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Arts

CREATIVE SEARCHES BAKHTIYAR ADAMZHAN

Jumasseitova Gulnara
Candidate of Art History,
Professor of the Kazakh National Academy of Arts

ТВОРЧЕСКИЕ ПОИСКИ БАХТИЯРА АДАМЖАНА

Жумасеитова Гульнара
кандидат искусствоведения, профессор
Казахская национальная академия хореографии

Abstract

The article examines the work of one of the leading soloists of the Astana Opera Theater Bakhtiyar Adamzhan in the aspect of the most vivid images embodied by him in the ballet "Spartacus" and "Beethoven. Immortality. Love." Through a detailed ballet analysis, the author reveals the individual features of the dancer's performing style, the peculiarities of acting expressiveness.

Аннотация

В статье рассматривается творчество одного из ведущих солистов театра «Астана Опера» Бахтияра Адамжана в аспекте наиболее ярких образов, воплощенных им в балете «Спартак» и «Бетховен. Бессмертие. Любовь». Посредством развернутого балетоведческого анализа автор раскрывает индивидуальные черты исполнительского стиля танцовщика, особенности актерской выразительности.

Keywords: ballet art, dancer, plasticity, acting expressiveness, technique of performance.

Ключевые слова: балетное искусство, танцовщик, пластика, актерская выразительность, техника исполнения.

Введение. Стремление говорить на языке танца, выражая им всю полноту и многообразие жизни - наиболее характерная тенденция современного балетного театра. Особое значение приобретает пластическая выразительность исполнителя. Поэтому художник освобождает тело танцовщика от лишних аксессуаров; костюм, как и оформление спектакля в целом, становится лаконичным и несет притом особую нагрузку, цветовую и конструктивную. Балетмейстеры в поисках выразительных средств стремятся к синтезу танцевальных форм: классического, современного, характерного и гротескового танцев, а также элементов пантомимы. Новое течение в хореографии рождает и танцовщиков нового типа, к которым можно отнести ведущего премьеры театра «Астана Опера» Бахтияра Адамжана.

Бахтияр Адамжан – ведущий танцовщик современного балетного театра Казахстана. У него много титулов, государственных наград, он востребован не только у себя на родине, но и по всему миру активно выступает на престижных концертных площадках с мировыми звездами, его часто приглашают на спектакли лучшие балетные труппы мира. Его репертуар отличается необычайной широтой, в котором органично соседствуют как образы голубых принцев, так и образы героев с глубокими внутренними переживаниями, образы героев своего времени [1, с. 16, 127, 229].

Основная часть. Первое время казалось, что его внешность не совсем соответствует благородным балетным героям, так называемой «голубой классики». Но, сегодня мы можем наблюдать, что современные танцовщики внесли свои коррективы в традиции исполнения и классических балетных образов. Они освободили своих принцев от преувеличенной, нарочитой галантности, а на первый план выносили гимн любви, которая не только побеждает препятствия, но преображает самого человека. Зигфрида и Альберта в исполнении Адамжана с уверенностью можно отнести именно к таким образам. Он в начале подчеркивал в своих героях не самые лучшие качества: юношескую беспечность – у Зигфрида, безрассудное легкомыслие – у Альберта. Именно это делало героев живыми и интересными, оттеняя последующее

преображение героев, когда все поверхностное и эгоистическое тонуло в море глубокого чувства. Такое прочтение образов поддерживалось и его партнерами в дуэте, создавая внутреннее единство [2, с. 64].

Адамжан – танцовщик современный, его современность выражается не только в пластике и энергетике его танца, а больше в глубине передаваемых личных переживаний, легко считываемых зрителями в зале. Стремительный мягкий прыжок – одно из ярких свойств танца Адамжана и наиболее яркое проявление его артистической индивидуальности. Не удивительно, что самой захватывающей его ролью остается Спартак. Хотя он исполнил много самых разных балетов, но в этом образе он наиболее органичен. Он удивляет не высотой взлета, а поражает органичностью и естественностью движения в воздухе. Его Спартак не выполняет сложные прыжки, а взмывает вверх, моменты парения кажутся необычайно протяженными и длительными. Естественность сложнейших танцевальных движений соединяется у артиста с органичностью всего его внутреннего состояния в этой роли. Танцовщик живет в музыке и танце, воплощая духовную свободу Спартака.

Роль Спартака в одноименном балете в постановке Юрия Григоровича является одним из образцовых балетов с выходом на первый план мужского танца. Благодаря тому, что балетмейстеру удалось отойти от бытового танца, заменив его обобщенным танцевальным образом, а дивертисментный танец – действенным, «Спартак» стал первым балетом, где поставлены танцы не по поводу восстания, а мы видим само восстание в танце. «Глубина раскрытия темы восстания гладиаторов в этом спектакле находится в прямой связи с необычайным обогащением и развитием мужского танца, никогда еще не игравшего в балете столь значительной роли и, не приобретавшего такого разнообразия и размаха. [3, с. 228].

Партия Спартака стала его первой большой ролью театре «Астана Опера», которая ознаменовала рождение нового премьера в плеяде казахстанских солистов балета. В истории национального балета ярким художественным открытием является Спартак в исполнении Рамазана Бапова, известного талантливого танцовщика, единственного в истории казахского балета, удостоенного звания Народного артиста СССР. По силе художественного перевоплощения его Спартак на казахской балетной сцене был никем не превзойден. После него были не менее талантливые исполнители, были и технически более сильные солисты, но добиться той планки в эмоциональном и техническом исполнении этого образа, к сожалению, никому в XX веке не удалось. На мой взгляд, исполнение Адамжаном образа Спартака многообещающе, в его творчестве можно заметить преемственность и развитие исполнительских традиций Бапова, который сам еще при жизни отмечал талант Бахтияра, символически подарив ему свои часы после одного из спектаклей с его участием.

Спартак в исполнении Б.Адамжана – борец за освобождение и в то же время зрелая личность, думающая о будущем своего народа. Особенно ярко и выпукло это раскрывалось в монологах Спартака, где он раскрывал внутренний мир своего героя, осознание в нем необходимости борьбы и принесения ради победы определенных жертв. Запоминающиеся большие прыжки по диагонали раскрывали бойцовский дух предводителя рабов, его готовность к борьбе и нацеленность на победу.

Огромный потенциал Б.Адамжана чувствовался еще в премьерных спектаклях, высокий стремительный прыжок с мягким приземлением нельзя было не заметить. Все большие прыжки, вращения молодой танцовщик выполнял широко, красиво, с размахом. В пластике танцовщика читалась строгая графичность и лаконичность. Убедителен он был и в дуэтных танцах со своей возлюбленной Фригией. Хорошо отрепетированные высокие поддержки и позы на полу выполнялись ими без труда, нигде не выходя из эмоционального состояния своих героев. В одном из монологов, когда его товарищи вручают Спартаку красную тогу, как символ вождя, танцовщик очень зримо показал преодоление его героем сомнений в правоте своих намерений. Танцуя, он как бы размышляет о своем долге перед народом, и в какой-то момент его герой приходит к твердому убеждению – пожертвовать всем, что у него есть и даже собственной жизнью во имя обретения свободы и победы. И этот кульминационный момент в танце Б.Адамжана читался очень ясно, менялись пластика, жесты и даже взгляд. С этого момента его движения обретали широту и размах, начинались большие прыжки и темпераментные вращения, давая действенный импульс роли.

Нельзя не отметить глубоко психологические дуэты Спартака и Фригии, выраженные в танцуемом ими адажио. Именно в дуэтах передана сложная гамма чувств, где в танце можно увидеть все – любовь и взаимное благоговение, горечь пережитых страданий, боль от

невозможности стать счастливыми. Пластический рисунок адажио изобилует сложными поддержками, изломанными линиями тел в сочетании с четкими классически правильными комбинациями движений. Танцевальный дуэт Б.Адамжана и М.Баспаевой смог воплотить ту сложную танцевальную ткань, заложенную балетмейстером в этом психологическом адажио.

Высшей точкой спектакля, его катарсисом становится смерть Спартака, воздетого высоко в воздухе на пики. Последовавшая за этим сцена реквиема, по пластике и образному строю представляется контрастной всем предыдущим сценам балета. Вся сцена представляет собой движение определенных смысловых символов, создаваемых посредством смены пластических групп, которые воспринимаются зрителями как скульптурные барельефы или мемориальные памятники. Если предыдущие сцены строились преимущественно на активно маршевых и прыжковых танцевальных сценах, то эта абсолютно статичная сцена приобретала значение некоего обобщения, общечеловеческой трагедии.

Сама сцена строится лишь на изменении композиции групп гладиаторов, высоко держащих тело Спартака, и плакальщиц в темно-серых хитонах. Их выход сопровождается живым хором, звуки которого несутся как будто издали, сверху. Движения плакальщиц построены на плавных переходах, они то садятся на колени, то встают, то поднимают руки, то опускают. Эти движения создают впечатление мирно вздымающихся волн. И финальная точка: высоко взнесенное тело Спартака, над ним простирается Фригия, как бы телом и руками накрывающая своего возлюбленного. Чуть ниже к Спартаку протягивается лесенка рук плакальщиц. Таким образом, пластической метафорой балетмейстер ставит свою точку в протесте против насилия и утверждении гуманизма.

Не менее интересным стало воплощение Адамжаном образа великого композитора всех времен и народов Людвиг Ван Бетховена. К 250-летию великого композитора Людвиг Ван Бетховена, юбилей которого отмечало все мировое сообщество, театр «Астана Опера» представил на своей сцене премьеру балета «Бетховен. Бессмертие. Любовь» в постановке немецкого хореографа Раймондо Ребекка. Хореограф выступил и в качестве автора либретто, создав обобщенную историю на основе некоторых фактов жизни композитора, которая была донесена до зрителя посредством пластики, пения и музыки.

Уходящие корнями в древнегреческую трагедию синтез танца, пения, инструментальной музыки и местами драмы, создал прецедент, направленный на то, чтобы удивить публику. Только в этом случае — это не серии сцен, смутно связанных и независимых друг от друга, а целая история о жизненном континууме творца [4]. Жизнь Бетховена, как известно из истории музыкального искусства и мемуарной литературы, не была простой и счастливой. На пути к славе и бессмертию ему пришлось постоянно преодолевать трудности: сложные взаимоотношения с семьей, бедное существование, отсутствие поддержки, неприятие высшего света, трагическая любовь, болезнь... И самое ужасное, что может случиться с музыкантом — абсолютная глухота. Хореографу удалось создать драматургический каркас балета, на который нанизывались наиболее значимые события из жизни композитора, раскрывавшиеся во взаимодействии с придуманными символическими образами.

Композиционно балет начинается со сцены похорон, где присутствуют представители как высшего общества, так и простолюдины, которых «изображает» хор. Спускающиеся с колосников светящиеся шары ассоциируются с планетарностью и светом таланта великого композитора. Здесь, по замыслу хореографа, вступают главные символические фигуры балета, сопровождавшие жизнь композитора. Болезнь, любовь к музыке и вдохновение в образе Эвтерпы и Бессмертная любовь. Бетховена символизирует рояль, к которому подносят цветы, где и происходит обряд прощания.

Картина «Болезнь» — одна из наиболее выразительных и запоминающихся сцен балета. Абстрактный костюм и фантастический головной убор, но при этом хорошо читаемый пластический рисунок образа, в котором хореограф пытается передать не действие, а состояние через ломаную пластику, рваные, иногда неуклюжие движения, в основном тянущиеся к земле, под синкопированную современную музыку с резонирующим акустическим ударом.

Многозначность и многослойность драматургического развития и образов балета, переданных через хореографическую пластику и рисунок, можно было наблюдать и в картине «Юный Людвиг». Картина рисует процесс обучения Бетховена музыке. Зритель видит строгого, временами жестокого отца, добрую мать, которая пыталась его оберегать, и двух младших братьев. Хореограф создает на сцене как бы три уровня действия: в глубине, в тени семья, в

центре Бетховен за инструментом с отцом и на переднем плане с двух сторон образы Эвтерпы и Болезни, которых видят только зрители.

Абстрактный символический образ, видимый только зрителям и ощущаемый Бетховеном, будто бы ведет композитора по жизни на протяжении всего спектакля. И, когда он оказывается перед выбором между Бессмертной Любовью и Эвтерпой, избранная им Муза музыки воспринимается как единственно правильное решение талантливого человека, обуреваемого жизненными страданиями и страшной болезнью. Партия Эвтерпы насыщена сложной вязью движений, разнообразными поддержками, где обязательно хорошее владение непростой техникой и интересными подходами к давно знакомым элементам классического танца.

