package, benchmarking was performed through the pilot implementation of the package. After benchmarking, the package content has been revised. Overall, the above-mentioned procedures were observed by EU partner HEIs for the provision of quality of the package.

Implementation of the project in all partners was performed mostly according to general roadmap developed jointly. As sample, let's consider case of IITU.

The International University of Information Technologies had the following main tasks:

1. Trainings CA academic staff in EU on IBDA methodologies and skills on corresponding software
2. Retraining CA academic staff on IBDA by EU experts in CA partner HEIs
3. Development of the module-based courses on IBDA
4. Testing developed IDBA courses through its pilot implementation
5. Revision and confirmation of the courses on IBDA
6. Elaboration of programs for the needed courses on IBDA

The results of training at the trainings allowed teachers to revise the disciplines existing at the university on data analysis. The project team systematized all the Data Analysis disciplines that were taught at IITU, modernized the disciplines corresponding to the modern market, combining and improving the existing disciplines.

Thus, as a result of the project, 11 disciplines with a volume of 59 credits in undergraduate educational programs, 5 disciplines with a volume of 24 credits in

master's educational programs, 4 disciplines with a volume of 16 credits in doctoral programs were modernized. These results are presented in Table 2.

Table 2. Modernized courses at IITU - bachelor's degree

Course Name	Lecturer	# of credits	Semester #	# of students	updated %
Intelligent Data Analysis	Sarsembayev A.	6	7	80	54
Machine Learning - 1	Sarsembayev A.	6	5	21	46
Machine Learning - 2	Sarsembayev A.	6	6	21	60
NoSQL Databases	Dauletbek Ye.	6	7	128	70
Data Science: Introduction to machine learning	Marat G.S.	4	7	14	30
Python for Data Analytics	Zhanabekov Zh.	5	5	58	45
Data Science Advanced	Zhanabekov Zh.	3	8	19	40
Neural Networks and their Applications	Marat G.S.	6	7	19	30
Parallel programming	Naizabayeva L.	5	6	18	50
Data Analytics	Sembina G.	5	6	40	60
Data and Information management	Naizabayeva L.	7	6	120	40
	Summary	**59**	**-**	**538**	**47,73**

Table 3. Modernized courses at IITU - master's degree

Dept	Course Name	Lecturer	# of credits	Semester #	# of students	updated %
MCM	Python/R for data analysis	Altaibek A.A.	5	1	24	80
	The problem of retraining neural networks, data augmentation	Marat Nurtas	5	3	17	40
	Machine Learning 2	Marat Nurtas	5	2	24	30
IS	Analysis and processing of unstructured data	Kuatbayeva A.	4	3	40	60
	Machine learning methods	Pashenko G.	5	3	80	60
		Summary	**24**	**-**	**185**	**54,00**

Table 4. Modernized courses at IITU - PhD courses

Dept	Course Name	Lecturer	# of credits	Semester #	# of students	updated %
MCM	Advanced Deep Learning Problems	Marat Nurtas	4	1	5	60
IS	Deep learning methods	Kuatbayeva A.	4	1	2	50
	Intelligent system in IS	Sembina G.	4	1	2	60
	Big data processing	Naizabayeva L.	4	1	2	50
		Summary	**16**	**-**	**11**	**55,00**

The project allowed the development of new courses in the field of Data Analysis. As a result of the work of the team, 5 new disciplines were developed for bachelor students.

Table 5. BS courses / newly created

Dept	Course Name	Lecturer	# of credits	Semester #	# of students
CE	Audio and Text Processing (Santiago materials)	Sarsembayev A.	6	6	21
	Big data processing (Santiago materials)	Chinibayeva T.	6	7	21
	Introduction to computer vision	Sarsembayev A.	6	6	20
MCM	Machine Learning	Alimbekov A.Ye	6	7	41
	Python for Data Analysis	Tokmukhamedova F.K.	4	7	22
IS	Systems analysis and design	Rakhmetulayeva S.	5	7	40
		Summary	**33**	**-**	**165**

The largest number of new disciplines has been developed for students of master's programs. Based on the results of the project at the IT University, teachers developed new disciplines for students of the specialties "Information Systems", "Mathematical and Computer Modeling", "Cybersecurity". Absolutely new disciplines in demand in the modern labor market are Computer Vision, Machine Learning and Computer Statistics, Web Data Analysis, Internet of things and artificial intelligence, Numerical simulation using Python for DS and others.

Table 6. MS courses / newly created

Dept	Course Name	Lecturer	# of credits	Semester #	# of students
CE	Computer Vision	Sarsembayev A.	5	2	38
	Machine Learning and Computer Statistics	Abdul R.A.	5	1	45
	Web Data Analysis (Santiago materials)	Sarsembayev A.	5	3	38
	Internet of things and artificial intelligence	Duzbayev N.	5	3	38
MCM	Topological Data Analysis. (Torino materials)	Zhanabekov Zh.	5	3	17
	Machine learning methods in solving inverse problems	Rysbaiuly B.	5	3	17
	Numerical simulation using Python for DS	Marat Nurtas	5	1	24
	Applied Deep Learning	Marat Nurtas	5	3	17
	Advanced Data Analysis	Omarov B.	5	2	24
IS	Creative thinking modeling	Naizabayeva L.	5	1	53
		Summary	**50**	**-**	**311**

A survey was conducted among students about the level of complexity of mastering various courses. The results are presented in Figure1. They showed that the most difficult discipline for students to master was "Computer Vision".

3. Which portion of Data Science courses do you feel is the hardest to grasp for you?
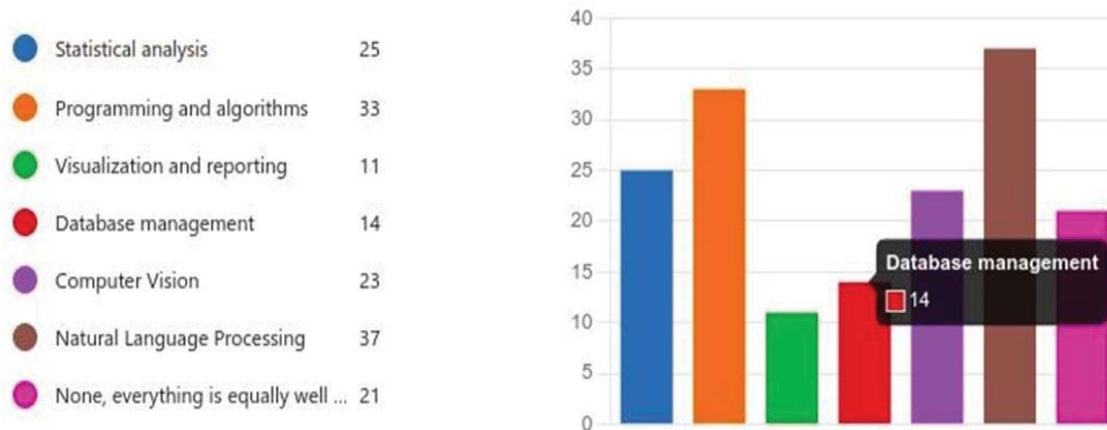
Дополнительные сведения

● Statistical analysis	25
● Programming and algorithms	33
● Visualization and reporting	11
● Database management	14
● Computer Vision	23
● Natural Language Processing	37
● None, everything is equally well ...	21

Figure 1. The ratio of the hardest Data Science courses to grasp according to the expectation survey.

There were next tangible results on capacity building:
- 3 team members attended Trainings CA academic staff in EU Training in Santiago de Compostela.
- The following 3 post-training seminars were attended: SQL / NoSQL (Naizabayeva), Containerization with Docker (Sarsembayev), Big data processing/Apache Hadoop (Dauletbek).
- 3 team members attended Trainings CA academic staff in EU Training in Torino. The following 3 post-training seminars were attended: Topological Data Analysis (Zhanabekov), Simplicial Homology (Rakhmetullayeva), Statistical Methods (Sembina).
- 2 team members attended Trainings CA academic staff in EU Training in Primorska. The following 2 post-training seminars were attended: Data visualization and feature engineering (Mishina), Introduction to Deep Learning (Tokmukhamedova).
- Retraining CA academic staff on IBDA by EU Retraining in Almaty: 63 people attended offline, 54 people attended online.

Summarizing partner's reports next conclusions about project WP3 results can be presented.
1. Five partner universities from Uzbekistan, Tajikistan, and Kyrgyzstan included IBDA topics in Bs and Ms programs. Over the project, they have upgraded currently operated courses with the topics from the developed IBDA package and courses. Five partners from Uzbekistan and Kyrgyzstan

have no before the project taught courses on IBDA. They implemented and developed IBDA courses for the Bs and Ms programs on IT and technical specialties. New courses are suggested mostly as elective courses. Besides, universities include IBDA topics in re-training programs for technical specialists as well.

2. New IBDA courses package is introduced mostly at 1st level of Bs and Ms programs to give further possibilities to students in improving their study and getting a better competitive qualification. IBDA package will be used in doctorate programs of all partners that will provide better project sustainability.

3. List of the courses or programs from EU partners' proposals that are the most interesting for the CA partners has been prepared. These courses fit with the studies of partner universities before the project, needs in developing new courses or upgrading operated IBDA courses on their responsibility and support.

4. CA partners provided a pilot implementation of the new or upgraded courses within their degrees on Bs and Ms programs. The pilot implementation is planned for the 2021-2022 and the 1st part of the 2022-2023 academic year.

5. The developed IBDA courses package consists of 10 courses. Development of the package was provided in wide collaboration between CA partner universities with the advising support of EU partners. CA partner HEI development teams used the suggestions and recommendations of EU partners. The package is adapted to the realities of CA countries. Each CA partner university responded in the development of at least one course package and participated as a supporter in the development of 2-3 courses collaborating with other responded universities.

6. Two universities from Kyrgyzstan opened new paths related to Intelligent Big Data Analysis. Kyrgyz State Technical University opened the "Big Data Analysis and Processing" path in 2021 and admitted 20 students for 2021-2022 and 55 students for the 2022-2023 academic years (2.5 times increase on the second year).

OshTU opened the "Applied Informatics in Big Data Analytics" path in 2021 and admitted 21 students for 2021-2022 and 14 students for the 2022-2023 academic years.

Sustainability of the project

The project sustainability depends on the dissemination activities as much as on successful implementation at CA partner HEIs. Carefully designed dissemination roadmap and activities carried out at the CA partner HEIs ensure an increasing number of IBDA Centre users and the high demand for highly skilled

graduates year after year. The IBDA Centres' activities, video lectures, trainings, and professional and academic networks support the sustainability of the project results. Associated project partners actively take part in dissemination processes.

During the project each CA partner sign agreements with labor market partners, to secure the sustainability of academic-entrepreneurial cooperation and expert consultation. Stakeholders of CA partner countries have been involved in signing agreements/contracts for performing research and student internship activities.

Project is currently continued, and this paper was devoted mostly on an academic results of the project. However, the project has achieved many other important results, which will undoubtedly contribute to the sustainability of the project in the future. Thus, within the framework of the second main goal of the project, centres were created and put into use in all the universities of the CA for training students of undergraduate and graduate programs, preparing PhD, conducting research in the field of IBDA.

Within the framework of the project, a network of IBDA specialists was created and is successfully developing, a knowledge base portal for IBDA has been developed and is operating. Also, as part of the further dissemination of the project, a competition of IBDA developments is organized, in which groups of students of CA partners take part under the guidance of university professors. A joint memorandum is being developed with the participation of all project partners for further cooperation in the training, use and research in the field of IBDA. Similar agreements are also created between partners and industry enterprises. All this will contribute to the further development of innovative technologies in the CA countries.

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CULTURAL HERITAGE ASSETS IN CENTRAL ASIA – INTERDISCIPLINARY APPROACH TO THE COMPLEX PROBLEM OF ENVIRONMENTAL RISK ASSESSMENT

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Abstract: Uzbekistan owns more than 7,500 Cultural Heritage (CH) assets and the Republic of Tajikistan has registered a total of 2020 historical and cultural monuments including more than 300 architectural and more than 1000 archaeological sites. Several CH assets have been destroyed from constant negative influence of natural and man-made hazards. The governments have made considerable efforts to comply with its obligations under the UNESCO 1972 Convention. Both territories have a number of concepts for the preservation of architectural heritage. Whereas there is a lack of qualified engineers as well as review and consideration of international developments as well as international practice adoptable to Central Asia CH. This paper presents the findings of the partner's investigations as well as the concept and objectives for the development of a master's course in Cultural Heritage Conservation in Central Asia within Erasmus+CBHE project with focus on environmental risk assessment and mitigation (hydrogeology, climate changes, seismic action, etc.) on structures and natural places, documentation and monitoring strategies of structures and landscapes, restoration and conservation strategies and others.

Key words: Cultural Heritage, Central Asia, Erasmus+ Capacity Building, Higher Education, Preservation, Environmental Risk, Master's Course.

ОБЪЕКТЫ КУЛЬТУРНОГО НАСЛЕДИЯ В ЦЕНТРАЛЬНОЙ АЗИИ – МЕЖДИСЦИПЛИНАРНЫЙ ПОДХОД К КОМПЛЕКСНОЙ ПРОБЛЕМЕ ОЦЕНКИ ЭКОЛОГИЧЕСКОГО РИСКА

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Аннотация: Узбекистану принадлежит более 7500 объектов культурного наследия (КН), а в Республике Таджикистан зарегистрировано в общей сложности 2020 памятников истории и культуры, в том числе более 300 архитектурных и более 1000 археологических памятников. Несколько

объектов КН разрушены от постоянного негативного воздействия природных и техногенных опасностей. Правительства предприняли значительные усилия для выполнения своих обязательств по Конвенции ЮНЕСКО 1972 года. Обе территории имеют ряд концепций по сохранению архитектурного наследия. Целесообразно принять во внимание нехватку квалифицированных инженеров,обзор и рассмотрение международных разработок, а также международной практики, применимой к КН Центральной Азии. В этой статье представлены результаты партнерских исследований, а также концепция и цели разработки магистерского курса по сохранению культурного наследия в Центральной Азии в рамках проекта Erasmus+CBHE с упором на оценку и смягчение экологических рисков (гидрогеология, изменение климата, сейсмические действия и др.) по сооружениям и природным местам, документация и стратегии мониторинга сооружений и ландшафтов, стратегии реставрации и сохранения и другим.

Ключевые слова: Культурное наследие, Центральная Азия, наращивание потенциала Erasmus+, высшее образование, сохранение, экологический риск, магистерская программа.

Project Erasmus+ ERAMCA

The Erasmus+ ERAMCA project [3–5] aims to integrate the knowledge of environmental and civil engineers, and architects in an interdisciplinary process aimed at providing practical solutions to complex problems related to management of environmental risks on cultural heritage in compliance with international policies related to conservation and restoration promoted by UNESCO [11] and from international charters on restoration promoted by ICOMOS. The wider ERAMCA objective is to build capacity in environmental risk assessment and mitigation on Cultural Heritage Assets in Central Asia by designing and developing an innovative educational platform based on new interdisciplinary courses, e-learning methods and digital tools to promote an effective conservation strategy of Cultural Heritage assets at different interest level.

The ERAMCA project aims to consider the environmental action on CH assets: climatic changes, hydrogeological phenomena, seismic phenomena and pollution. The correct knowledge and interpretation of these phenomena could help the simulation of the effects of foreseen environmental actions and therefore give significant information about the degradation of CH assets (buildings, historical centers, urban and natural landscapes, etc.) as well as a correct design of mitigation actions and a preventive design of possible intervention in case of catastrophic events (e.g. earthquakes, landslides, floods, etc.). CH in Central Asia is prone to those problematics therefore ERAMCA would like to give to the involved Countries (Uzbekistan and Tajikistan) effective solutions by acting and enhancing

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local potentialities represented by young generations of teachers and students and by inviting local stakeholders (mainly public authorities and agencies such as Local UNESCO offices and Ministries of Education and Culture) to give specific objectives to be reached. ERAMCA join three European universities where updated research and teaching activities are developed on environmental risk assessment and reduction on CH assets by using an interdisciplinary approach.

The main strategies of Cultural Heritage conservation were pointed out in a Decree of the Cabinet of Ministers of the Republic of Uzbekistan on "Preservation and Utilization of Culture Heritage Properties" (N: 265 in March 30, 2019) [8] and law of republic of Tajikistan on "Protection and Utilization of historical and cultural heritages" (N:377 in May 17, 2017) [7]. According to these documents, some of the main strategies are: strengthening the capacity of young teachers to develop conservation and restoration projects by using advanced technologies considering internationally accepted concepts of conservation; prepare electronic and cadastral documents for all CH assets using modern techniques; systematic monitoring of urban transformation of traditional urban fabrics of world heritage sites; assessing the condition of cultural heritage monuments which are not in heritage list of government and establishing the conservation and restoration schools.

Background

The historic cities of Uzbekistan and Tajikistan with their famous and traditional architectural ensembles, archaeological sites, and traditional urban fabric are considered as a unique world heritage property. The traditional urban fabric and monuments have suffered largely due to rapid urban transformation and environmental impacts. Most of the monuments are located within urban areas and are considered as an integral part of the urban fabric. The authenticity and integrity of historic urban fabrics are well preserved in Sughd, Khatlon, Gorno-Badakhshan Regions in Tajikistan. The same, Bukhara, Samarkand and Khiva are some of the most famous world heritage sites in Uzbekistan. Rapid development has damaged traditional elements of the historic urban fabric as well as traditional houses. These changes have been mainly caused by owners and local authorities looking for better comfort and quality of life without considering traditional urban fabric rules [2].

The traditional urban fabric is an essential part of the significance of the historic city. This means that the demolition of traditional housing areas should be avoided or limited, or faced with a different perspective; measures should be taken to encourage their sustainable development and rehabilitation. Another issue is that most of the traditional houses with high heritage value were not documented and consequently they were not included into the national protected heritage list. Some stakeholders did not know about the existence of these traditional houses since the existence of these cultural heritages were documented during the Soviet Union

period and they were on paper document format. Most of these documents have been unfortunately irretrievably lost.

In Uzbekistan and Tajikistan, the threats of physical loss of CH sites are associated with natural and anthropogenic wear processes caused by: adverse climatic conditions and structural instability of buildings; humidity and natural disasters; geological and hydrological motions and earthquakes; inappropriate intervention on buildings; fires, vandalism and other aggressive actions. One of the main deficiency is practically an absence of complete documentation of each CH asset (both of international or national interests) and an appropriate monitoring of their real conditions.

The main environmental issue, in almost all historical cities, is salt attack to foundations or underground facilities of historic and residential buildings. Salt attack is a result of high groundwater tables. The groundwater table is high in almost all historic urban areas and this is mainly due to mismanagement and inappropriate functioning of sewage and water supply systems. Due to these environmental impacts, the historic urban fabric has lost many of its traditional houses and monuments. Moreover, many historic buildings, including the residential ones, are seismically unsafe. Most people live in traditional houses and the local authorities do not have the necessary knowledge and expertise to restore and retrofit them. In the 1990s, Tashkent Research Institute of Restoration was abolished and subsequently the number of masters graduates and specialists have diminished.