Многозначность художественного замысла в прочтении жизни великого композитора и его окружения хореограф продемонстрировал и в картине «Венский бал». Уходящие в глубь мраморно-белые падуго, хрустальные люстры, прозрачный рояль, стеклянные столик и стулья создают иллюзию блестящего венского общества, где все призрачно, притворство и обман. Зритель понимает это по костюмам и маскам, в которые художником одеты представители аристократии. Затянутые белоснежные корсеты, золотистые маски на пол лица, воздушные шары, летящая тюль – все подчеркивает непостоянство, неестественность и пресыщенность высшего света. Хореограф добавляет в их танец выразительную пантомиму, гримасы, элементы эстрадного танца с вихляниями бедер и даже голосовые звуки.

Бетховена хорошо принимают в светском обществе, восторгаются его талантом, но ему одиноко и неуютно среди них. Он стремится к творческому самовыражению и, как каждый мужчина, жаждет любви женщины. По замыслу хореографа, именно в этот момент в его жизнь входит женщина в образе Бесконечной Любви. Бетховен исполняет свое новое сочинение – знаменитую «Лунную сонату», и в танец с ним вступает Любовь. Его, Гайдна и Моцарта, знаковых композиторов той эпохи, охватывает Вдохновение. Великие композиторы вступают в танец, выходя из рамок портретов, размещенных на сцене.

Развязкой балета, на мой взгляд, является начало второго акта, когда Бетховену предстоит выбор между Любовью и служением искусству. Дуэт с Любовью построен как красивое адажио с высокими поддержками, летящими позами, гармонично вытекающими движениями, с красивыми связками и непрерывным легато как в музыке, так и в пластике. В первом составе партию Бесконечной любви воплотила ведущая солистка труппы Айгерим Бекетаева. В ее исполнении символический образ наполнился смыслом и высокой одухотворенностью. Удлиненные линии тела, певучие руки, протяжные вынимания ног и невероятные дуэтные поддержки – все то, чем Бекетаева очаровывает зрителей всегда, переливалось всеми гранями в дуэте с Бетховеном. Заключительный дуэт с Любовью – наиболее эмоциональный по накалу, в чем-то даже патетичный, так как звучит как гимн в честь любви и красоты. Роль Бетховена Адамжан приблизил к героям, в которых всегда наиболее интересен, герои-философы, терзающиеся сомнениями и всегда стоящие на пороге выбора в своей жизни.

Затем в дуэт вступает Эвтерпа. В хореографическом трио Бетховен мечется между ними, разрываясь между любовной страстью и преклонением вечной музыке. Он выбирает искусство и следующее за ним одиночество. Понятный художественный подтекст балета живописно раскрывается через многозначную метафоричную сценографию и не менее выразительную пластическую речь.

В первом составе талантливым интерпретатором хореографии Ребекка стал премьер балетной труппы Бахтияр Адамжан. Его Бетховен воспринимается как зрелая личность, неустойчивый в искусстве, но ранимый и, порой, беззащитный в жизни. Танцовщик крупными мазками рисует образ композитора, демонстрируя своим танцем, как его героя раздирают сомнения в жизненном выборе и предназначении, как страдания и болезни преодолевают его человеческую сущность и плоть. Блестящая техника и головокружительные вращения любимого всеми солиста театра в этой партии отходят на второй план. Безупречная техника и выразительная пластика лишь дополняют образ неистового художника, подарившего миру бессмертную музыку.

Заключение. Бахтияр Адамжан создает образ через пластически выразительные позы и жесты, в каждом из которых зритель может считывать его внутренние переживания. Непростой задачей было создать сам пластический язык великого композитора, который создавал бессмертную музыку, но при этом сам не мог ее слушать. Ему трудно было общаться

с людьми, большинство считали его высокомерным и нелюдимым, а он просто не слышал их и, соответственно, не мог реагировать. По замыслу хореографа композитора постоянно одолевают терзания и выбор, выбор между любовью и вдохновением, выбор между высшим светом и полным погружением в творчество. Своеобразным лейтмотивом образа и становится разрыв композитора между долгом и обязанностью по отношению к семье и служению музыке.

Если в романтических сценах с Любовью преобладают певучие позы, то в сценах, связанных с творчеством – полетные прыжки, пересекающие сцену. Эти прыжки соединяются с различными турами – и все вместе создает представление о взволнованном душевном состоянии героя. И далее, пластический рисунок строится на элементах современной хореографии, которые наиболее ярко отражают метания и душевные переживания героя. Адамжан одинаково гармоничен как в классической, так и современной хореографии.

Адамжан – танцовщик, подкупающий непосредственностью, искренностью сценического поведения. Танец для него – не набор технических движений, а выражение внутренней жизни, сфера проявления человеческих чувств. В его танце меньше всего чувствуется исполнение заданных комбинаций – это живая пластическая речь. Именно эти качества и привлекают хореографов для работы с Адамжаном, где они выбирают его для воплощения неординарных образов, сложных не только по хореографической лексике, но в первую очередь, там, где нужна актерская игра и ярко выраженная индивидуальность.

Список использованной литературы

1. *Choreographic art of Kazakhstan. Encyclopedia. Astana, Kaz.national Academy of Choreography 2023. - 654 p. (опубликовано на 3-х языках)*
2. *Steppe enchanted by dance: Essays and essays. Comp. D.Scale. – Almaty: SaGa, 2011. – 284 p. (опубликовано на рус.языке).*
3. *Vanslov V. Grigorovich's ballets and problems of choreography. Moscow: Iskusstvo, 1971. (опубликовано на рус.языке).*
4. *Moldalim Togzhan "Ballet "Beethoven — Immortality — Love"// Qazaq Ballet Magazine Publication date August 3, 2021, www.qazaqballet.kz/main_articles/balet-bethoven-bessmertie-ljubov/ (опубликовано на рус.языке).*

Chemical sciences

STUDY OF THERMAL STABILITY OF METAL SOAPS SYNTHESIZED FROM SOY WAX

Roman Manar Hasanov
Sabir Qarash Amirov
Rasmiyya Elbrus Mammadova
Zumrud Davud Aliyeva

Azerbaijan State Oil and Industry University

Abstract

Calcium (Ca) and aluminum (Al) soaps were synthesized based on soybean wax. Ca soap (CaSO) of soybean wax is a hygroscopic compound. After washing and drying, it took on an oily white-yellowish form. Al soaps (ALSO) are not hygroscopic, unlike CaSO, and it is difficult to remove impurities from their composition by washing. Thermogravimetric and differential thermal analysis (TG-DTA) methods were used to study the thermal stability of these soaps. While ALSO loses 4.18% of its mass at 124.2° C, CaSO loses 1.02% of its mass at 120° C. Up to 300° C, CaSO loses 8.46% of its mass, while ALSO loses 21% of its mass. This indicates that the thermal stability of CaSO is higher than that of ALSO.

Introduction

Soy wax is a solid fat obtained by partially or fully hydrogenating soybean oil. It consists of triglycerides of the main saturated carboxylic acids (palmitic, stearic). The main applications of soy wax are candle making, the cosmetics industry, and the production of a number of components. Its annual production volume was 432 million tons in 2020 [1-3].

The fact that soy wax is obtained directly from soybean oil, which is a vegetable oil, makes it an environmentally friendly and renewable raw material. It is easily decomposed in nature, is non-toxic, and offers promising alternatives in the synthesis of many compounds. One of these is the synthesis of metal soaps. Finding non-petroleum-based, environmentally friendly raw materials for the synthesis of metal soaps, which are used for many purposes in industry, is a pressing issue. Many studies have been conducted on the synthesis of metal soaps, which are used as additives in many industries, from vegetable oils. For this purpose, the properties of metal soaps synthesized from the oil of *Ximenia Americana* and *Balanits aegyptiaca* seeds have been studied. During the study of the thermal stability of metal soaps, it was determined that the thermal stability of metal soaps synthesized from unsaturated vegetable oil are lower than the saturated soaps of the corresponding metals [4]. This can lead to a number of problems when using these compounds as additives in industry. For this purpose, calcium and aluminum soaps were synthesized based on soy paraffin as a thermostabilizer component for polyvinyl chloride and their thermal stability was studied using the TGA method.

Synthesis of metal soaps

To synthesize soaps, soluble soaps of soy wax were first synthesized then calcium and aluminum soaps were obtained by metathesis of these soluble soaps [5]. To synthesize water-soluble soaps from soy paraffin, a slightly more than stoichiometric amount of alkali solution in alcohol was added to a certain amount of melted soy paraffin and mixed. After heating and mixing for one hour, water was added to the reaction mixture and diluted, and soaps of the corresponding metals were obtained by adding $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ and $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ solutions to the soap dissolved in water. After washing and drying the metal soaps, they were tested in a thermogravimeter at a heating rate of 30° C/min in an N_2 atmosphere.

Thermal stability of synthesized metal soaps

The stability of metal soaps synthesized from soy wax depends strongly on the type of metal. ALSO loses 4.18% of its mass at 124.2° C, while CaSO undergoes a 1.02% mass loss at 120° C. This mass loss, which occurs at relatively low temperatures, is due to the moisture content of the metal soaps. When the temperature reaches 250° C, the mass of ALSO decreases by 9.9%. In CaSO, a corresponding mass loss is observed at 320° C (10.36%). The TG-DTA curves for CaSO and ALSO are given in Figure 1-2, respectively.

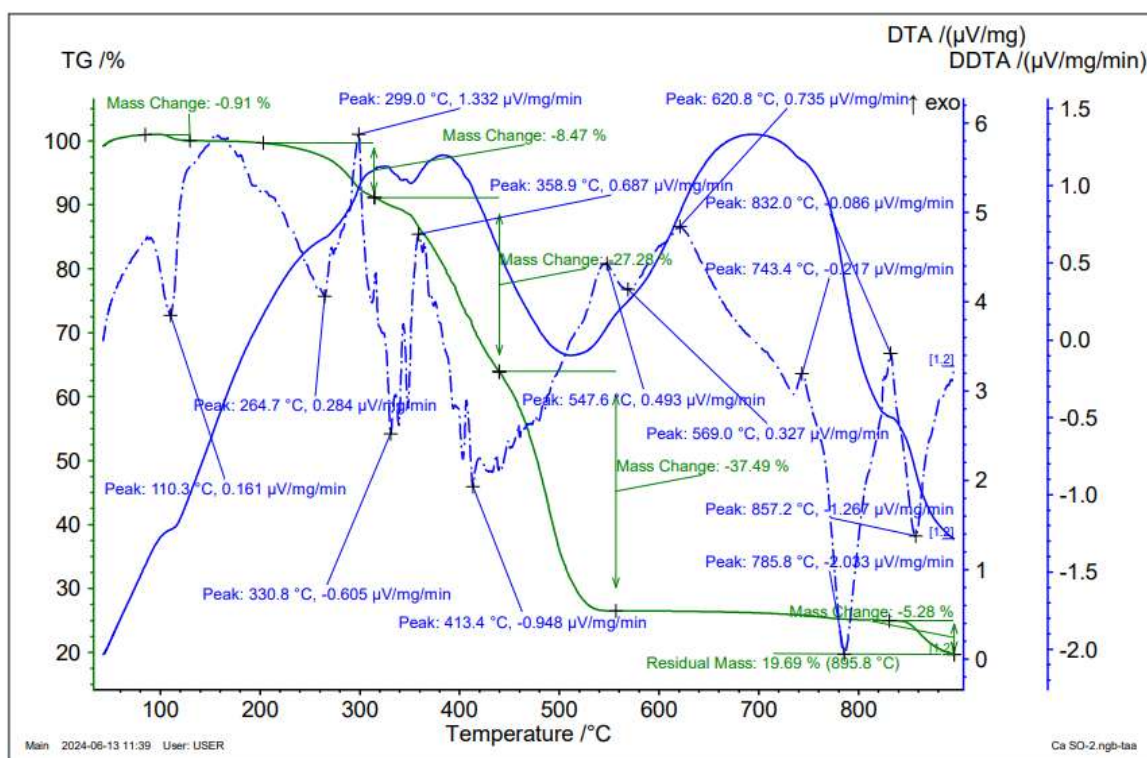


Figure 1. TG-DTA curves of CaSO

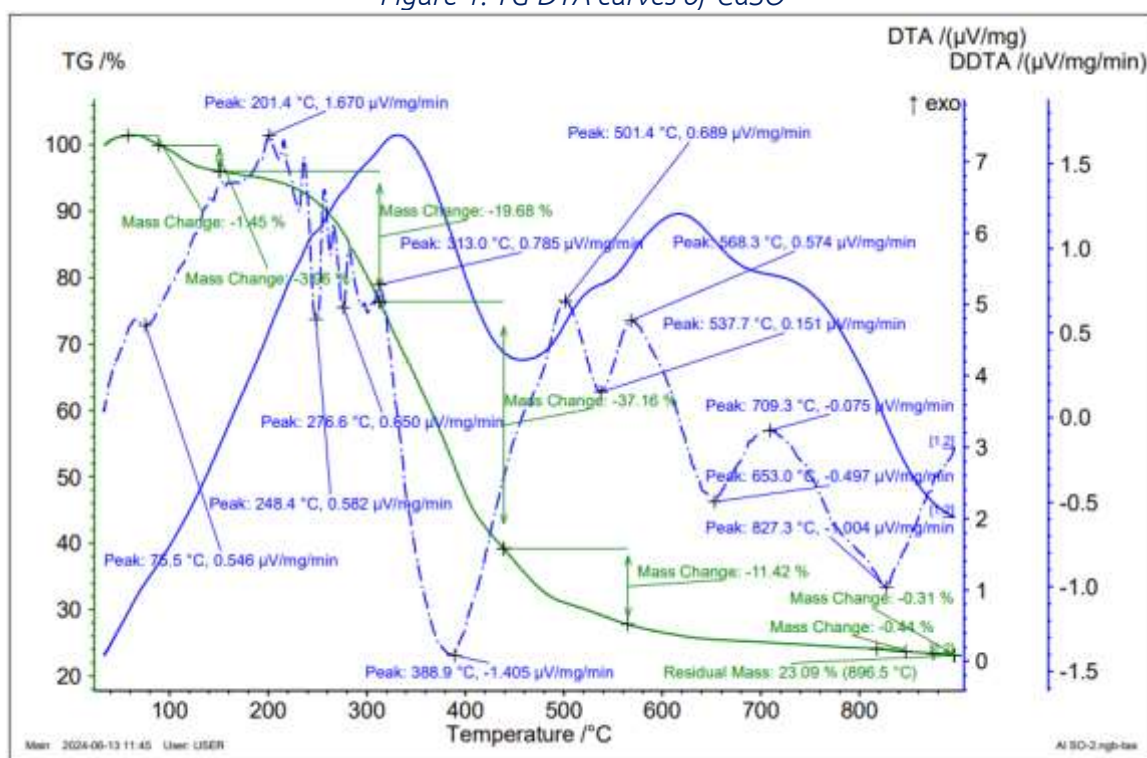


Figure 2. TG-DTA curves of AlSO

In the next stages of heating, the decomposition intensifies and at 400° C AlSO has already lost 53.28% of its mass. In CaSO, 52.69% mass loss occurred at 480° C. Taking into account these results, it can be said that Ca soaps synthesized on the basis of soy paraffin are thermally more stable than Al soaps. This can be understood more clearly by comparing the graphs presented in Figure 3.

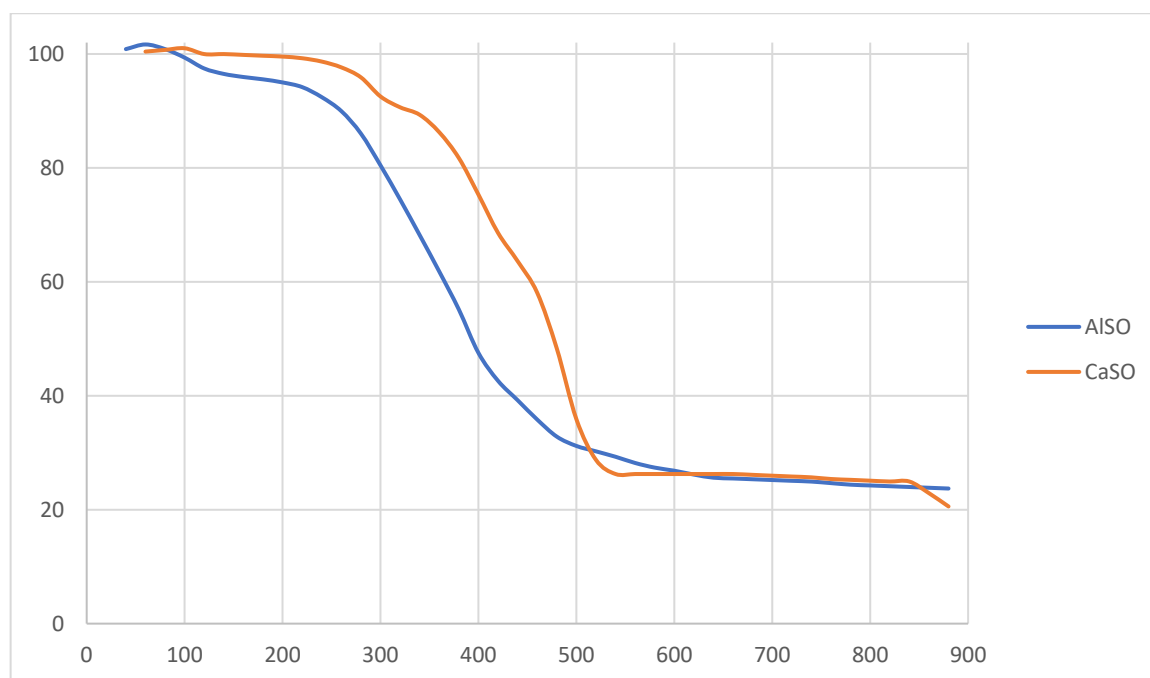


Figure 3. Comparison of ALSO and CaSO thermograms

A comparison of the thermal stabilities of divalent and trivalent metal soy paraffin-based soaps shows that decomposition in both metal soaps intensifies above 200°C. This suggests that these components do not decompose under the processing conditions of polyvinyl chloride and can be used as polymer additives.

Conclusion

Calcium and aluminum soaps were synthesized based on soy wax and their thermal stability was studied. A significant mass loss is observed in both metal soaps above 200° C. From the comparison of the soaps, it was found that the thermal stability of calcium soaps is better than that of aluminum soaps. Since both metal soaps were studied as polymer additives, their thermal properties allow them to be used as polymer additives according to the polymer processing conditions.

References

1. Athira Nair Surendran, Kameswara Pavan Kumar Ajjarapu (2020). Characterization of industry grade soybean wax for potential applications in natural fiber reinforced composite (NFRC) filaments. *Industrial Crops and Products*, 186, 115163. <https://doi.org/10.1016/j.indcrop.2022.115163>
2. Zainal Arifin, Bhimo Ageng Tribhuwana (2022). The Effect of Soybean Wax as a Phase Change Material on the Cooling Performance of Photovoltaic Solar Panel. *International Journal of Heat and Technology*, 40(1), 326-332. <https://doi.org/10.18280/ijht.400139>
3. K. Rezaei, T. Wang and L.A. Johnson (2002), Hydrogenated vegetable oils as candle wax. *J Amer Oil Chem Soc*, 79, 1241-1247. <https://doi.org/10.1007/s11746-002-0634-z>
4. O.M. Folarin, I.C. Eromosele, C.O. Eromosele (2011). Relative thermal stability of metal soaps of *Ximenia Americana* and *Balanits aegyptiaca* seed oils. *Scientific Research and Essays*, 6(9), 1922-1927. <https://doi.org/10.5897/SRE10.438>
5. Lienda A. Handojo, Antonius Indarto, Dian Shofinita (2018). Calcium soap from palm fatty acid distillate (PFAD) for ruminant feed: quality of calcium source. *MATEC Web of Conferences*, 156, 02007. <https://doi.org/10.1051/mateconf/201815602007>

Historical sciences

THE RESETTLEMENT OF ARMENIANS AND OTHER PEOPLES TO THE SOUTH CAUCASUS AS PART OF POLITICAL PROCESSES

Bahramova Sevil Shivakhan

Azerbaijan State Pedagogical University

Head teacher of the Faculty of History and Geography,

PhD in History

<https://orcid.org/0000-0002-4886-0101>

Abstract

The Caucasus is distinguished by its diverse ethnic map and the abundance of very diverse cultures with a rich historical past. Here, various ethnic cultures have interacted for centuries, forming a special cultural phenomenon of the Caucasus. For centuries, the Caucasus has attracted the attention of Europeans with its rich natural resources, historical and cultural heritage, and ethnographic diversity. Very favorable conditions have been created in the region for socio-economic development, preservation of ethnocultural identity, ethnocultural values, and ethnographic features, and European ethnic communities have formed here throughout the 19th and early 20th centuries. This began to manifest itself more clearly at the beginning of the 20th century, as the resettlement policy of Russian tsarism and the ethnodemographic changes that led to them in the Caucasus. The conquest of the Caucasus by the Russian Empire marked the beginning of new ethnosocial processes and changes in the ethnodemographic structure of the region.

At the beginning of the 19th and 20th centuries, migration processes in the Caucasus, both outside the borders of the Russian Empire and from its then remote and internal provinces, took place. Migration processes in the Caucasus in the 19th century were purposeful within the framework of the resettlement policy of tsarism and occurred not only voluntarily, but also forcibly. The article reflects the policy of resettlement of the population of Russia to the South Caucasus, and various sources are analyzed.

Keywords: South Caucasus, heretics and sectarians, forced resettlement, colonial policy, ethnocultural values, ethnographic features, ethnic communities, mass migration of the population.

The study of various aspects of the history of the population of all regions of the Caucasus, including our cities with large settlements, is currently of great scientific and political relevance. With the collapse of the USSR, when political and ideological prohibitions were lifted, the need to rework many problems and topics studied during the Soviet Empire has arisen. Seeing the seriousness of the problem before anyone else, the National Leader Heydar Aliyev, at a meeting with leading scientists of the Azerbaijan National Academy of Sciences in the late 90s of the last century, set the objective study of the history of Azerbaijan of the 19th-20th centuries as one of the priority tasks for historical science. Following the recommendations of the National Leader, our historians have been doing serious work in recent years to fulfill this task. We believe that in terms of fulfilling this task, the study of the ethnic and social composition of the population living in Baku in the 19th-early 20th centuries is of great relevance. It is known that Baku became the largest industrial center not only of Azerbaijan but of the entire Caucasus at the end of the 19th and beginning of the 20th centuries (5, p. 154). This was accompanied by a rapid increase in the population of the city, as well as serious changes in its ethnic and social composition. These changes, which were the result of the purposeful policy implemented by the tsarist government, were not in the best interests of the local Azerbaijanis. This led to the emergence of unfounded claims in the future regarding the issue of the belonging of the city of Baku. The chosen topic is of particular relevance in terms of exposing the fact that these claims have no historical basis. In fact, the ethnic and social composition of the population living in Baku, and in Azerbaijan in general, at the beginning of the 19th-20th centuries, was poorly and one-sidedly studied in Azerbaijani historiography. However, sufficient material necessary for the study of this problem is concentrated in published sources and archival documents. This material is of great importance in terms of clarifying the reasons leading

to the increase in the population living in Azerbaijan, changes in its ethnic and social composition, and creating a holistic picture of the demographic situation of the city within the chronological framework of the research work. The special relevance of the study of the chosen topic is also that the systematic, dynamic study of the process of Baku's transformation from an Azerbaijani city into a multinational city is of great scientific, political and practical importance. In the study, the role of migration processes, economic development and bourgeois reforms in changing the number and national composition of the Azerbaijani population also remains one of the relevant scientific tasks. Thus, the study of factors affecting the number of the population provides a basis for studying the causes of the processes occurring in the number of the population and its social composition.

As is known, the colonial policy carried out during the period of Azerbaijan's being part of the Russian Empire at the beginning of the 19th-20th centuries was manifested not only in the change in the ethnic composition of the population, but also in the transformation of the local Azerbaijani population into "second-class citizens" in their native city. As a result of this policy, the local population was deprived of the opportunity to hold any position in the city administration, and its opportunities to use the services of medical and educational institutions were significantly limited. However, in Baku, as well as in other cities of Azerbaijan, only the Christian population, primarily Armenians and Russians, who were settled at the beginning of the 19th-20th centuries, had great privileges. The investigation and disclosure of sources reflecting all these issues is of great scientific importance in terms of creating an objective picture of the demographic processes taking place in Azerbaijan during the period under study. This is also a coherent response to the desire of the tsarist government to try to separate Baku from Azerbaijan by using the situation created at the beginning of the 19th-20th centuries. The historical-demographic study of the resettlement of the population to Azerbaijan is also of great importance in terms of studying the geographical, cultural and political history of our country. The study of this topic is also relevant in terms of determining the place of Azerbaijanis in historical processes.

In his work on the Jar-Balakan communities, Petrushevsky not only provided extensive statistical information, but also described in detail the struggle for freedom waged by the Jar-Balakan people against the Russian colonialists, and even expressed his open sympathy for this struggle. The same ideas can be based on the books "History of Azerbaijan" published by Rashid Bey Ismayilov in Baku in 1923 and "Concise History of Azerbaijan" published by Jahangir Zeynaloglu in Ankara in 1924. However, it should also be noted that the aforementioned book by Rashid Bey was kept secret behind the walls of the archives for many years. The re-publication of both books in Baku is commendable (8, pp. 380-390).

The ruthless policy of occupation, forced displacement and colonization carried out by Tsarist Russia was exposed and sharply criticized in articles and books published in the late 80s and early 90s, and the activities of Armenian politicians who were active assistants of Tsarism in this work were widely commented on (11, pp. 22-35).