Figure 1: Renovated Bibi-Khanym mosque [9]

The fundamental issues with the conservation of traditional architectural ensembles and unique monuments are inappropriate restoration and planning activities. Moreover, the seismic safety of these architectural ensembles and unique monuments has not been assessed. This is in part due to lack of the appropriate assessment models and strategy. The structural assessment of these unique architectural monuments is very important since they are at risk from several environmental hazards. As a result of changing climatic conditions, an increase in the mean precipitation rate and wind speed are forecasted. Archeologically excavated remains are also being destroyed because of precipitation, wind erosion and landslides.

It is noted that several restoration projects have been undertaken in the 1900s with mixed success. One of the more ambitious restoration projects was that of the Bibi-Khanym mosque which was one of the largest mosques in the Islamic world in the 15th century (Figure 1). Moreover, the renovation between 1991-1996 is believed to alter the original design concept since additional octagonal segments were placed on the meagre remains of the two framing towers (guldasta) and a band of inscriptions was added to the main sanctuary which elongated the overall proportions of the iwan and obstructed the view of the rebuilt turquoise dome [6]. The designed master's course will provide a forum for training and academic debate.

Concept and Objectives

ERAMCA is a joint effort between EU Higher Education Institutions (HEIs) and the Uzbekistan and Tajikistan HEIs, which aims to introduce an interdisciplinary approach into the teaching activities of local Universities with a voluntary acceptance of the EU policies and experiences in higher education systems. The focus will be on environmental risk assessment and mitigation (hydrogeology, climate changes, seismic action, etc.) on structures and natural places, documentation and monitoring strategies of structures and landscapes, restoration and conservation strategies and others. In particular, the following results were achieved in the project:
- Design of a Master in "Environmental Risk Assessment and Mitigation on Cultural Heritage Assets" following a multi-level approach in capacity building;
- Design and developing of teaching modules that follows the ERAMCA Strategic Education Agenda;
- Composition and harmonization of education and training packages and integration of existing curricula and material;
- Design a basic equipment for the laboratories which support the practical courses and the final project.

The objectives of the master's degree are set considering the different background and skills that Partner Countries experts have i.e. in the field of: geomatics, seismic engineering, hydrogeology, restoration and geotechnics. In addition, the general structure of the Master is defined considering the overall number of 120 ECTS, share of mandatory and elective ECTS. The overall pedagogical approach is set up with an outline of innovative learning schemes including e-learning, participate learning and learning by doing.

A general project overview is shown in Figure, where it is shown that the documentation of theoretical content and training of participants are the major milestones before the implementation of the master's program.
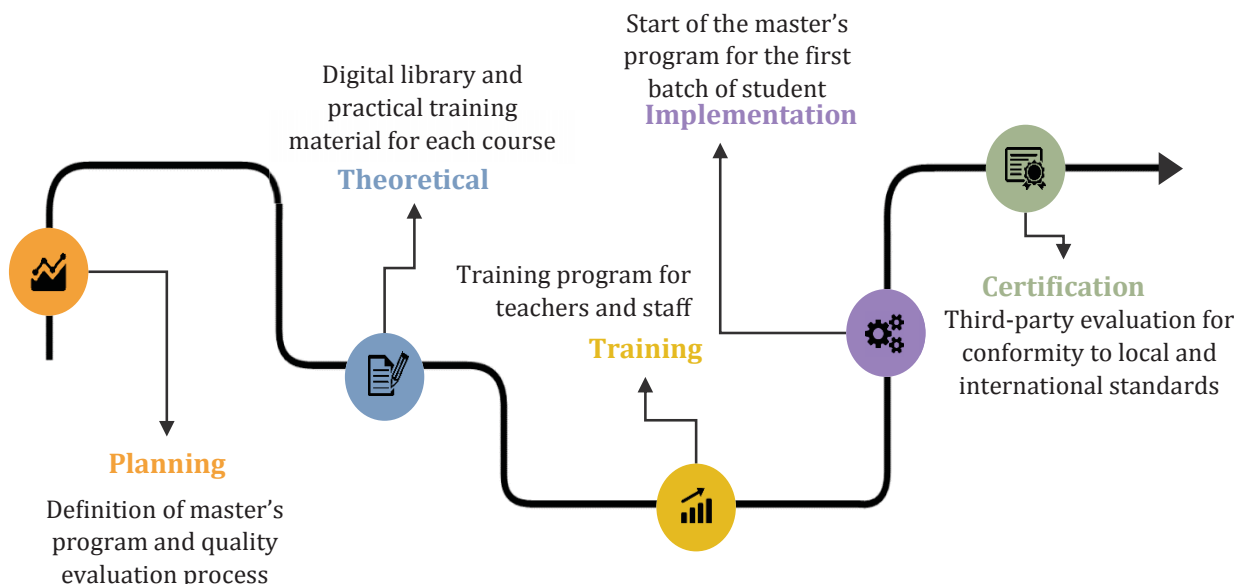

Figure 2. Overview of Project

The theoretical content is documented via online digital libraries with lecture notes and tutorial content for each course. The training program for the local teachers was conducted in the form of a workshop which facilitated the transfer of skills and content through collaboration to ensure that there is adequate preparation for the next phase of the project. From October 2022 the ERAMCA Master is activated in all the four Central Asia universities that participate the project.

Findings and Outcomes
Basic knowledge of potential students

A survey was conducted among members of the state examination commission on the degree of readiness of graduates over the last three years. They were evaluated on a five-point scale (1 - low level of development; 5 - high level of development) the level of mastering by graduates of professional competencies according to state educational standards of specialties. The basic knowledge of graduates in the specialty of Civil Engineering and Architecture of Khujand Polytechnic Institute of Tajik Technical University (KPITTU), Tajik Technical University (TTU), Turin Polytechnic University in Tashkent (TTPU) and Samarkand State Architectural and Civil Engineering Institute (SamSACII) were analyzed.

Another focus of the questionnaire was the definition of expected learning outcomes to the specialization in civil engineering and architecture.

By the type of professional activity in the direction of "Civil Engineering", the specific types of activity of the graduate are determined to be: 1) exploration and design activities; 2) production-technological and production-management activities; 3) experimental research. In the direction of "Architecture": 1) design activities; 2) research activities; 3) communication activities; 4) organizational and management activities; 5) critical and expert activities.

In an integrated form, the requirements for a modern engineer and architect for the results of his professional activity can be formulated as follows: the ability and readiness to creatively solve professional problems, the ability to navigate in non-standard conditions, possession of the system of necessary fundamental and special knowledge and practical skills necessary for the creation and implementation of competitive projects; methodological training; striving for continuous personal and professional improvement; high communication readiness, including in an inter-professional team; professional responsibility and ethics. The conducted survey allows to conclude that the training of future civil engineers and architects of KPITTU, TTU, TTPU and SamSACII and their readiness to solve professional problems as a prerequisite to enter the master's course is at a good level.

Review of International Courses

A review of international CH courses was done from which 8 with a similar profile were evaluated (Figure). International master's programs for CH generally covers *restoration, research methods, projects and historical information.* In the

proposed Master's program 56% of the courses covers civil engineering disciplines, 12.5% for restoration and the remaining for other required courses.
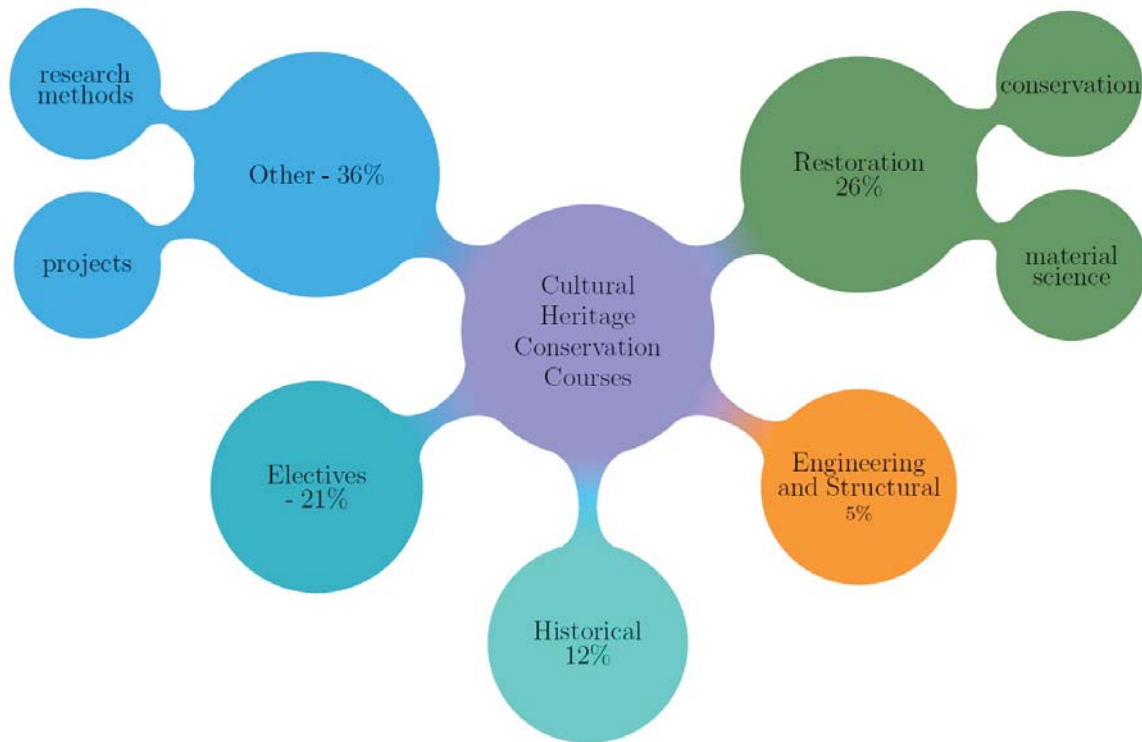

Figure 3. Review of International Master's Degrees on Cultural Heritage

Overall Pedagogical Approach

A blended learning approach which combines online educational interaction with traditional classroom methods will be used and encouraged for the M.Sc. Course. This approach will provide a robust and reliable platform that can safeguard against obstacles that may occur as a result of COVID-19 or other circumstances. The participants will be encouraged to make use of peripatetic teaching and distant learning platforms in order to adapt to the best practices in academia and meet the changing needs of students. This will present a chance for further support by current partner universities.