Iranian historian Nasir Najmi's work "Abbas Mirza" is one of the important sources for tracing the activities of Abbas Mirza, the main participant in the events, which remain unknown to us, and is an indispensable source for studying Iran's position at that time. In that work, the occupation policy pursued by Tsarist Russia in the east is sharply criticized. Professor Nazim Akhundov translated the book from Persian and prepared it for publication. It should be noted that he is also one of the main compilers of the books "Karabaghname".

In the Azerbaijani history books published in 1992-1995, a special place was devoted to the occupation of Northern Azerbaijan by Tsarist Russia, the resettlement by Russia, the commandant administration, and the people's struggle against colonial oppression. According to M. Ismayilov, while discussing the occupation and resettlement in those books, the occupation of Northern Azerbaijan by Russia was the most reactionary event (3, p. 23).

According to the decree of Tsar Nicholas I dated December 14, 1846, new changes were made to the administrative-territorial division of the South Caucasus. The territory was divided into the Tiflis, Kutaisi, Shamakhi, and Derbent governorates. The districts that were part of the Caspian region remained part of the Shamakhi governorate, and the Kubinsky district remained part of the Derbent governorate. After the center of the Shamakhi governorate was moved to Baku, this governorate was renamed Baku as a result of the 1859 earthquake. In 1860, the Derbent governorate was abolished and the Kubinsky district was included in the Baku governorate.

In December 1867, with the establishment of the Elizavetopol (Ganja) governorate, the Shusha and Nukha districts were removed from the Baku governorate and transferred to the Elizavetopol governorate. Due to the reduction in the territories of the districts, the Javad and Goychay districts were established on the territory of the Baku governorate based on the same decree. From that time on, the

Baku governorate consisted of 6 districts (Baku, Shamakhi, Kubinsky, Lankaran, Javad and Goychay) and a number of islands in the Caspian Sea. This division remained during the ADR period (1, p. 124).

Armenians, who pursued only their own interests and resorted to lies, fraud and all kinds of means to achieve their goals, brought trouble to the South Caucasus. They further intensified national and religious contradictions. The creation of a region for Armenians led to the emergence of similar desires among other peoples. Tsarism was interested in creating stability in the territories under its control. Therefore, the government took a number of measures to improve the management of the region.

In the middle of the 19th century, the so-called "Eastern Question" became acute again. In fact, it was a question of dismembering the Ottoman state, creating new states on its territory, seizing its lands, gaining access to warm seas, a question of benefit and hatred. If humanity were the main criterion for European states, then they should have protected the Muslim people oppressed under the yoke of tsarism and the Christians who opposed the rule of the autocracy. However, the great powers did nothing in this direction. They again began to use the Christian people living in the territory of the Ottoman Empire to implement their intentions. Tsarism sought to control the Balkans in the west and the North Caucasus in the east, and therefore brought the Christian factor to the fore. These claims again led to the Crimean War between the Russian and Ottoman Empires in 1853-1856, in which the Turks won. European states did not want Russia to win. Armenians living in Ottoman territory helped Tsarism (12, p. 48).

After the war, the settlement of Armenians in the South Caucasus continued. This time, preference was given to the Iravan governorate. The report of the military governor of the Iravan governorate dated November 5, 1850, noted that only 217,234 people lived in the governorate. The number of Azerbaijanis and Armenians was approximately the same. The attitude of the local population to the settlement of Armenians was negative. The colonial policy caused sharp protests from the Azerbaijanis. The local population expressed its attitude to the colonial policy of tsarism in active and passive forms. Rebellions, the Gachaga movement, etc. became active forms of resistance to colonialism (16). A similar situation arose in other parts of Northern Azerbaijan. The population was massively displaced from the Karabakh, Iravan and Baku khanates. Muslims who moved to the territory of the Omani state in the South Caucasus were concerned about the tsarist patronage of Armenians and at the same time their free settlement in Ottoman territory. The settlement of Muslims from Russia by the Ottoman government in the Zeytun region angered the Armenians. This area became one of the centers of propaganda among both Turkish Armenians and Armenians of the South Caucasus. As a result, a certain Armenian named Hovagim tried to incite the Armenians to revolt against the Ottoman state. In 1862, a revolt broke out (15, p. 315).

The Ottoman government sent troops to suppress the uprising. One of the leaders of the uprising, Levon III, went from Istanbul to Paris to meet with Napoleon and convince him to influence the Ottoman government to withdraw its armed forces. After the uprising was suppressed, the Ottoman government withdrew its troops. The Armenians, who celebrated this event as their victory, began to conduct extensive propaganda in Russia and the Ottoman state. The Armenians viewed the withdrawal of troops as a weakness of the government. In fact, the Ottoman government, due to its trusting attitude towards the Armenians, had very little control over these territories and sometimes simply did not have sufficient information about the situation on the ground. As the ground for the Armenian uprisings against the Ottoman government grew, the resettlement of Muslims from the North Caucasus and their settlement in the territories of the Ottoman state increased even more. In 1865, 400 people from the Kuban moved to the territory of the Ottoman state. The demographic situation of the population in this area changed. In the 60s and 70s, about 500 thousand refugees from the North Caucasus were resettled to these territories. It was located in the territory of the Ottoman Empire in the 19th century. Muslims who were forced to leave their historical lands, homes, and properties and move to the territory of the Ottoman Empire were very worried when they saw the shameless behavior of the Armenians here (7, p. 74).

In the second half of the 19th century, the migration of Armenians to Northern Azerbaijan increased sharply. This was prompted by the Crimean War of 1853-1856 and then the Russian-Ottoman War of 1877-1878. According to data from 1873, there were 221,191 Armenians; in 1886, their number was even higher - 375,700; in 1897, there were already 439,926 Armenians. At the beginning of the 20th century, the number of Armenians in the province continued to grow. In 1917, this figure was 669,871 people. A comparison of these data with the indicators of 1897 shows that over the past 20 years the number of Armenians here has increased by 229 thousand 945 people or 34.3%. A similar picture was observed in the Yelizavetpol governorate. In 1873, there were 99,918 Armenians. In 1886, that is, 13 years later - 258,324, and in 1897 there were already 292,188 Armenians (6, p. 9).

Compared to 1886, their number was 33,864 more people. At the beginning of the 20th century, 418,859 people or 32% of the local population lived in the province. In 1873, 13,133 Armenians lived

here, and in 1886, 56,591, or about 8% of the local population. Compared to 1873, that is, in 13 years, their number increased by 43,458 people.

If in 1828-1829 there were 22,500 Armenians living in the former Iravan Khanate, in the following two years their number almost tripled and reached 64,450,195. The Ordubad region, that is, the former Azerbaijani Iravan and Nakhchivan lands, khanates indicate that Azerbaijanis previously ruled here. After the mass resettlement of Armenians from the Qajar and Ottoman empires, their number increased sharply and reached 81,610. Thus, 1,050 families settled in the Borchali district of Georgia, 67 families in the Pambak district, a total of more than 5,580 people. As a result, demographic changes took place in Northern Azerbaijan, especially in the Karabakh province. In 1823, there were 4,366 or about 22 thousand Armenian families. Some Armenian families tried to migrate to the Qajar and Ottoman states again, and the official representative of the Russian government, P.V. Gan, in his memoirs, noted that he asked Emperor Nicholas I to stop this migration. Thus, from the very beginning, the increase in the Armenian population in Northern Azerbaijan occurred due to mechanical movement. The increase in the number of Armenians was always due to the resettlement of Armenians from other territories (4, p. 212).

In the second half of the 20th century, Armenians already made up 67.4% of the population of the Iravan province, whereas previously the overwhelming majority here were Azerbaijanis. The settlement of Armenians was a system of colonization of territories captured by force of arms of the military-political and trade-economic doctrine of Russia.

In the years following the Russo-Ottoman war of 1828-1829, more than 100 thousand Armenians moved from the Ottoman Empire to the territory of Azerbaijan occupied by Russia. "Since then, the gradual resettlement of Armenians from the Muslim states to the South Caucasus, as well as to Azerbaijan, has continued uninterruptedly, then with difficulty, in the last few years, with a wide, rapid flow, with a noticeable trickle, each war with the Ottomans or Qajar gave us tens of thousands of Armenians" (5, p. 21).

Thus, until the 19th century, the number of Armenians in the Caucasus was so insignificant that Caucasian scholars paid attention to them and began to keep records of the number of Armenians only after the Russian Empire occupied the South Caucasus, that is, after it was occupied by the Russian Empire. The end of the Russo-Qajar War of 1826-1828 and the Russo-Ottoman War of 1828-1829 did not have a noticeable impact on the ethno-confessional and demographic structure of the Caucasus, where the majority of people were Muslims. Only after the Russian Empire captured the Caucasus, including its southern part, did the Armenian influx become significant, with the understanding and comprehensive support of the Russian authorities, who wanted to Christianize the occupied Muslim lands.

The book "History of the City of Derbent" (1906), prepared on the occasion of the 100th anniversary of the occupation of Derbent, provides interesting information about the ethnic affiliation of the population living in the city, the history of settlement in this city, and the character traits. Armenians continued to come to Derbent in subsequent years, for example, in 1871, 16 Armenians, most of whom were craftsmen, moved to Derbent from the Qajar state. The tsarist government, taking into account the strategic position of the city of Derbent, tried to accommodate more Christian-Slavic national-religious elements here, and the process intensified after the end of the Caucasian War (1864) (16). According to information from 1895, 1,000 Armenians lived in the Derbent province, most of whom lived in cities and were engaged in trade. The Jewish population of the city of Derbent settled here in 1797. That year, the ruler of Qazigumukh, Surkhay Khan, marched on the lands of his enemy Shikhali Khan in Derbent. Although he could not enter Derbent, he destroyed the village of Abbasoba, located 7 km south of it, inhabited by Mountain Jews, killed more than 200 people, and took many of them captive. Shikhali Khan settled the 150 survivors in the city of Derbent. The new residents were settled in the previously uninhabited lower part of the city, in the area called Dubari. According to legend, the Jews brought soil from the village of Abbasabad, spread it on the ground where they would build their houses, and then built their houses. The new neighborhood that emerged was called the Juhud (or Yehudi) neighborhood. In 1806, 100 male Jews lived in Derbent, and according to the results of the First All-Russian Census of 1897, their number had reached 1,117. Y. Kozubsky also provides extensive and interesting information about the Jews living in Derbent, stating that the people living there are mountain Jews and that European Jews have recently begun to appear here, especially after the development of the fishing industry. Although the mountain Jews were allowed to go to Astrakhan twice a year to trade like other merchants by the Emperor's decree dated August 25, 1850, their appeals to the Emperor in 1887 to obtain passports like other Jews and live freely anywhere in the empire remained unanswered (3, p. 18).

Y. Kozubski states that the Tats living in Derbent and its surroundings were moved there by the Qajar shahs, that the name Tat is not related to ethnicity, but to their lifestyle and social status, and that in the Chagatai dialect of the Turkic language this word means subjects, those who live with the nobility and serve them. According to Y. Kozubski, the Turkic tribes, who were proud of their nomadic nature, called the sedentary population living in the territories they subdued tat. The Turkic-Tatar tribes living in Transcaucasia, especially on the Caspian coast, mixed with the local population and lost their Mongoloid type. The western branch of the Turkic language spoken by them was also influenced by the Arabic and Persian languages, took on a soft and fluent pronunciation, lost many ancient Turkic words, and was enriched and stabilized at the expense of these languages. The language spoken by the people of Derbent is also a dialect with its own unique shades of this language. V. Legkobitov, who compiled the Cameral description of the Derbent province in 1831, wrote that the Tatar language is also a means of communication for other peoples who have their own language, including Armenians and Jews. The Derbent people differ little from other Muslims living in cities on the other side of the Caucasus, especially the Baku people, and apparently have the same origin with them. They are sharply distinguished by their appearance from the neighboring mountain peoples, and it is easy to choose any mountaineer among the Derbent people. They are sociable, sociable and inclined to accept useful innovations. Thanks to the privileges and support they received in exchange for loyal service to the empire, the Armenian bourgeoisie of Georgia gradually acquired a significant part of the property of the Georgian feudal aristocracy and took a dominant position in the cities, especially in Tbilisi. This situation was reflected in official documents of that time, as well as in journalistic, artistic and generally literary sources. For example, in 1874, S. Meskhi wrote in the newspaper "Droeba": "Today, Armenian merchants play a leading role in the commercial life of Tbilisi; they own a large part of the real estate. If you meet one or two Imerets or Magrells anywhere, it is among officials and generally small merchants and owners... Out of 72 city deputies, only three or four are Georgians... One or two Russians and one German, the rest are all Armenians". According to the calculations of Armenian historians, more than 60% of Tbilisi's commercial and industrial enterprises belonged to Armenian capitalists. At least one fact is that the government's support for the Armenian bourgeoisie from the very beginning took on such a scale that the reins of economic life soon fell into the hands of Armenian merchants and Russian capital (2, p. 124).