The volume of open educational resources (OER) has expanded over the past two decades and transformed the teaching and learning environment and has contributed to the development of major revolutionary technology. Figure shows the eight main attributes of open pedagogy which represents a new culture of learning that has occurred.
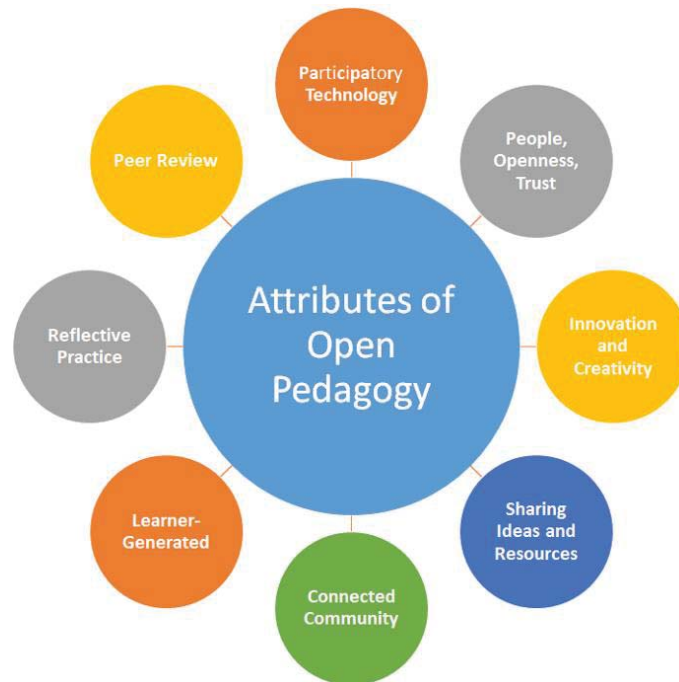
Figure 4. Eight attributes of Open Pedagogy [1]

This has been brought about by connected communities through the internet and digital technologies. Participants will be encouraged to be adaptive to stimulate innovation and creativity using these features.

The training will include the use of reinforcement techniques to supplement lectures that present new concepts, terms and processes by using media didactics or demonstrations. There will also be presentations on student-centered project-based learning to address real world problems. The project also aims to inspire the development of an international classroom environment to overcome language barriers and academic cultural differences in order to prepare students for the global labor market. The training program additionally provides a suitable foundation for future cooperation between partner institutions.

General Structure of Required Master's Course

The general structure of the master's course relies on the foundation given by undergraduate study programs in engineering and architecture taught in Uzbekistan and Tajikistan. Additionally, it reflects the need and high demand of courses covering the topics of: geomatics, seismic engineering, structural engineering hydrogeology, restoration and geotechnics.

After the first investigations, some of the most important stake-holders in Uzbekistan and Tajikistan were invited to a Workshop to illustrate which are the requirements for a future generation of civil engineers and architect able to work in a team to face the complex and multidisciplinary problem of the safeguards of Cultural heritage assets in Central Asia.

At the end of this Workshop. A strategic agenda has been prepared and used to define the detailed contents of the ERAMCA Master.

The two-year master's course is divided in four semesters (two years). The overall number of 120 ECTS credits assign for the master's course is divided on 30 ECTS per semester (60 ECTS per year). It includes electives (E) and compulsory modules (C), professional practice and master's thesis. In the first two semesters elective modules are included in order to facilitate different educational bachelor programme backgrounds of architectural and civil engineering students.

In the 1st year the students are provided with theoretical backgrounds on different disciplines with basic training and examples to learn the use of software and instruments. In the 2nd year the course focuses on the analysis and data collection from specific case studies where students can elaborate the idea for the final thesis.

The master's course is comprised of four compulsory modules (C) in the 1st, 2nd and 3rd semesters. The courses in the winter semesters, are be mainly taught by a combination of in-class and teaching methods, while the summer semester is open for field-work or in-situ teaching. The number of 6 ECTS (or 12 ECTS) credits are assigned per module. The project-based learning (PBL) in the 3rd semester will be coordinated by senior lecturers.

The 4th semester is comprised of research (laboratory or field work) oriented master's (M. Sc.) thesis writing and submission (research-based learning) of total 20 ECTS, and prior to that, the compulsory training period e.g. professional practice (stakeholders) as a work-based learning pedagogical approach of total 10 ECTS. Each discipline introduces a more detailed information by considering the selected case study. The remaining credits are devoted to develop the analysis and solution proposals on the specific case study.

Learning Outcomes

With respect to the nature and purpose of the proposed master's course, where students are bringing different background from their undergraduate education i.e. architectural or civil engineering, the category of the master's course becomes truly multi-disciplinary. The master's course will also provide an opportunity to integrate the technical and non-technical skills of engineering and to develop a commitment to professional and social responsibility and ethical codes. Graduates from an accredited master's course must comprehend the learning outcomes described below, including the acquisition of knowledge, with respect to i.e. build on their, entry (relevant) engineering discipline (architecture or civil engineering).

The learning outcomes stated are at enhanced and extended levels, the balance of which will vary according to the content and aims of each module. Crucially, master's students will have the ability to integrate their prior knowledge

and understanding of the discipline and engineering practice with the development of advanced level knowledge and understanding, to continue their education at postgraduate level, or to solve a substantial range of environmental engineering problems, that may be complex or novel. They will have acquired much of this ability through individual and/or group projects. Ideally, some of these projects would have industrial involvement or be practice-based. In general, the recognition of the learning outcomes will be arranged by the use of ECTS credit points. The learning outcomes are summarized as follows:

Science and Mathematics

Civil engineering and architectural education are necessarily relying on science and mathematics. With the main science and mathematical knowledge developed in an undergraduate programme, Masters graduates will therefore need additionally:

- A comprehensive understanding of the relevant scientific principles of the specialisation;
- A critical awareness of current problems and/or new insights most of which is at, or informed by, the forefront of the specialisation;
- Understanding of concepts relevant to the discipline, some from outside engineering, and the ability to evaluate them critically and to apply them effectively, including in engineering projects.

Engineering Analysis

Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. The main engineering analysis abilities are developed within an undergraduate programme; therefore, Masters graduates will additionally need:

- Ability both to apply appropriate engineering analysis methods for solving complex problems in engineering and to assess their limitations;
- Ability to use fundamental knowledge to investigate new and emerging technologies;
- Ability to collect and analyse research data and to use appropriate engineering analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods.

Architectural and Engineering Design

Design at this level is the creation and development of an economically viable solution to meet a defined need. It involves significant technical and intellectual challenges and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. The main

design abilities will have been developed in an undergraduate programme; therefore, Masters graduates will additionally need:

- Knowledge, understanding and skills to work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies;
- Knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations;
- Ability to generate an innovative design for products, systems, components or processes to fulfil new needs.

Economic, Legal, Social, Ethical and Environmental Context

Engineering activity can have impacts on the environment, on commerce, on society and on individuals. Master Graduates therefore need the skills to manage their activities and to be aware of the various legal and ethical constraints under which they are expected to operate, including:

- Awareness of the need for a high level of professional and ethical conduct in engineering;
- Awareness that engineers need to take account of the commercial and social contexts in which they operate;
- Knowledge and understanding of management and business practices, their limitations, and how these may be applied in the context of the particular specialisation;
- Awareness that engineering activities should promote sustainable development and ability to apply quantitative techniques where appropriate;
- Awareness of relevant regulatory requirements governing engineering activities in the context of the particular specialisation;
- Awareness of and ability to make general evaluations of risk issues in the context of the particular specialisation, including health & safety, environmental and commercial risk.

Professional Practice

The main engineering practice abilities will have been developed in an accredited engineering undergraduate programme. Master's graduates will need to demonstrate application of these abilities where appropriate and additional engineering skills which can include:

- Advanced level knowledge and understanding of a wide range of engineering materials and components;
- A thorough understanding of current practice and its limitations, and some appreciation of likely new developments;
- Ability to apply engineering techniques, taking account of a range of commercial and industrial constraints;

- Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.

Additional General Skills

Graduates must have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:
- Apply their skills in problem solving, communication, information retrieval, working with others, and the effective use of general IT facilities;
- Plan self-learning and improve performance, as the foundation for lifelong learning/CPD;
- Monitor and adjust a personal programme of work on an on-going basis;
- Exercise initiative and personal responsibility, which may be as a team member or leader.

Discussion and Conclusion

The definition of the Master Course is based on the experience of European partners and collaboration with local institutions. The master's course facilitates the adaption to recognized needs in Central Asian partners which is reflected through the course structure i.e. modules, and the corresponding learning outcomes, arranged with the use of ECTS credit points. The project meetings were used to discuss the recognition of the learning outcomes at all project partner institutions according to commonly agreed and unique performance equivalents.