General Shirinkin, the deputy police officer of the Vice-Chancellor of the Caucasus Vorontsov Dashkov (1905-1915), openly stated that in the new conditions the only people who would play the role of a base for Russia in the South Caucasus were the Armenians. Taking into account the created political situation, its implementation seemed more promising for them, against the background of the widespread propaganda of the stories of Khorenats, Sebeos and Draskhanakerts glorifying the Armenians, by falsifying the facts of the history and culture of Georgia. In the 19th-20th centuries, Russian and Armenian historiography tried to rewrite the history of the Caucasus in a way that suited their interests, while minimizing the importance of the history and culture of Georgia.

The goal of the policy pursued by tsarism in the South Caucasus, both in Azerbaijan and in Georgia, was to create ethnic division. During the reign of tsarism, the demographic structure of the South Caucasus, both in Azerbaijan and in Georgia, changed significantly. N.I. Shavrov wrote in 1911: "Of the 1 million 300 thousand Armenians currently living in Transcaucasia, more than 1 million do not belong to the indigenous population of the region and were resettled by us" (17).

In the 19th century, a search began for methods of organizing the administration of Transcaucasia as a whole. The activities of government commissions and officials in this direction culminated in the adoption of the "Institute for Administering the Transcaucasia Province" in 1840. Changes in the administration of the South Caucasus could be implemented in one of the following directions:

a) The system of administration and legal status of the population of Transcaucasia remained unchanged;

b) Transcaucasia was to receive the status of the "richest colony" of Russia;

c) The central part of Transcaucasia was "united" with the Russian Empire through the introduction of unified administrative bodies with governorates (14, p. 111).

As a result, the South Caucasus acquired a new legal status within the Russian Empire in the 19th century. The South Caucasus began to take shape as an integral part of Russia. This required the administrative reform carried out in 1840. Its goal was to create a single executive system common to all provinces of the Russian Empire. At the turn of the 19th and 20th centuries, the settlement of Armenians in Georgia reached its maximum. Over five years (1897-1902), about 55 thousand Armenians arrived in Georgia, most of whom settled in Tbilisi, Batumi, Gori, Sukhumi and the villages of Abkhazia. In Tbilisi alone, the number of Armenians increased from 46.7 thousand to 124.9 thousand people in

1897-1910, of which 68 thousand were mainly newcomers from the Ottoman Empire. The aggressive nature of the demographic policy of tsarism was manifested in the fact that the settlement of Armenians in border regions, for example, in Samtskhe-Javakheti, was accompanied by the persecution of the Georgian population. According to L. Zagursky, "the country seemed to be inhabited by Armenians from the very beginning, although by 1828 it was 90% Georgian" (17).

The most numerous category of the Polish population in the North Caucasus were exiled Poles - participants in the national uprisings in Poland in the 1830s-1860s. Despite the amnesty declared by the tsarist government after the suppression of the Polish uprising in 1830-1831, hundreds of convicts were exiled to Siberia, recruited as soldiers and resettled in remote provinces of Russia, including the Caucasus (9, p. 65). In the 1830s, a mass influx of exiled Poles to the Caucasus began. The same thing happened after the defeat of the uprising of 1863-1864. Thus, from the end of the 18th century to the mid-1860s, the Polish ethnic community in the Caucasus was formed mainly from exiles (participants in the Polish uprisings) and military personnel of Polish origin sent to the region. Although some of the exiles returned to their homeland after the amnesty was declared, many Poles remained here forever after completing their military service or going into exile.

Polish soldiers and exiles were stationed throughout the Caucasus. In particular, a significant number of Poles served in the Zagatala and Gusar regions of Azerbaijan. Many Polish soldiers were stationed in garrisons in Georgia and the North Caucasus. In the early 1830s, a large group of Poles served in Vladikavkaz - officers of the Chernigov Infantry Regiment and the Lithuanian Battalion, who were exiled to the Caucasus. Many Poles served in the 76th Kuban Infantry Regiment, which formed the basis of the first garrison of Maykop. Their descendants built a church in Maykop at the beginning of the 20th century (10, p. 66). Some researchers believe that in total in 1840 there were 25-30 thousand Poles serving in the Caucasian Corps. From the second half of the 19th century to the beginning of the 20th century, the number of Poles in the Caucasus increased. Migration processes intensified in connection with the development of economic activity in the region. Along with representatives of other peoples, Poles began to come to the Caucasus - specialists in various fields, mainly engineers, doctors, lawyers, architects and office workers. This migration of Poland, unlike the previous wave, was voluntary in nature and was mainly associated with favorable prospects for settlement in the region.

The growth of the urban population in different parts of the country was uneven: in the Baltic provinces it was 192.6% between 1863 and 1897. In the capitals it was 141.5%, in the northern Arkhangelsk, Vologda, Olonets provinces it was only 30.6%, in the Novorossiysk, Lower Volga and Eastern provinces the population increased by 132.7% in cities, and by 87.2% in rural areas (13, p. 45).

Literature

In Azerbaijani

1. *Azərbaycan tarixi. Yeddi cildə. IV cild (XIX əsr)*. Bakı. —Elml. 2007. 504 səh.
2. *Dərbənd şəhərinin kameral təsviri 1831-ci il, "Elm və təhsil"* Bakı – 2020, 328 s.
3. *Əşrəfqızı Arzu. Car-Baləken camaatlığı (XVII əsrin sonu – XIX əsrin 30-cu illəri)*. Bakı, 2009, 256 s.
4. *İrəvan xanlığı. Rusiya işğalı və ermənilərin Şimali Azərbaycan torpaqlarına köçürülməsi*. Bakı, 2010, 618 s.
5. *Sadiqov H. Rusiya-Türkiyə münasibələrində Cənubi Qafqas problemi (1787-1829 –cu illər)*. Bakı, Elm, 1991.

In Turkish

6. *ÇEÇEN, A., Türk Devletleri, İstanbul: Togan Yayıncılık, 2014.*
7. *GÖKÇE, C., Kafkasya ve Osmanlı İmparatorluğunun Kafkasya siyaseti, İstanbul: Şamil Eğitim ve Kültür Vakfı, 1979.*
8. *HASAN, O., Kafkaslarda Rus Yayılması Karşısında Osmanlı-Kaçar Faktörünün Harekete Geçirilme Teşebbüsü (Ağustos-Eylül 1811). Vakanüvis, 2 (2017): 379-392.*

In Russian

9. *Анатолия и Южный Кавказ в 1724-1920-е гг.: в поисках исторической истины, "Инсан" МОСКВА 2014, 258 с.*
10. *История переписей населения в России, Челябинск, 2009 – 66 с.*
11. *История войн России / авт.-сост. А. А. Спек-тор, Т. Л. Шереметьева. Минск, 2007. С. 118.*

12. Вердиева Х.Ю. Переселенческая политика Российской империи в Северном Азербайджане. Баку: Элм, 1999. 298 с.
13. Хаджар Вердиева, Рауф Гусейн-заде «Родословная» армян и их миграция на Кавказ с Балкан. Эссэ. Издательство «Elm», Баку, 2003, стр. 168.
14. Мустафаев Дж. М. Северные ханства Азербайджана и Россия (конец XVIII —начало XIX вв.). — Баку: Элм, 1989. — 128 с
15. Дегоев, В. В. Большая игра на Южном Кавказе : история и современность. М., 2001. С. 448.

Internet resources

16. <https://1905.az/gurcistan-%C9%99razisin%C9%99-erm%C9%99nil%C9%99rin-kutl%C9%99vi-s%C9%99kild%C9%99-kocurulm%C9%99si/>
17. <https://iberiana.wordpress.com/armenia-georgia/maisuradze-saq-som-2/>

Journalism

MEDIA DESIGN AND BOOKS: CONNECTION AND DEVELOPMENT PERSPECTIVES

Dastan Kuandyk

KazNU (Kazakh National University), Faculty of Journalism

Abstract

This article explores the connection between media design and books. It discusses how media design is applied in book design, enhancing aspects such as typography, graphics and illustrations, text layout, and modern formats. The article examines the influence of media design on the visual consumption of books, including digital books and mobile formats, as well as the development of interactive books. Additionally, it highlights the future directions for media design in the book industry, including the use of virtual and augmented reality, interactive learning tools, and digital printing technologies. The article emphasizes the growing relationship between book design and media design and their combined potential for future development.

Keywords: media design, book design, typography, graphics, illustrations, digital books, e-books, interactive books, mobile formats, virtual reality, augmented reality, digital printing technologies, visual consumption of books.

Media design is an art field focused on presenting information visually, considering both its aesthetic and functional aspects. This term has gained significant popularity in recent years and is applied across a wide range of fields, from traditional print design to digital media, the internet, and mobile applications. Books, in turn, remain a crucial format for delivering information. This article discusses the connection between media design and books and its role in this field.

The Connection Between Media Design and Books

The connection between media design and book design is very close. Media design is primarily used to enhance the aesthetic appearance and internal structure of books. Both fields focus on structuring visual information and presenting it in a way that is convenient for the reader or user. The connection between media design and books manifests in the following key aspects:

Typography and Fonts: *The font, size, line spacing, and number of lines in a book are all the result of typographic design. Media designers work with typography to ensure the harmonious integration of text and visuals, making it easy to read.*

Graphics and Illustrations: *Illustrations, images, and graphic elements in a book are part of media design. These elements reveal the content of the book and help capture the reader's attention.*

Layout and Text Arrangement: *The structure of the book and the arrangement of pages are also influenced by media design. Designers focus on the layout of text, the division of chapters and paragraphs, and the integration of diagrams and tables to improve the reading experience.*

Modern Book Formats: *The rise of e-books and audiobooks has opened up new possibilities for media design. The process of producing books in digital formats differs significantly from traditional print design, but the role of media design remains essential. In e-books, the arrangement of text on the screen and the creation of a user-friendly interface are key tasks of media design.*

The Influence of Media Design on the Visual Consumption of Books

In recent years, the boundaries between book design and media design have become increasingly blurred. While books used to be created with traditional printing methods and focused primarily on typography and illustrations, media design now plays a significant role in the visual consumption experience of print books as well as digital and e-books.

Digital Book Versions: *Media design is widely used in the creation of digital books and applications. The interface of e-books, their readability, text size, and color – all of these aspects are the result of media designers' work. For example, to make reading easier on screens, text colors and fonts must be carefully coordinated.*

Mobile Formats of Books: *The reading experience is changing with mobile apps and reading platforms. Media designers develop new solutions and elements to make the interface of books more accessible and convenient for readers.*

Interactive Books: In the digital world, media design is not limited to the text of books. Today, interactive and multimedia books are becoming more widespread. These books may include videos, animations, games, and other elements. Such books offer readers the opportunity to engage with not only the text but also various media tools.

Future Development Directions of Media Design in Books

The connection between books and media design will continue to deepen in the future. With the advancement of digital technologies, book design will acquire new possibilities. These include:

Virtual and Augmented Reality (VR/AR) Technologies: New media design technologies provide opportunities to present books from a fresh perspective. The integration of virtual or augmented reality elements into books can offer readers a deeper and more immersive experience.

Interactive Learning Tools: Media design allows for the creation of e-books as effective tools for education and learning. Interactive elements and multimedia resources could be added to make the learning process more engaging for students.

Digital Printing and 3D Design: The new 3D formats of books, the physical structure of book pages, and the visual experience of reading will reach a new level when combined with the digital age. Digital printing technologies will transform book design and offer new ways to update it.

Conclusion: *The connection between media design and books has been a creative and technological process that has developed over centuries. Modern media design not only influences the artistic side of books but also significantly improves their connection with readers. Contemporary e-books and interactive books open up new opportunities for the future of media design. The visual and functional features of books offer opportunities to elevate creativity in this field to new heights.*

References

1. Dickson, P. (2016). *Media Design: Theory and Practice*. Almaty: Book House.
2. Jumabayev, T. (2019). *History of Book Design and Graphic Arts*. Almaty: Rawan.
3. Mukhamendjanov, E. (2020). *Digital Books and Media Design: New Opportunities and Development Trends*. *New Media and Design Journal*, No. 2, 34-42 p.
4. Adilbekova, G. (2021). *The Intersection of Media Design and Print Design*. Almaty: Science.
5. Altybaeva, R. (2022). *Changes in Book Design in the Digital Age*. *Contemporary Design*, 12(3), 58-63 p.
6. Sharipova, G. (2018). *Graphic Design and Book Arts: Theory and Practice*. Almaty: Kazakh University.
7. Bekenova, N. (2020). *The Role and Future of Media Design in Book Publishing*. *Culture and Arts Journal*, No. 1, 11-17 p.
8. Ermekova, S. (2019). *E-books and Media Design: New Trends in Education*. *Contemporary Education*, 7(2), 45-50 p.

THE ROLE OF VISUAL REPRESENTATION IN MODERN MEDIA

Nurtileu Malikuly

Al-Farabi Kazakh National University, Faculty of journalism

Abstract

In today's fast-paced world, visual communication has become a critical element in delivering information effectively. Modern media increasingly relies on visual tools such as infographics, charts, and videos to make complex information accessible and engaging. This article explores the significance of visual representation in media, focusing on its role in improving information comprehension, its application in global and Kazakhstani media, and the ethical considerations associated with visual storytelling.

Introduction

The rapid development of digital technologies has transformed the way information is consumed. Media platforms are no longer limited to textual narratives; instead, they integrate visuals to capture the audience's attention and convey messages more efficiently. This shift is particularly important in a time when audiences have shorter attention spans and demand quick, clear, and appealing content. Visual representation, therefore, has become a cornerstone of effective communication in journalism, marketing, and education.

The Importance of Visual Representation

Visual elements play a vital role in enhancing the clarity and appeal of information. Research in cognitive psychology suggests that humans process images 60,000 times faster than text. Infographics, for example, can summarize extensive data sets in a way that is easy to understand and retain. Additionally, visuals stimulate emotional engagement, making messages more memorable.

Applications in Global Media

Globally, media organizations have embraced visual tools to improve storytelling. News outlets such as The New York Times and BBC frequently use data visualizations to accompany their reports. Social media platforms like Instagram and TikTok also prioritize visual content, underscoring the growing demand for visually engaging media.

The Case of Kazakhstani Media

In Kazakhstan, media organizations have gradually integrated visual elements into their content. Platforms such as Tengrinews.kz and Informburo.kz frequently use infographics and multimedia tools to present news stories. However, the use of visual content in Kazakhstani media still faces challenges such as limited resources, lack of expertise, and a focus on traditional formats like textual articles and TV broadcasts.

Ethical Considerations

While visual representation offers numerous benefits, it also poses ethical challenges. Misleading visuals, oversimplification of complex issues, or the misuse of graphic tools can distort reality. Media organizations must ensure that their visuals are accurate, contextually appropriate, and ethically sound.

Conclusion

Visual representation has become indispensable in modern media, enhancing the way information is communicated and understood. As global and Kazakhstani media continue to adopt visual tools, it is crucial to address both the opportunities and challenges they bring. By prioritizing accuracy, creativity, and ethical standards, media organizations can use visuals to foster informed and engaged audiences.

Jurisprudence

THE PLACE AND ROLE OF THE HURUFISM MOVEMENT IN GLOBAL IDEAS

Atilla Ozturk

Azerbaijan, Nakhchivan Autonomous Republic Nakhchivan State Universit
ORCID: 0000-0002-9686-713X

Gahraman Behbudov

Azerbaijan, Nakhchivan Autonomous Republic Nakhchivan State Universit
ORCID: 0000-0002-2319-9222

Tofiq Huseynov

Azerbaijan, Nakhchivan Autonomous Republic Nakhchivan State Universit
ORCID: 0000-0002-0866-9599

Nurlan Ismayilov

Azerbaijan, Nakhchivan Autonomous Republic Nakhchivan State Universit
ORCID: 0000-0001-8029-9935

Abstract

As a result of the Renaissance that emerged from the social, economic, and commercial-cultural development in Azerbaijan during the 14th century, revolutionary movements began to gain the solidarity of the general population, led by the prominent thinkers and philosophers of the time. Additionally, in order to protect themselves from the severe pressures created by military-feudal and other organized power holders, as well as from the harsh and dangerous threats posed by scholars, Sufi sheikhs, and government rulers, it became essential for them to defend their revolutionary beliefs and convictions under the guise of the existing sect, faction, or Sufism.

Hurufism, as a significant philosophical and high-level ideological belief system, emerged as a political-legal ideology. Before long, it expanded beyond its birthplace in Azerbaijan, spreading into the ideological currents of the Near and Middle East, and Western Europe, influencing social, economic, political life, and the formation of legal worldviews.

The article focuses on the role and place of global ideas related to the defense of the inherent, undeniable rights and freedoms of humanity, regarded as the noblest of creatures, as the foundation of the ideological and belief philosophy that emerged during the Hurufi period.

Keywords: Hurufism, ascetic, oppressor, Haqq (Truth), sheikh, prayer, ideology, scholar, mystic, human, poet, cultural development, secularism.

In Eastern literature, ascetic mystics who remain oblivious to the essence of meaning and become captives of superficial concepts are subject to the criticism and disdain of almost all scholars and people. Numerous Sufi-oriented poets have targeted these ascetic mystics with sharp criticism in their poetry. Hurufism, though rarely engaging with Sufi themes, also includes many such examples, especially among Hurufi poets. For instance, the Hurufi poet Arshi critiques these ascetic mystics in his collection, stating: "Do not think that just because I wear wool (a symbol of Sufism), I am a Sufi. I am a man of virtue and a follower of Hurufism." (1, p. 136)

Ascetics and devotees are those trapped within dualities, unable to reach unity. They are incapable of perceiving Haqq (Truth) within themselves or in all created beings. Even if they perform prayers and fast day and night, or abandon worldly pleasures, they cannot attain unity. In contrast, those who observe Haqq within their being and in all creation partake in life's offerings with a clear vision, acknowledging that all sustenance is created for humanity's progress and development.

Hurufism is not a Sufi order but a philosophical and ideological movement. Based on the knowledge of letters and symbols in existence, its adherents work resolutely in the practical domain to achieve true unity.

Sufi sheikhs and followers of mysticism emphasized renunciation, poverty, and abstinence from worldly pleasures as unchangeable principles of their ideology. Consequently, they rejected any resistance or popular uprisings against feudal regimes or foreign oppressors, basing this stance on their ideological and doctrinal principles. For this reason, Mongol leaders, military-feudal commanders, and others would integrate into the circles of Sufi mentors, using these spiritual platforms to protect their

political and economic positions. Without significant barriers, the masses increasingly turned to Sufi leaders and convents (khanqahs). These khanqahs often became havens for rebels, laborers, and mystics seeking solitude.

The Renaissance arising from Azerbaijan's 14th-century socio-economic and cultural-commercial progress brought leading thinkers and philosophers of the time to unify the masses in revolutionary movements. They sought to shield themselves from the severe oppression of military-feudal systems, leveraging existing sectarian, doctrinal, or mystical frameworks for protection.

In the aftermath of the Mongol invasions, collective movements often manifested under Shi'a banners, with the majority adhering to Sufi-based ideologies. The 15th-century poet and mystic Abd al-Rahman Jami wrote:

"Among the false Sufis were heretics who followed esoteric beliefs akin to true Sufis. They lived humbly, practicing asceticism, but their true thoughts and lifestyles had nothing to do with Sufism; they were even opposed to it." (8, p. 12)

Although post-Mongol movements appeared outwardly rooted in Sufi-inspired ideologies, their primary objective was often to mislead and manipulate the people under the guise of religious or mystical principles.

The Hurufism movement effectively fulfilled its religious, political, and historical role in the late 14th century. Hurufism proclaimed: "O human, you are the Truth; your existence is one of the undeniable manifestations of the Truth. You have inherent, unchangeable rights and privileges. You are the embodiment of the Truth, and your natural, social, political, and other rights must be recognized and protected by yourself and others. O human, you are the noblest of creation and the vicegerent of the Earth. Your coming into existence is so sublime and sacred that no one has the power or authority to infringe upon your inherent rights and privileges. For you, yourself, are the manifestation of the divine Creator."

What, then, is the secret behind the indifference and lack of respect from the Sufi sheikhs in their retreats towards you? The difference between enlightened scholars and ascetic Sufis becomes evident here. The unique status and position of enlightened scholars are evident in their social, legal, and historical significance, as seen in towering figures like Shabistari, Fazlullah Naimi, and especially Nasimi. History bears witness to this—but not in the case of ascetic Sufis.

As observed, renouncing the world and worldly blessings holds no value in the principles of Hurufism. A life oriented towards human rights and truth is not found in ascetic living but rather in worldly existence. This is what grants humans true happiness. It is the Hurufis and ascetics who exploit the pure spirits and loyal hearts of people. They slander and condemn.

Like all other intellectual movements, the Hurufis benefited from the ideas of preceding philosophers, scholars, and other thinkers. This is inevitable from the perspective of historical science. However, most researchers initially explained Hurufism by asserting its ideological and theological connections with the Kabbalistic school. Their sole evidence for this connection was Fazlullah Naimi's profound knowledge of the Quran, the Bible, and the Torah, as well as his references to them, claiming that Hurufism arose under the influence of Christianity, Jewish Kabbalism, and prior Sufi traditions.

Another hypothesis suggests that the city of Tabriz, during Fazlullah Naimi's time, was one of the most significant trade hubs among nations. The constant visits of Spanish, Venetian, and Genoese merchants and other businesspeople led to socio-economic interactions, making it plausible that the Kabbalistic and Hurufist ideas circulating in Spain at the time influenced the development of Hurufism in the region. Moreover, it is highly likely that these Hurufi ideas also impacted Western European countries.

Dr. R. Tofiq writes: "The core of Hurufism was formed from the Druze sect. They absorbed elements from Plato's philosophy, Jewish Kabbalism, Shi'ism within Islam, Christian Trinitarianism, Sufism, and the philosophy of the Unity of Being. They consider Fazlullah Naimi no one other than the sage of the Druze sect, Zuhumasa. (8, p.47) This sect's theological foundation posits that the Creator is fully manifested in creation, and the perfection of humanity is its mirror. They existed 400 years before Hurufism and still hold this perspective. (6, p.938)"

There are not many researchers who deny the independence of Hurufism's ideas. Many connect Fazlullah's scholarship to the teachings of Hurufism, Mansur Hallaj's poetry, and the books of Al-Tusi. There are also those who attribute the core philosophical ideas of Nasimi—such as the concept of the macrocosm and microcosm, and the idea of humanity being the epitome of Truth—to the Hurufi Brotherhood. Some have gone so far as to label these researchers heretics, infidels, or atheists.

However, Hurufism is an independent, unique, and confident ideology. This does not mean that the Hurufis did not benefit from any philosophical or legal movements. Throughout human history, every

intellectual movement has relied on its predecessors and evolved. In its two and a half centuries of powerful existence, the Hurufism movement exerted strong, reciprocal influence on all philosophical-legal trends and sectarian rites. This is solid, irrefutable evidence of its uniqueness and independence. A philosophical movement cannot be condemned merely because of a few superficial similarities.

Neither Fazlullah Naimi nor other Hurufi scholars or writers have written anything against the Quran. A significant point is that the deep, multifaceted meanings of Hurufi ideas are consistent with the Quranic verses and hadiths. All Sufi scholars agree that knowing the divine Creator inevitably passes through knowing humanity. This scientific explanation elevates the status of humanity to that of God. (6, p.48)

According to Batiniyya and Hurufi interpretations, the Prophet himself referred to the inner and outer meanings of the Quran. The Quran also clearly commands the interpretation and explanation of its verses. However, their full interpretation is known only to God (or to God and those deeply rooted in knowledge). Those who are deeply rooted in knowledge declare, "We believe in them; all of them are from our Lord." But only those with understanding grasp this. (3, p.453)

Some scholars have attempted to depict the Hurufi movement as an esoteric philosophical-legal school, emphasizing the necessity of understanding the inner meanings of Quranic verses. However, Fazlullah Naimi regarded Sharia as a mirror of truth, thus advocating for the comprehension of the inner meanings of Quranic verses (1, p.125).

On the other hand, the Hurufis believed that even after attaining true faith, they were obligated to perform religious rituals. This sets them apart from other esoteric movements. A prominent Hurufi scholar considered adherents of Sharia to be people of outward practice, stating, "Those who do not pray are incapable of comprehending the Prophet's secret." (7, p.128). Consequently, accusations labeling the Hurufis as heretics, apostates, or irreligious individuals are unfounded.

Abu Mansur writes: "Hurufis behave like Sunnis in Sunni assemblies and like Shias in Shia gatherings." Similarly, A. Gulpenarlı states that Hurufis outwardly identify as Sunnis among Sunnis and as Shias among Shias, utilizing characteristics of esoteric Shiism. While they acknowledge eleven Imams and deny the existence of the twelfth Imam (Imam Mahdi), aligning somewhat with Sunni views, their ablution practices match those of Sunnis rather than Shias, who perform ablution by wiping their feet (1, p.132). Moreover, during prayers, Hurufis insist on folding their arms (like Sunnis), contrasting with Shia practices of keeping arms free (1, p.133).

Thus, the limited alignment with Shiite doctrines precludes labeling the Hurufis as purely Shia. Their distinctive ideas, spiritual philosophy, and unique principles highlight their position beyond Sunni or Shia classifications, signifying an independent intellectual and mystical movement.