In preparation of the recognition of the Master Course curriculum, the courses have to be accredited at some of the partner universities. The corresponding accreditation procedure will be one of the first tasks of the Master Course initialization. The designed master's program is more engineering based than others to facilitate the project objectives and assessed needs. The Master's course will provide a good forum for training and academic debate in Central Asia. The concepts and methods used for this project were successfully implemented to achieve the project's objectives.

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MOTIVATION ISSUES OF ARTISTIC STUDENTS TO ENTREPRISE IN THE CREATIVE AND CULTURAL INDUSTRIES (Erasmus + MUSAE CBHE project)

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Abstract: One of the aims of Erasmus+ MUSAE project is to train enterprise mentors in art education. Teachers trainings gave opportunities to get new knowledge and best experience of European partner universities. Enterprise educator should know the deep mechanisms that keep individual entrepreneurs in the creative and cultural industries motivated in this insecure and fast-paced

environment. This article researches motivation issues of artistic students to enterprise activities.

Key words: enterprise mentors, creative and cultural industries, motivation, inspiration, passion, entrepreneurial skills.

ПРОБЛЕМЫ МОТИВАЦИИ СТУДЕНТОВ-ХУДОЖЕСТВЕННИКОВ К ПРЕДПРИНИМАТЕЛЬСТВУ В ТВОРЧЕСКОЙ И КУЛЬТУРНОЙ ПРОМЫШЛЕННОСТИ (Erasmus + MUSAE CBHE project)

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Аннотация: Одной из целей проекта Erasmus+ MUSAE является подготовка менторов по предпринимательству в сфере художественного образования. Тренинги для преподавателей дали возможность получить новые знания и лучший опыт европейских университетов-партнеров. Преподаватель предпринимательства должен знать глубинные механизмы, которые поддерживают мотивацию индивидуальных предпринимателей в творческой и культурной индустрии в этой небезопасной и быстро меняющейся среде. В статье исследуются вопросы мотивации творческих студентов к предпринимательской деятельности.

Ключевые слова: корпоративные наставники, творческие и культурные индустрии, мотивация, вдохновение, страсть, предпринимательские способности.

Introduction

Motivation of art students to become an entrepreneur is often complex and multifaceted. Traditionally, scholars studying entrepreneurs have focused on individual traits and behaviours in an effort to investigate who the entrepreneur is. This approach has delivered the understanding two sources of motivation. They called it autonomy motives which is associated with task characteristics of being self-employed and motives as the personal drive of success. An entrepreneur's motivational state of mind plays a central role in success and context may influence that motivational state. How entrepreneurs feel about their entrepreneurial activities is highly important in connecting an entrepreneur's creativity to innovative organizational outcomes.

Discussions

During the visit to the International meeting in the frame of Erasmus + MUSAE CBHE project that took place at Conservatory of L'Aquila, Italy, the working groups from the National Institute of Fine Art and Design Named After

Kamoliddin Bekhzod and State Conservatory Of Uzbekistan participated the session on The entrepreneurship and experience concept creation model. Session was held by Jeroen Malaise (Artesis Plantijn – AP), Pia Kreus and Heidi Luck (JAMK University of applied sciences - JAMK), and Inge Simoens (Artesis Plantijn – AP).

As we know in recent years there has been significant growth in enterprise education in EU countries. Embedding entrepreneurship education in higher education can be an important vehicle for ensuring students are prepared for life beyond their education institutions. Enterprising mindsets coupled with the skills gained through MUSAE could be the perfect recipe to support the future employability of students.

Enterprise educator in arts universities should be aware about what extent artistic students are ready to accept new skills for them. And the issue of motivation to be become an entrepreneur is crucial.

In the creative and cultural industries, entrepreneurs can be seen as persons who are in need of a continuous state of motivation with respect to their work. Artists and other creative individuals are involved in an ongoing creative process and attribute their best work to unknown forces and mechanisms. It may be generally perceived as 'inspiration'. The individual has little control over this state and it seems to arise without an apparent cause. It implies transcendence beyond the ordinary concerns and limitations of routine human behaviour and an increasing awareness of new possibilities. Moreover, inspiration entails motivation; it compels individuals to realize their ideas. As such, inspiration may be applied directly to the specific domain of creative activity.

It is argued that passion fuels motivation, enhances well-being and provides meaning. Entrepreneurial passion in the creative industries may differ from that in other industries as the creator of the product is involved in the development of a product or service from the generation of the idea to deciding on what the marketable characteristics are of a product. Passion in the context of cultural and

creative entrepreneurs not only refers to the passion they have for running a business, which is more prevalent in other industries, but more the desire to have their creative processes result in marketable products. These activities may consist of routinely and non- routinely activities, meaning that passion in this setting includes the day-to-day work of creative entrepreneurs performed in order to turn creative ideas into creative products.

Italy, L'Aquila, the Academy of Fine Arts of L'Aquila ABAQ laboratories

Conclusion

At the heart of every creative is an artist. That artist is driven to express something and is internally motivated. The tension arises when their art demands time and energy, but the work created may not bring an income. "A career as an artist is often considered fraught with risk, personal challenges and insecurity. Despite this scenario, individuals with a pent for creative expressions continue to either pursue a career via independent learning, while many complete tertiary studies and gain a formal qualification." (Daniel, 2016)

Turning creative ideas into creative products or services is a crucial activity for the creative entrepreneur. We consider inspiration and passion to be the motivational response to a creative idea, preceding this process of transformation. Teachers need a broad range of competencies to successfully motivate artistic learners to entrepreneurship . Entrepreneurship teaching doesn't provide answers, but supports students to identify the right questions. It should look to push boundaries, encourage and motivate students to think creatively, be confident enough in their own ability and entrepreneurial skills.

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IV. ИНФОРМАЦИОННО-АНАЛИТИЧЕСКИЙ МАТЕРИАЛ

ERASMUS+ ACTIVITIES IN UZBEKISTAN: WHAT HAS BEEN DONE, SELECTION RESULTS OF CALL-2022 AND NEW CALL-2023

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Abstract: The paper presents the Erasmus+ programme developments in Uzbekistan, selection results of Call-2022 and encourages starting preparation of new applications to be submitted within the next Call-2023 to be launched in November 2022. Information activities of the National Erasmus+ Office and Higher Education Reform Experts for the period of 2015-2021 towards the effectiveness of the Erasmus+ projects and promotion of best practice and innovations are briefly described. The programme impact on modernisation and the overall reform process of the national higher education system, as well useful information sources and tips are provided to potential applicants.

Key words: Erasmus+ projects, impact, modernisation of higher education, innovations, best practice, information activities.

O'ZBEKISTONDA ERASMUS+ FAOLIYATI: HOZIRGI YUTUQLAR, 2022 YILGI TANLOV NATIJALARI VA YANGI 2023-YILGI TANLOVI

Abdurakhmanova A.

Annotatsiya: Maqolada dasturning O'zbekistondagi faoliyati, 2022 yilning tanlov natijalari, shuningdek, joriy yilning noyabr oyida e'lon qilinadigan 2023 yil uchun navbatdagi tanlov doirasida yangi loyihalarni ishlab chiqishni boshlashi mumkin bo'lganlar uchun ma'lumotlar keltirilgan. Shuningdek, Erasmus+ milliy ofisi va Milliy ekspertlar guruhining 2015 yildan 2021 yilgacha bo'lgan davrda Erasmus+ loyihalari samaradorligini oshirish hamda ilg'or tajriba va innovatsiyalarni tarqatishga qaratilgan targ'ibot tadbirlari tavsifi berilgan. Dasturning davlatimiz oliy ta'lim tizimini modernizatsiya qilishdagi ta'siri, shuningdek, zarur axborot va maslahat manbalari navbatdagi dastur tanlovining potensial ishtirokchilari uchun foydali bo'ladi.

Kalit so'zlar: Erasmus+ loyihalari, ta'siri, oliy ta'limni modernizatsiya qilish, innovatsiyalar, ilg'or tajribalar, targ'ibot ishlari.

ДЕЯТЕЛЬНОСТЬ ERASMUS+ В УЗБЕКИСТАНЕ: О ТЕКУЩИХ ДОСТИЖЕНИЯХ, РЕЗУЛЬТАТАХ КОНКУРСА 2022 ГОДА И НОВОМ КОНКУРСЕ 2023 ГОДА

Абдурахманова А.

Аннотация: В статье представлены деятельность программы в Узбекистане, результаты конкурса на 2022 год, а также информация для тех, кто может начать разработку новых проектов в рамках нового конкурса на 2023 год, который был объявлен в ноябре текущего года. Дано также описание информационной деятельности Национального офиса Erasmus+ и команды экспертов в период с 2015 по 2021 годы, направленной на повышение эффективности проектов Erasmus+ и распространение передового опыта и инноваций. Влияние программы на модернизацию системы высшего образования страны, а также необходимые источники информации и советы будут полезны для потенциальных участников очередного конкурса программы.

Ключевые слова: проекты Erasmus+, влияние, модернизация высшего образования, инновации, передовой опыт, информационная деятельность.

Erasmus+ in Uzbekistan 2014-2020

The second part of the 1st phase of the Erasmus+ programme (2017-2021) has coincided with period of rapid transformations and important decisions aiming to improve the quality of higher education system of Uzbekistan. It has greatly increased the relevance and importance of rapidly developing international cooperation. One of the important areas of this cooperation in Uzbekistan is the Erasmus+ programme, involving a total of 65 universities from all regions of the country. Erasmus+ programme is one of key directions of cooperation not just with the European universities, but also with universities in Central Asia, CIS member states and other regions of the world.

Thanks to Tempus and Erasmus+ programmes the higher educational institutions of Uzbekistan could greatly enrich their experience of cooperation with universities in the European Union and in the neighbouring countries, develop a number of joint master's programmes, create joint departments and unique scientific laboratories, which had a significant impact on improving their international recognition and ranking.

The relevance of the Erasmus+ programme, its wide range of activities and opportunities for long-term cooperation are aligned with the goals outlined in the Concept for the Development of Higher Education of the Republic of Uzbekistan until 2030. The advanced teaching technologies introduced within the framework of joint projects, educational platforms established, and access provided to the educational resources of European universities greatly supported the transition of the entire education system to the online format in the context of the pandemic in 2020-2021. Virtual mobility and combined mobility allowed for the personal development of teachers, participation in joint publications and continued joint research studies for the researchers at the universities in the country.

Tempus&Erasmus+ projects, their participants and European countries' experience in general have contributed to capacity building of the Uzbekistan HEIs for the introduction of ECTS and gradual transition to a credit-modular system structure. Undoubtedly the benefits of ECTS are numerous in a view of internationalisation in overall. The specific seminars of HEREs on ECTS were positively evaluated by participants thanks to practically oriented approach and involvement of the participants of on-going projects aimed on development of new ECTS-based curricula, who shared their experience. Undoubtedly 26-year cooperation within Tempus, Erasmus Mundus and Erasmus+ and enhanced capacity of teams facilitated the decision of the Government in 2019 to follow the Bologna principles and to introduce ECTS to all HEIs of Uzbekistan by 2030. It was clearly highlighted in the Concept of HE development by 2030 adopted by Presidential Decree on 8 October 2019.

The NEO and HEREs considerably contributed to the development of the Concept. The working group on ECTS established in the Ministry directly involved HEREs and also the Erasmus project coordinators/participants. To this end, the Cabinet of Ministers' Resolution No 824 dated 31/12/2020 "On measures to improve organisation of education process in higher education institutions" can also be named since it was heavily influenced by the CBHE and International Credit Mobility projects.

Within six Calls of Erasmus+ programming period 2014-2020 in total 43 Erasmus + CBHE projects were financed for Uzbekistan, including 12 national projects, involving European and Uzbek universities, 11 cross-regional projects, and 20 regional projects with the participation of HEIs both from Uzbekistan and other Central Asian countries.

The total project budget allocated for 43 Erasmus+ CBHE projects is €36.6 million euro, including about €11.5 million (31.4%) particularly for HEIs in Uzbekistan.

The first three places among 10 leading Uzbek HEIs in the Tempus IV and Erasmus+ CBHE projects are occupied by the Tashkent University of Information Technologies (TUIT), Bukhara State University and the National University of Uzbekistan (NUUz). For the first time in the history of Tempus and Erasmus+ CBHE projects, TUIT became the Project Grantholder, which demonstrates the enhanced capacity of the project teams in Uzbekistan, the high quality of applications with the participation of Uzbek HEIs and a certain level of trust with regards to the HEIs of Uzbekistan.

Erasmus+ information and promotion activities

The National Impact Study (NIS) report (2014-2020)[22] itself and in particular the findings and recommendations have been considered and applied as one of the key sources for overall promotion and dissemination activities of the NEO&HEREs thanks to description of impressive facts on Erasmus+ programme impact in Uzbekistan justified by statistics and infographics of NIS posters.

The following finding could be considered as a slogan for the content of the overall Erasmus+ promotion activities: "… without the impact of the Tempus and Erasmus+ projects it would hardly had been possible to achieve such a rapid modernization of higher education in Uzbekistan in 2017-2020…"

During 2021 the main focus was put on promotion of the findings, conclusions and recommendations of a number of studies, conferences and round table discussions which were held in 2020 – the last year of the previous Erasmus+

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[22] National Impact Study was carried out in November-December 2020. The report was published on NEO website: http://www.erasmusplus.uz/news/Materials-Study-of-the-Impact-of-Erasmus-Projects.htm

phase (2014-2020) with the aim to evaluate the programme impact on higher education at the regional level in Central Asia.

Annual NEO publications "Erasmus+ in Uzbekistan" and ICM publication[23] proved to be very useful for promotion of programme impact by describing specific project success stories. Copies of both annual NEO publication and HERE journal "Perspectives of HE development" [24] have been submitted to the National Library of Uzbekistan in order to be accessible to wide public. Also they are submitted to the Ministry of Higher and Secondary Specialised Education (MHSSE), the State Inspectorate for Supervision of Quality in Education (SISQE) and made available on UZ NEO booth at the entrance of the EU Delegation.

Thanks to online format of majority Erasmus+ events organised in other partner countries the local NEO& HEREs in Uzbekistan benefited of access and had an opportunity to promote the regional and cross-regional cooperation. The video recordings on Zoom Platform and YouTube were well exploited for the overall promotion activities.

Joint promotion activities of the NEOs in partner countries has been strengthened during preparation of Virtual CBHE Fair [25]organised by EACEA on 26-27 October 2021. The focus was put on interesting information and inspiration for future projects and the presentations of all projects as well as video recordings of the Project Results sessions. The website is quite relevant to find out the already covered thematic areas/subjects and to consider synergy opportunities.

In the framework of the Erasmus + programme, in addition to financing of joint projects for higher education institutions, support has been provided for the National Teams of Higher Education Reform Experts-HEREs in cooperation with the Ministries of education in the partner-countries.

The HEREs activities are focused on support to modernization of higher education according to the national policy and its strategy of higher education development.

The main goal of the national Higher Education Reform Experts' team is to disseminate information about the developments in the country's higher education system as well as transformations in the European Higher Education Area covering 49 countries of the Bologna Process.

The membership of the National team was updated following the proposal of the MHSSE, respectively designated by the EU Delegation to Uzbekistan and approved by Executive Agency.

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[23] https://erasmus.uz/en/page/55-neo-and-heres-publications

[24] https://erasmus.uz/en/page/89-88-heres

[25]. The Capacity Building in Higher Education (CBHE) Virtual Fair took successfully place from 26 – 27 October 2021, raising awareness and inspiring on how results of CBHE projects can improve the Higher Education sector in Partner countries. Thematic sessions showcased best practices and results achieved by 2015-2020 funded projects. https://cbhevirtualfair.com/

Initiated by the National team the HEREs` annual publication "Perspectives of HE development", which has been published as a scientific and methodological collection since 2011, was officially registered as a peer-reviewed scientific and methodological journal "Perspectives of higher education development" in 2020.

The MHSSE supports this publication, which was stated in regular foreword for each issue. One of the strengths of EU HE cooperation programmes is prompt and flexible reaction to the latest developments of higher education. It is also characterized the activities of the National team similar to activities of CBHE and ICM projects. For example, during pandemic period a number of seminars on the most relevant topics for HEIs were organised by the NEO and HEREs with support of the MHSSE and SISQE:

•The main problems faced by the Erasmus+ projects for the pandemic period and recommendations on their solving.

•ECTS

•Online teaching and training.

Online photo and video exhibition of Tempus and Erasmus+ projects organised within two Erasmus+ weeks a year (in spring and autumn) have been a tradition to undertake with online voting for the best ones and awarding them with Erasmus+ promotion materials.

Specific efforts have been undertaken by the NEO team for joint preparation of opening project events and final dissemination conference, including invitation of relevant stakeholders, press-release and event agenda drafting.

Continuous cooperation with press-service of the MHSSE and the consolidation of efforts on promotion and information of Erasmus activities and different programme actions contributed to better structured cooperation and considerable raise of programme visibility.

A number of activities/traditional events have been organised jointly or under auspices of the EU Delegation to Uzbekistan: Education Fairs, Pre-departure orientation meeting (PDO) for the successful Erasmus Mundus students, European Film festivals, Erasmus+ Week within Europe Days in May, including traditional meetings of the EU ambassador with students and teachers at the local universities in country regions.

The results and best practice of the completed Erasmus+ CBHE projects can be found on project websites and specific news/posts published by NEO in Telegram and other social networks. The following projects have promoted the results on project websites: NICOPA, HIEDTECH, UNICAC, DECIDE, TALENT, ELBA.

There are 18 on-going CBHE projects (October 2022) involving 43 local HEIs, including 14 HEIs from Tashkent and 19 HEIs from 10 country regions and

Karakalpakstan, 58 HEIs from 24 EU MS, 71 HEIs from 8 Partner Countries. The MHSSE has been involved in HIEDTEC, MechaUz and MUSAE projects.

Results of 2022 selection of Erasmus+ Capacity Building for Education

In total 145 new projects have been selected as a result of the 2022 Call for Proposals for Erasmus+ 'Capacity Building in Higher Education'. This is the first Call of the second phase of Erasmus+ (2021-2027).

The following number of projects is selected under three new Strands:

•27 "Strand 1" projects: smaller-scale projects aimed at newcomers;

•105 "Strand 2" projects: partnerships for transformation in higher education, similar to the joint projects pre-2021;

•13 "Strand 3" projects: aimed at higher education reform, previously known as to structural projects and with a role for Higher Education national authorities.

A further 27 projects are on a reserve list, including 2 projects with Uzbekistan universities. Due to high level of ineligibility only 429 proposals out of 620 submitted applications went on to the evaluation process. The success rate is therefore 33% of eligible applications.