Hurufism exerted a profound influence on other sects and political orders through its leaders, poets, philosophers, and intellectuals. Esteemed figures like Balim Sultan, known as Pir-i Sani among the Bektashis, and others such as Osman Baba, Yamini, and Baghdadli Ruhi, played key roles in propagating Hurufi thought. This ideology also permeated the works of prominent poets in the Mevlevi tradition, such as Muhammad Dede and Hussain Fakhruddin Dede.

One of the central themes of Hurufism, the "Istiva Line" (the Middle Path), is evident in the symbols used by Mevlevi leaders, such as the vertical line on their hats and cloaks, possibly inspired by the Hurufi concept of the Istiva Line (2, p.375).

Prominent scholar T. Khumarlu, in his work "Imadeddin Nasimi and the Hurufi Movement," asserts that in Anatolia and the Balkans, groups within the Bayrami, Malamati, Qalandari, and Khalwati orders, as well as some Qizilbash factions, were significantly influenced by Hurufism (4, p.59). Similarly, Ahmed Yashar suggests that Qalandari Sufi orders were deeply impacted by Hurufi pantheistic philosophy, evident in the teachings of figures like Qayghiz Abdala and Ottaman Baba (5, p.148).

During the 15th century, Hurufism gained traction in the Ottoman Empire and even influenced the palace. However, its adherents faced severe persecution, as illustrated by the execution of Hurufi scholars under Sultan Mehmed II. Despite such challenges, Hurufism persisted, becoming a core doctrine within the Bektashi order during the 16th and 17th centuries.

The Bektashis revered figures like Imam Ali, Haji Bektash, and Fazlullah Naimi, and their doctrines, such as Nuqtat-ul-Bayan, were rich with Hurufi teachings. Similar to Hurufis, they wore white cloaks and hats (9, p.202).

Another movement, the Nuqtavis, emerged as a derivative of Hurufism, founded by Muhammad Pesikhani, a disciple of Fazlullah Naimi. This demonstrates the enduring influence of Hurufism.

Renowned scholar Tawakkuli, in his book "The Hurufi Movement," highlights the ideological goal of Hurufism: to liberate humanity from superstition, foster creativity, and achieve enlightenment. Based

on a pantheistic philosophy, Hurufism sought to abolish inequality, dismantle ideological weapons of oppression, and elevate human beings as the ultimate manifestation of divine truth (4, p.122).

Because humanity forms the core of Hurufi thought, according to this ideology, everything and the essence of existence finds meaning and significance in the existence of humanity.

Based on pantheist philosophy, the main goal and social-political and legal objective of Hurufi teachings is to achieve the abolition of fanaticism and inequality in terms of rights, to break the weapon of oppression used by cruel individuals who exploit religion under the guise of ignorance (ideological weapon), to ensure real enlightenment of people, to promote the development of science, and ultimately to free the human being—who is considered the unique secret of existence—from separation and guide them towards the eternal right path.

References

1. Şəhid Hüseyni Qəşqai, "Hürufilik nehzəti", Əncami kitab Nəşriyyatı, 1979 .48 səh.
2. Z. M. Bünyadov və V. M. Məmmədəliyev, "Quran-i Kərim", Bakı, Şərq-Qərb Nəşriyyat evi, 2011, 304 səh.
3. Y. Babayev, "Təriqət ədəbiyyatı sufizm, Hürufizm" Nurlan Nəşriyyatı, Bakı. 2007, 132 səh.
4. İ.Nəsimi, "Seçilmiş əsərləri", ikin-ci bölüm (ictimai-fəlsəfi), Lider Nəşriyyatı, Bakı, 2004, 167 səh.
5. M. Hüseyn Şəhryar, "Divani Şəhryar", "Nigah" nəşriyyatı, Tehran, 2011, 321 səh.
6. Ə.Qasım, "İrfan və Təsəvvüfün Məbanisi", Təhəvvür Nəşriyyatı, 2000, 198 səh.
7. Tağı Xümarlū, "İmadəddin Nəsimi və Nehzəti hürufilik", Təbriz-Tələş Nəşriyyatı, 1958 , 42 səh.
8. Y. C. Pəndəri, "İmaddəddin Nəsiminin əsəri və yaşayışı", Ney Nəşriyyatı, 1993, 436 səh.
9. Əli Mir Fötrüs, "Hürufilik hərəkatı və Pesixanilər Nehzəti", Bəmdad Nəşriyyatı, 2001. 104 səh.

CRIMINALISTIC CHARACTERISTIC OF DRUG CRIMES

Namig Gubad Ibrahimli

dissertator of the Center of Forensic Examination of the
Ministry of Justice of the Republic of Azerbaijan
<https://orcid.org/0009-0005-7110-5445>

Abstract

The article is devoted to the definition of the concept, content and elements of the criminalistic characteristics of drug crimes. The information reflected in the criminalistic characteristics of criminal activity can be used in parallel with the detection and investigation of crimes and in solving criminal-legal and criminological tasks. The concept of criminalistic characteristics should reflect not a system of descriptions of the elements of criminal activity, but a information system should reflect the pattern of these elements on the relevant data carriers. The criminalistic characteristic should include such elements that allow the investigator to determine the program of action at a particular stage of the criminal case, to choose the appropriate line of behavior (action) for the investigator, the most effective methods of conducting investigative actions, to correctly assess the existing investigative conditions, and to assess the progress of the investigation from a prognostic perspective. It is not correct to include an element such as "victim's personality" in the structure of the criminalistic characterization. Thus, unlike many other crimes, there is no specific victim in crimes related to the illegal trafficking of drugs. In general, these types of crimes cause harm to society, the state, and the lives and health of the population. Author proposes the elements system of the criminalistic characteristics of drug crimes.

Keywords: criminalistic characteristic, drug crimes, investigative methodology, criminal groups, circumstances of the crime, elements of criminal activity

"National drug control strategies should not only decriminalise possession for personal use (and provide integral assistance plans for problematic drug users) and recognise different types of trafficking, but also seek to alleviate the socio-economic circumstances of those who commit trafficking offences. Besides being disproportionate and ineffective, the increasing severity of sentencing for drug offences over these past few decades is a major contributing factor to the overcrowding of prisons and the overburdening of criminal justice systems around the world. A range of mitigating factors, including the offender's motivation and socio-economic circumstances, should be given much more consideration during sentencing" [2, s.10].

Resolving the above issues requires a more in-depth study of the criminalistic characteristic of drug crimes.

One of the main stages in developing the scientific and theoretical foundations of the investigation of drug crimes and a special criminalistic methodology is the determination of the essence and structure of the criminalistic characteristics of this type of crime, as well as its main elements. "...drug crimes in the network era are characterized by concealment, intelligence and cross-border.." [4, s.134].

The first element of investigative methodology is the criminalistic characterization of crimes. A more pragmatic approach to the criminalistic characterization of crimes has begun to take shape in criminalistic, and a convergence is being observed in existing positions regarding its concept, essence, content, and purpose.

The information reflected in the criminalistic characteristics of criminal activity can be used in parallel with the detection and investigation of crimes and in solving criminal-legal and criminological tasks. However, in any case, the criminalistic characteristic should primarily have criminalistic significance. This property of information is determined by its ability to help solve crimes.

The concept of criminalistic characteristics should reflect not a system of descriptions of the elements of criminal activity, but a information system should reflect the pattern of these elements on the relevant data carriers.

We believe that the criminalistic characteristics of drug crimes mean a systematic set of the most characteristic information about the interconnected signs and characteristics of certain types of crimes, that is, an information system (model), which can serve as the basis for making assumptions about the

circumstances of the crime and the personality of the criminal, and, by allowing for the correct assessment of the circumstances arising in the process of solving and investigating drug crimes, it conditions the application of appropriate forensic methods, techniques and tools.

The criminalistic characteristic should include such elements that allow the investigator to determine the program of action at a particular stage of the criminal case, to choose the appropriate line of behavior (action) for the investigator, the most effective methods of conducting investigative actions, to correctly assess the existing investigative conditions, and to assess the progress of the investigation from a prognostic perspective.

The structure of the criminalistic characteristic should include the circumstances of the crime (primarily the place and time); the method of committing and concealing the crime; typical traces of the crime and their probable location; the object (subject) of the criminal intent; the personality of the criminal. This system should also include the typical methods of committing the crime; typical features of the personality of the criminal; the characteristics of the criminal group when the crime is committed in a group; characteristics of the injury; other circumstances (for example, information about the victim; circumstances affecting the nature and degree of responsibility of the accused; the nature and extent of the damage caused; reasons and circumstances contributing to the commission of the crime). In fact, the elements mentioned are elements that are characteristic of any crime.

The elements of the criminalistic characteristics of drug crimes include the level of prevalence of the criminal act; the features of detecting relatively common crimes; the conditions of protection of the object of the crime from criminal intent; the characteristics of typical circumstances of crimes, typical material traces of the crime, material evidence that may be of importance, the most likely places of their discovery, criminal habits and skills, criminal connections; the most widespread goals and motives for committing the crime; information about the circumstances, causes and circumstances that contribute to the commission of crimes; typical investigative conditions; typical material traces of the crime and the places where they are likely to be found; tools and means used during the commission of the crime; other information (on the structure and connections of organized criminal groups), etc.

We believe that there is no need to include the circumstances to be proven as an independent element in the criminalistic characteristics, since the circumstances to be proven are covered by the content of other elements of the specific criminalistic methodology.

The criminalistic characteristics of drug crimes should include the subject of the criminal intent - drugs; the method of committing the crime (including actions to prepare for the commission of the crime and conceal it); the characteristics of the material traces of the crime and the places where they are likely to be found; the characteristics of the personality of the criminal - those who prepare, store and sell drugs, the purpose and motives of his actions; the circumstances of the commission of the crime (place, time and other circumstances).

The characteristics of drug crimes should include the characteristics of the initial typical information; a system of information about the typical methods of committing and concealing these crimes and the typical consequences of their application; the identity of the criminal and the goals and motives of his/her commission of the crime; information about the identity of the alleged victim of the crime and the typical object of criminal intent; information about some typical circumstances of the commission of crimes; information about typical circumstances that contribute to the commission of specific types and types of crimes.

The moral and psychological characteristics of a drug offender do not differ in the best way from those characteristics that are distinguished by criminologists. In the motivational sphere of these persons, the needs of a biological and material nature prevail, largely connected with the need for drugs, primitive pleasures, parasitism, the desire to realize one's personality through leisure activities, material consumption. The moral and psychological characteristics of the criminal's personality are structured segments of qualities directly or indirectly related to the antisocial behavior of a person, causing or facilitating the commission of a crime, or making it possible to understand its causes. In most cases, they have stable deviations in moral orientation, expressed in the absence of positive attitudes. Moral deformation of their personality negatively affects emotional features. The following character traits are characteristic of such persons: rudeness, aggressiveness, short-temperedness, imbalance, intemperance, weak adaptability, adaptation to difficult life conditions, inability to overcome them, increased anxiety. The study of the personality of this type of criminals should be conducted in different areas of social and legal psychology, criminology, rather than within the framework of usual general approaches to the identity of the criminal.

It is not correct to include an element such as "victim's personality" in the structure of the criminalistic characterization. Thus, unlike many other crimes, there is no specific victim in crimes related to the illegal trafficking of drugs. In general, these types of crimes cause harm to society, the state, and the lives and health of the population. "A review of subcultural, role, and ecological theory suggests that drug use and crime may emerge from the same etiological variables and become an integral part of a street-drug-using lifestyle and subculture. Radical theory argues that the drugs/crime relationship is created by social policy that makes drugs illegal" [3, s.257].

When investigating illegal activities with drugs, in most cases, they pay attention to traditional traces. The criminal can also leave traces that are characteristic of drug crimes. These are the traces that are formed during the manufacture and processing of a specific type of drug; traces of transportation and storage of drugs; traces of the purchase of drugs.

Traces of specific drug production and processing include: land-grown drugs plants (cannabis, poppy); plant residues in places of cultivation and collection (stems, leaves, inflorescences, pollen); processing materials and waste (used and processed plant parts, solvents); by-products of the manufacture and purification stage of narcotics (e.g., dark brown wall cladding from acetylated opium); ready-to-use drugs, synthesis components of the drug process (anhydride, acetone, vinegar); formulation, special literature, rough notes describing the methods of drug production (notebooks, notebooks, sheets); blankets, cloths, plastic film over which could be seeped hemp; finger marks: on the tools used to commit the crime (dishes, weights), on the means of consumption of drugs (syringes), on the devices for their storage (containers, bags), various micro-objects on them.

The traces of transportation and storage of drugs include: specially equipped containers and caches in vehicles, in the clothing of carriers, as well as special «containers» placed in the body of the carrier (in natural holes, in the stomach, etc.); drug traces on suspects' hands, seams, pockets of their clothes and other micro-objects; Smell traces related to drugs; money and other valuables (audio and video equipment, precious metal products, fur), which were obtained for the manufacture and possession of drugs, addresses and telephones of carriers, etc.; correspondence, telegrams, notebooks and other documents showing links between criminals.