According to Erasmus+ Multiannual Indicative Programme a total budget of EUR 34.5 m is envisaged for CBHE action for Central Asia (Region 6). Eight new projects with budget of EUR 5.76m involving only partners from the region have been selected for Central Asia, except cross-regional projects. Uzbekistan HEIs will be involved in one cross-regional project for development of new Master programme in Eco-Mining and Innovative Natural Resources Management.

The increasing interest of the local HEIs throughout the country (in the regions in particular) to extending cooperation opportunities within Erasmus+ has been supported by their gradually enhancing absorption capacity. The outcomes of the annual Erasmus+ Calls for proposals have once again demonstrated the high level of interest of the universities of Uzbekistan in participating in the programme, as number of applications increased by average 20% every year.

Seven new "Capacity Building in Higher Education (CBHE)" projects involving Higher Educational Institutions (HEIs) of Uzbekistan have been selected for funding as a result of the Call-2022.

Within newly selected projects 19 universities of Uzbekistan, including 9 Tashkent HEIs and 10 HEIs from 5 country regions will cooperate with 18 universities from 13 countries of the European Union, 19 universities from Central Asian countries and 3 universities of Ukraine.

The total budget of 4.5 million Euro will be allocated to 7 newly selected projects, including 2.1 million Euro envisaged for participation of 19 universities of Uzbekistan.

Four projects will be realised in the field of Bio-medical Engineering, Food Science and Technology, Water Sector for Climate Resilience and Security in

Central Asia, Building Educational and Research Capacities in Nutrition and Dietetics in Central Asia. Three projects will be aimed on development of new Master programmes in the field of Medical Engineering in Uzbekistan, Photonics and Optical Communications, Eco-Mining and Innovative Natural Resources Management.

The enhanced capacity of the Uzbekistan HEIs in project design and project management has been proved by fact, that for this round there **are three university-grantholders from Uzbekistan**: Andijan Machine Building Institute and Tashkent Chemical-Technological University for the first time and the Tashkent University of Information Technologies with the on-going experience of CBHE project Grantholder. It is evident that capacity of the local universities has been considerably enhanced and the level of project ownership raised as this round three Erasmus+ CBHE projects will be coordinated by universities of Uzbekistan.

Five universities-newcomers to CBHE will join Erasmus+ community of Uzbekistan: branch of the Tashkent University of Information Technologies in Urgench, branch of the Tashkent Medical Academy in Urgench, Navoi State Mining Institute, University of World Economy and Diplomacy and Yeoju Technical University in Tashkent.

Within the last call four new Jean Monnet projects and one Marie Sklodowska Curie project for Uzbekistan have been selected for funding as well. The results of Erasmus+ International Credit Mobility will be available soon.

Erasmus+ International Credit Mobility (ICM)

Most of the ICM projects with the participation of Uzbek HEIs are based on cooperation established by the joint implementation of CBHE projects. The mutually beneficial combination of simultaneous participation in CBHE and ICM projects was many times noted by the members of project teams in the HEIs of Uzbekistan. Within the framework of mobility, opportunities for advanced training are used in the course of implementation of CBHE projects.

ICM partnerships support the CBHE projects aimed at improving curriculum, expanding opportunities for professional development and exchanging experience in universities of EU member states. A good example of this relationship is the cooperation of the National University of Uzbekistan and the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers with Paris Lodron University of Salzburg (PLUS) in Austria at the same time under the CBHE DSINGIS project (http://www.dsingis.eu/) and the ICM partnership.

Due to participation in CBHE projects and the establishment of new partnerships, as well as effective interaction, European partners decided to develop cooperation under the ICM as well. It allows to expand cooperation and exchange of faculty and students. For example, the cooperation of TSAU with the University of Porto initiated under the framework of BUzNET (https://buznet.up.pt) was

expanded due to winning an ICM project, as which is also the case for a number of other universities, and they also used the opportunity to deepen and expand bilateral cooperation

Improved academic mobility in the national HEIs has significantly contributed to the increase in education accessibility, improvement of quality and efficacy of education, as well as improvement of functioning of international departments, mutual recognition and ensuring the mobility of human capital.

ICM partnerships serve as a guarantee of continued cooperation under the joint projects, which contributes to further study of advanced pedagogical technologies, improvement and development of curricula and teaching materials based on international best practices, improvement of teaching quality and increasing efficiency of the international and student service units.

The faculty and administrative staff of departments in HEIs that were not directly involved in ICM projects had the opportunity to acquire certain experience and knowledge from their colleagues through workshops conducted by participants of mobility to Europe.

Short-term mobility in European universities has become an important tool for the faculty supporting their professional and personal development, due to the unique opportunity to enhance their qualifications and come back with new teaching approaches and methods.

Mobility projects also helped in establishing friendly contacts with colleagues at partner universities, which was followed by the publication of joint scientific papers and articles, invitations to international events and exhibitions, as well as submitting new project proposals and joint participation in the next ICM projects or in other areas of the Erasmus+ programme.

Currently in the national HEIs the period of mobility for the faculty and administrative personnel is recognized as professional development. Due to the government decisions on the introduction of a credit and module system in 35 national HEIs from the 2020-2021 academic year, and the transition to ECTS for all HEIs, the mobility experience in European universities has become even more popular and recognized. In the welcoming speeches of the MHSSE management at Erasmus events there was a reiteration of a direct connection and influence of the EU funded Erasmus+ programme on the adoption of the key decision on the transition to ECTS as one of the key instruments for the internationalization of higher education. Particular importance is attached to increasing the involvement of professors and doctoral students from European universities in the teaching process of the national HEIs, as they can visit under the credit mobility initiative. More than 640 representatives of European universities took the opportunity to lecture and conduct classes, workshops and master classes at the national HEIs. Due to this, many Uzbek lecturers and students were able to build their qualifications

without leaving the country. In addition to the academic activities, the visits of the European partners facilitated the increase in the number of joint scientific works and joint research in scientific centres and laboratories, development of joint publications and expansion of scientific contacts in general.

Jean Monnet in Uzbekistan[26]

Considering a small number of qualitative applications from Uzbekistan for 2015-2020 the NEO&HEREs have undertaken specific efforts to provide support to Jean Monnet applicants through a number of methodological seminars on project development. The efforts resulted in 4 new Jean Monnet projects selected within 2022 Call.

- Jean Monnet Module "EPOCA: European Economic Integration: Policies, Mechanisms and Lessons for Central Asia", submitted by Bukhara State University
- Jean Monnet Module: "EUCAA: EU foreign policy in Central Asia and Afghanistan", submitted by University of World Economy and Diplomacy
- Jean Monnet Chair "CACETL: Central Asian Centre for European Trade Law", submitted by Westminster International University in Tashkent
- Jean Monnet Center of Excellence "ECESBF: Erasmus Center of Excellence in Sustainable Business and Finance", submitted by Tashkent State University of Economics

Marie Sklodowska Curie Actions (MSCA) project in Uzbekistan

The first-ever MSCA project of Horizon Europe[27], involving Tashkent State University of Economics and Tashkent State University of Law, has been selected for funding. The project "Caucasus and Central Asia Research Social Innovation: Development Assistance, Innovation and Societal Transformation-CARSI" is a training and research programme bringing together 16 leading institutions across two continents with a major focus on the Caucasus and Central Asia to train fellows through secondment and eventually produce new empirical evidence on the region. By processing first-hand data and thus identifying the gap between declarative approaches and reality with regards to social innovation CARSI teams will define new relationships between global social innovation approaches and social theory while working to translate research findings into policy recommendations.

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[26]More detailed information about Jean Monnet projects in Uzbekistan can be found on NEO website https://erasmus.uz/en/page/77-jean-monnet-projects-database. The database of overall worldwide Jean Monnet activities for 1995-2021 is available on EACEA website https://www.eacea.ec.europa.eu/grants/2021-2027/erasmus/jean-monnet-activities-database_en

[27] https://marie-sklodowska-curie-actions.ec.europa.eu/

Call-2023

The forthcoming 2023 Call will be launched in November 2022, however the information campaign has been started as no major changes are expected in the next Programme Guide. Therefore the previous version of Erasmus+ Programme Guide[28] should be considered as the main source of information on the programme actions. For Strands 1 and 2 of CBHE projects, proposals must respect pre-defined regional priorities, which are published on the Funding and Tenders Portal (FTOP)[29].

Considering the fact that within 2022 Call only 429 out of 620 submitted proposals went to evaluation process the eligibility criteria would be clarified repeatedly and ineligibility levels will be tackled in promotion of the 2023 Call.

The following Actions are open for Uzbekistan:

Key Action 1. International Credit Mobility

Key Action 2. Capacity building in the field of higher education

         Erasmus Mundus Joint Masters

         Erasmus Mundus Design Measures

Key Action 3. Jean Monnet actions.

All necessary information about application procedure is available on the website of the Erasmus+ and EACEA website.[30]

Partner search and electronic submission

Electronic submission (eSubmission) is mandatory for international open, restricted and negotiated procedures in direct management for tenders of EU External Actions DGs since March 2022. This means that paper submissions are no longer applicable for these procedures. Before submitting their application online via eSubmission, the tenderer (the leader and all the members in case of consortium) must first register in the Funding&Tenders Portal (OPSYS ecosystem) to obtain a 9-digit Participant Identification Code. If the leader and/or participant have already registered in the Participant Register and know their credentials, they can search for their PIC and use it when submitting tenders or requests to participate in eSubmission, otherwise they will need to register their entity in the Funding & Tenders Portal.

In the course of the procedure, tenderers (including consortium members) may be contacted by European Research Executive Agency (REA) validation services and requested to submit documents. Based on these documents their PIC will be validated once and for all. The validated PIC will then allow tenderers to

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[28] https://erasmus-plus.ec.europa.eu/programme-guide/erasmusplus-programme-guide

[29] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

[30] https://erasmus-plus.ec.europa.eu/ and https://www.eacea.ec.europa.eu/index_en

subscribe to any future call, as well as to manage their contract(s) electronically in the Funding & Tenders Portal.

For potential applicants

Within the last Call for Proposals-2022 a number of information and methodological seminars "How to prepare a good project proposal" took place for the period of November- December 2021 in each country region. The features of Strand 1 of CBHE have been presented for newcomers in more detailed way.

Specific efforts of the NEO have been undertaken in order to mobilise new partners in Uzbekistan through organisation of Erasmus+ events for representatives of faculties and departments without any international experience and supporting them in partner search both in Europe and Uzbekistan. Specific training session on how to prepare high quality project applications and how to enhance the role of local partners ensuring high level of local project ownership was a compulsory part of any Erasmus information event organised by the NEO and HEREs in different country regions.[31]

The local CBHE, JM and ICM teams contributed to methodological seminars as well by sharing their experience in partner search, project development and management. Therefore the specific results and achievements of Erasmus+ cooperation can be found as well.

Involvement of newcomers and exploring new subject areas for future projects has been supported by the Ministry of Higher and Secondary Specilased Education (MHSSE). University-newcomers had a privilege to host Erasmus+ methodological seminars on how to develop good project proposals. Special sessions for MHSSE staff was organised by the NEO in order to explain the Strand 3 features (ex-structural projects with direct involvement of Ministry) and their role/benefit in this type of Erasmus+ projects.

During the information campaign a number of efforts of NEO&HEREs team, in particular individual meetings with potential applicants contributed to enhancing quality of applications with involvement of Uzbekistan HEIs, as well as to diversification of project topics, new thematic/subject areas and attracting HEIs/faculties/departments-newcomers.

Within new NEO workplan for 2022 the consolidated methodological seminar was organised in on-line format on 7 January 2022 with the aim to present the cooperation opportunities and to provide clarifications to the most frequently asked questions which were collected during 12 methodological seminars in December 2021.[32]

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[31] http://www.erasmusplus.uz/uz/news/page2.htm
[32] http://www.erasmusplus.uz/uz/news/Erasmus-metodologik-seminari.htm

The Erasmus+ project results platform[33] and Virtual CBHE Fair of October 2021[34] are particularly useful information sources for potential CBHE applicants in a view of avoiding duplication, diversification of thematic areas and innovativeness of their future proposals.

Useful materials for potential applicants covering partner search, project development, application submission, Funding&Tenders portal can be found on NEO website and social networks.[35]

The recommendations developed by participants of the Central Asian Erasmus+ CBHE cluster meeting[36] (November 2020) should also be considered while developing new project proposals.

November 7-8-10, 2022 the European Commission and the European Education and Culture Executive Agency are organising a worldwide webinar[37] on the opportunities available under the Erasmus+ programme and its global dimension. (https://erasmus-plus.ec.europa.eu/event/erasmus-world-wide-webinar)

This seminar is on Erasmus+ opportunities for exchange and cooperation that are open to organisations and individuals across the globe. It offers a unique opportunity for participants to better understand all aspects and benefits of these programmes. The webinar will be webstreamed.

The National Erasmus+ Information Day within new 2023 Call will be organised in close cooperation with MHSSE, SISQE and EU Delegation following the launch of the Call and publishing the Programme Guide. The Information Day will be followed by methodological seminars "How to develop a good project proposal" in the country regions. The NEO events calendar is regularly updated and made available through NEO telegram channels and social networks.

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[36] http://www.erasmusplus.uz/images/shared/file/CA%20Report_F.pdf
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ПЕРСПЕКТИВЫ РАЗВИТИЯ ВЫСШЕГО ОБРАЗОВАНИЯ

Научно-методический журнал

Цель журнала: повышение эффективности образовательного процесса путем анализа и информирования о прогрессивных методах, достижениях, тенденциях и проблемах в области высшего образования (ВО).

ТЕМАТИКА ЖУРНАЛА

- **Современные вызовы для системы высшего образования**

- **Инновационные методы и средства в ВО (**опыт зарубежных стран, вузов Узбекистана, прогрессивные методы обучения и преподавания, организации учебного процесса и управления вузами, использование ИКТ для инновационного развития ВО, образовательные платформы**);**

- **Программа Erasmus + (**задачи программы, опыт успешных проектов Erasmus + в Узбекистане и за рубежом, отчеты членов команды HEREs по итогам участия в международных семинарах, внедрение принципов Болонского процесса в Узбекистане и др.);

- **Кредитно-модульная система в ВО (**концепции, требования к переходу к кредитно-модульной системе, управление финансами в условиях КС, программы обучения, мобильность преподавателей и студентов, анализ зарубежного опыта, плюсы и минусы КС и др);

- **Автономия вузов** (экономические, организационные , технические аспекты, опыт ведущих стран, Узбекистана и др.);

- **Повышение квалификации, переподготовка кадров в ВО (**передовые учебные программы, опыт, методы и средства)

- **Научно-образовательная информация для вузов (**доступ к источникам информации для ВО, наукометрия, статистика использование ресурсов и публикационная активность);

- **Проблемы и перспективы инвестиций в высшее образование** (критерии инвестиций в ВО, опыт зарубежных стран, вузов Узбекистана, управление финансами, эффективность инвестиций, оптимизация использования материальных и кадровых ресурсов в вузах и др.);

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Журнал претендует стать одним из ведущих международных научных журналов по темам развития высшего образования в республике, с последующим увеличением периодичности и тиража, а также включением его в список аналитических систем Scopus и Web of Science.

Соответственно требования к статьям журнала приведены к международным стандартам по оформлению научных статей.

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      - Аннотация
      - Ключевые слова
      - Текст статьи
      - Список литературы

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- Количество стр. – от 10 до 15, интервал – 1.0
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Аннотация должна представлять собой самостоятельный текст. Аннотация должна быть посвящена статье – проведённому исследованию, а не предмету исследования в целом. Она представляет собой краткое, но информативное резюме статьи и включает характеристику основной темы, проблемы объекта, цели, основные методы, результаты исследования и главные выводы. В аннотации не допускается использование формул, аббревиатур, ссылок на позиции в списке литературы.

Важно! Аннотация пишется одним абзацем объёмом на языке оригинала - 500-600 знаков (около 100 слов), и на английском (около 100 слов). Аннотация на английском языке обязательна!

Требования к списку литературы

Список литературы приводится в алфавитном порядке, со сквозной нумерацией. Ссылки в тексте из списка литературы оформляются в квадратных скобках, например, [12]. Список литературы должен содержать не менее 10 источников. На все позиции списка должна быть ссылка в тексте статьи и наоборот – вся упоминаемая литература должна быть перечислена в списке литературы. При оформлении придерживаться соответствующих стандартов библиографического описания (например, ГОСТ 7.1- 2003 и др).

ЎЗБЕКИСТОНДА ОЛИЙ ТАЪЛИМ ИСЛОҲОТЛАРИНИНГ ДОЛЗАРБ МУАММОЛАРИ ВА УЛАРНИ ҲАЛ ЭТИШДА АҚШ ТАЖРИБАСИНИНГ АҲАМИЯТИ

Юнусов Ҳ. М.

Аннотация: Ушбу мақолада АҚШ таълим тизимининг тарихи, бугунги кундаги ҳолати, америка олий таълимининг ўзига хос хусусиятлари, хусусан, юридик таълимнинг эътиборга молик жиҳатлари, ўқув жараёнини ташкил этиш, таълим бериш услублари ҳамда олий таълимдан кейинги касбий фаолият масалалари ҳақида сўз боради. Шунингдек, унда олий таълимда ўқитиш методлари, аудиториядан ташқаридаги фаолият, олийгоҳларнинг халқаро ва миллий рейтинги, битирувчиларни иш билан таъминлаш, олий таълимдаги рақобат, таълим индустрияси, кутубхоналар фонди, олий таълимни ривожлантиришдаги полицентрик ёндашувлар, нодавлат ноҳукумат ташкилотлар ва уюшмаларнинг олий таълимдаги ўрни ҳақида фикр юритилади. Энг муҳими, мақолада Ўзбекистонда олий таълим ислоҳотларининг долзарб муаммолари ва уларни ҳал этишда АҚШ тажрибасининг аҳамияти хусусида муаллифнинг таҳлилий фикрлари баён этилган ҳамда аниқ таклиф ва тавсиялар илгари сурилган.

Калит сўзлар: олий таълим, таълим босқичлари, таълим дастурлари, аккредитация, таълим методлари, аудитория, меҳнат бозори, рақобат, таълим индустрияси, кутубхона хизматлари, хусусийлаштириш, полицентрик ёндашув, нодавлат ташкилотлар, касбий уюшмалар.

THE CURRENT PROBLEMATIC ISSUES OF HIGHER EDUCATION REFORMS IN UZBEKISTAN AND THE IMPORTANCE OF THE USA EXPERIENCE IN SOLVING THEM

Yunusov Kh.

Abstract: This article deals with the history of the US education system, its current condition, peculiarities of American higher education, especially, noteworthy aspects of the higher education, the organization of the educational process, teaching methods as well as issues on professional activities after higher education.

It also discusses teaching methods in higher education, extracurricular activities, international and national rankings of universities, graduate employment, competition in higher education, the education industry, the library fund, polycentric approaches to higher education, the role of NGOs and professional associations in higher education. Most importantly, the article presents the author's analytical views on current issues of higher education reform in Uzbekistan and the importance of the US experience in solving them, as well as specific proposals and recommendations elaborated by him.