Traces of drug acquisition include: paper and other packaging (scraps and pieces of paper, polyethylene, foil); traces of the drug itself on the suspects' hands, seams, folds and pockets of their clothes and other micro-objects; Traces of smell associated with drugs; addresses and phone numbers of carriers, dealers etc.

The content of the criminalistic characteristics of drug crimes committed directly by organized gangs includes information about the criminal incident (place, time, method of committing the crime and other circumstances); circumstances characterizing the personality of the criminal, the form of participation (organized gang); the form and motives of the guilt; circumstances that contributed to the commission of the crime. These elements allow for the development of typical investigative hypotheses for the investigation of crimes. "Dealing effectively with a diverse criminal population requires replacing stereotypical images of junkies with a realistic view of the characteristics of drug-involved offenders. police, prosecutors, and other criminal justice practitioners must know who the offenders are, what crimes they commit, where they commit crimes, and what can be done to prevent them from victimizing others" [2, s.2].

The development and expansion of the Internet expands the ways of committing drug crimes and helps organization in a transnational context. Ways of committing drug crimes committed using Internet resources are becoming more sophisticated. More advanced non-contact methods are appearing, starting from advertising for the search of clients to payment by the buyer through electronic payment systems, sending goods by mail or delivery by courier. Such contactlessness requires the development of appropriate methods of identifying criminals. The development of Internet technologies opens up new opportunities for criminals; all illegal transactions are carried out through closed channels.

Organized drug crime is characterized by the following: 1) increasing or decreasing number of drug crimes committed by organized criminal groups; 2) organized crime has increased in a large number of actors their perpetrators, in organized criminal activities, as a system of interrelated criminal acts; 3) the level of activation of various criminal formations: organized groups, gangs, criminal organizations (criminal communities), illegal armed formations, Extremist communities, extremist organizations etc.

Taking into account the specifics of the criminal activities of criminal groups (criminal organizations) related to drug crimes, the structure of the criminalistic characteristics of these types of crimes includes the identity of the criminal, his relationship with other participants in the criminal group; the object of the criminal intent or the material expression of property services; the circumstances of the

crime (place, time, circumstances); methods of preparation, commission and concealment of criminal activity; the mechanism of harm and the criminal group (criminal organization).

Criminal groups dealing with drug crimes are highly professional, their members have specific personal qualities, knowledge, skills and abilities; they are reliable and effective. Specific personal qualities, knowledge, skills and abilities are related to personal qualities. Criminal activity is complex and requires a system of mental and physical resources that allows goals and objectives to be set, plans to be drawn up and subsequently implemented. Criminal skill as a capacity based on acquired knowledge and skills to carry out criminal activity requires a special system of knowledge and skills; achievement and flexibility.

The reliability of the criminal group as one of the indicators of criminal professionalism is connected with mental and physical resources and features. Unlike others, charisma is noted among the characteristics of reliable professional criminals. Reliability is connected with increased latency of committed crimes.

The structure of the forensic characteristics of crimes committed by criminal gangs includes the criminal incident; circumstances characterizing the personality of the criminal, the form of participation (organized group); goals and motives; circumstances that contributed to the commission of the crime, and the circumstances of the investigation.

We believe that the investigative situation is not a criminalistic characteristic, but one of the structural elements that constitute the specific methodology of investigating this type of crime.

The criminalistic characteristics of organized criminal activity are a system of information that characterizes key elements such as the method, mechanism and circumstances of committing crimes, the nature of the injury, the identity of the accused, and the motivation of criminal behavior in the circumstances of the preparation, commission and concealment of crimes, and is taken into account in the investigation methodology.

We propose to include the following elements in the criminalistic characteristics as signs characteristic of drug crimes:

- information of criminalistic importance about the typical object of criminal intent (its definition, classification, characteristics, conditions and features of its preservation, features of its preparation technology and circulation, as well as information about persons involved in these processes);*
- generalized information about the criminal's identity (gender, age, education, skills and habits, convictions, employment, social status, etc.);*
- when drug crimes are committed by organized groups, information about the typical composition of the organized group, the existing pattern of interaction within the group, the personality of the leader (organizer), motives for action and behavior, goals, criminal skills and habits, and mutual relations between group members;*
- typical motivation and purpose of criminal behavior during the commission of crimes;*
- a system of information on typical methods of preparation and commission of crimes (including their, i.e., typical results of the application of these methods);*
- information on tools, means, auxiliary devices and equipment, materials, etc. used in the course of criminal activity;*
- methods of concealing traces and instruments of crime;*
- information about typical circumstances of the commission of a crime: circumstances, time, place, technological operation performed;*
- information about typical material traces of criminal activity and their most likely places of detection, as well as ideal traces.*

It should be noted that all elements included in the structure of criminalistic characteristics, being interdependent and interconnected with each other, collectively form a whole system.

Based on the generally accepted ideas about the elements of criminalistic characteristics, the analysis of special literature devoted to the problems of combating the illegal circulation of drugs, as well as the study and generalization of existing judicial and investigative experience, it can be concluded that the criminalistic characteristics of drug crimes are a typical information model reflecting the typical, in many cases recurring features of these crimes.

References

1. Gloria, Lai. *Drugs, crime and punishment Proportionality of sentencing for drug offences.* - Amsterdam (The Netherlands): Transnational Institute, Series on Legislative Reform of Drug Policies Nr. 20 June 2012.- 12 s.

2. Marcia, R. Chailen; Bruce, D. Johnson. *Characteristics of Different Types of Drug-Involved Offenders*. – Washington, DC: U.S. Department of Justice National Institute of Justice Office of Communication and Research Utilization, – February 1988. -35 p. URL: <https://www.ojp.gov/ncjrs/virtual-library/abstracts/characteristics-different-types-drug-involved-offenders>

3. McBRIDE, D. C., & McCOY, C. B. (1993). *The Drugs-Crime Relationship: An Analytical Framework*. *The Prison Journal*, 73(3), 257-278. <https://doi.org/10.1177/0032855593073003002>

4. Song, Zhuobin. *Characteristics of Drug Crimes in the Network Age and Its Countermeasures*//– Ottawa (Canada): *Science of Law Journal*, Clausius Scientific Press, –2024. Vol. 3 Num. 2, – c.129-134. URL: <https://www.clausiuspress.com/article/11867.html>

HUMAN AS THE FUNDAMENTAL SUBJECT-OBJECT OF UKRAINIAN CONSTITUTIONALISM: ON THE QUESTION OF DEFINING THE SOCIO-TELEOLOGICAL COORDINATE SYSTEM

Mykhailo Oleksandrovich Baimuratov,

Doctor Habilitat of Law, Professor,
Honored Worker of Science and Technology of Ukraine,
Academician of the Ukrainian Academy of Sciences,
Professor of the Department of Political Sciences and Law
South Ukrainian National Pedagogical
university named after K.D. Ushinskogo, Odesa,
Ukraine

ORCID: 0000-0002-4131-1070

Boris Yakovych Kofman

Doctor Habilitat of Law, Senior Researcher,
Honored Lawyer of Ukraine,
Professor of the Department of Political Sciences and Law
South Ukrainian National Pedagogical
university named after K.D. Ushinskogo, Odesa,
Ukraine

ORCID: 0000-0001-8121-5190

Khvan Ruslan Mykolayovych,

Candidate of Legal Sciences, Doctoral Student
National Aviation University, Kyiv,
Ukraine

ORCID: 0000-0002-5053-6343

ЛЮДИНА ЯК ОСНОВОПОЛОЖНИЙ СУБ'ЄКТ-ОБ'ЄКТ УКРАЇНСЬКОГО КОНСТИТУЦІОНАЛІЗМУ: ДО ПИТАННЯ ВИЗНАЧЕННЯ СИСТЕМИ СОЦІАЛЬНО-ТЕЛЕОЛОГІЧНИХ КООРДИНАТ

Баймуратов Михайло Олександрович

доктор юридичних наук, професор,
Заслужений діяч науки і техніки України,
академік Української академії наук,
професор кафедри політичних наук та права
Південноукраїнський національний педагогічний
університет ім. К.Д. Ушинського, м. Одеса,
Україна

ORCID: 0000-0002-4131-1070

Кофман Борис Якович

доктор юридичних наук, старший дослідник,
Заслужений юрист України,
професор кафедри політичних наук та права
Південноукраїнський національний педагогічний
університет ім. К.Д. Ушинського, м. Одеса
Україна

ORCID: 0000-0001-8121-5190

Хван Руслан Миколайович

кандидат юридичних наук, докторант
Національного авіаційного університету, м. Київ,
Україна

ORCID: 0000-0002-5053-6343

Abstract

The article is devoted to the study of the issue of defining the system of socio-teleological coordinates of a person as the fundamental subject-object of Ukrainian constitutionalism. It is proved that the system-complex analysis of the phenomenology of constitutionalism shows that its fundamental subject and object is man. It is stated that in the conditions of the formation of a democratic legal statehood, the problems of modern constitutionalism are objectified, actualized, reflected and contextualized, which is based on the anthropologization and anthropocentrism (human-centrism) of law in general and constitutional law, in particular – that is, it is about the fact that a person acts as a fundamental sub an object-object of both general and Ukrainian constitutionalism.

Анотація

Стаття присвячено дослідженню питання визначення системи соціально-телеологічних координат людини як основоположного суб'єкта-об'єкта українського конституціоналізму. Доводиться, що системно-комплексний аналіз феноменології конституціоналізму свідчить про те, що його основоположним суб'єктом та об'єктом виступає людина. Констатується, що в умовах становлення демократичної правової державності об'єктивується, актуалізується, рефлексується і контекстуалізується проблематика сучасного конституціоналізму, що базується на антропологізації та антропоцентризмі (людиноцентризмі) права взагалі та конституційного права, – тобто, йдеться про те, що людина виступає основоположним суб'єктом-об'єктом як загального, так й українського конституціоналізму.

Keywords: democratic legal statehood, general constitutionalism, Ukrainian constitutionalism, man, human rights, local self-government, municipalism.

Ключові слова: демократична правова державність, загальний конституціоналізм, український конституціоналізм, людина, права людини, місцеве самоврядування, муніципалізм.

Вступ

Системно-комплексний аналіз феноменології конституціоналізму свідчить про те, що його основоположним суб'єктом та об'єктом виступає людина. Це підтверджується, по-перше, історичними, теоретичними і праксеологічними настановами становлення, формування, реалізації, розвитку та вдосконалення профільної феноменології. По-друге, це знаходить свій прояв в складній динаміці влади та демократії, де демократичні настанови, що уособлює феноменологія прав і свобод людини, знаходить свій прояв і закріплення, особливо в умовах демократичної правової державності. Отже, по-третє, людина, її права і свободи виступає не тільки телеологічною домінантою конституціоналізму, а й його ідеологічною, онтологічною, аксіологічною, нормативною, наративною та конотаційною його настановами, – це твердження аргументується тим, що основоположною метою конституційних регламентації і регулювання є пряме (безпосередня нормативно-правова регламентація і регулювання прав, свобод і обов'язків людини – авт.) або опосередковане (нормативно-правова регламентація і регулювання компетенційних повноважень органів публічної влади, що, своєю чергою, впливають на стан визнання, легалізації, легітимації, реалізації та вдосконалення прав, свобод і обов'язків людини – авт.) формування правосуб'єктності людини в умовах конституційно-правових реалій, а також практичними діями публічної влади щодо «обслуговування» (формування, супроводження, забезпечення, реалізації їх конституційно-правового статусу – авт.) людини, її груп та асоціацій, екзистенційних та чинних інтересів цих суб'єктів, а також життєвих ситуацій в яких вони здійснюють своє існування і функціонування через контекстуалізацію ординарних та екстраординарних атитюдно-габітусних (поведінково-праксеологічних) характеристик. Звідси, по-четверте, концептуально права і свободи людини, тобто сама людина у дзеркалі її соціально-нормативних характеристик і проявів – виступає стратегічною суттю і функціонально-динамічним змістом конституціоналізму та тригером у розвитку демократичної правової державності.

На наш погляд це переконливо підтверджується визначенням гуманітарно-гуманістичної складової в дефінітивних визначеннях конституціоналізму.

Доктринальне визначення і розуміння феноменології конституціоналізму

Варто зазначити, що дефінітивні визначення феноменології конституціоналізму є різними та зазвичай відображають авторську позицію, в якій переважають відповідні авторські наукові пріоритети та парадигмальні акценти.

Так, в контексті історичної ретроспективи зазвичай представниками конституційної доктрини стверджується, що конституціоналізм як політико-правова категорія та доктринальне вчення виникає після утвердження конституції держави в сучасному розумінні цього терміну (історично-установча компонента конституціоналізму – авт.). Отже, він безпосередньо пов'язаний із конституцією держави, хоча не завжди факт наявності конституції автоматично означає появу певної моделі конституціоналізму як такого (формально-альтернативна компонента конституціоналізму – авт.). Водночас для існування конституціоналізму не завжди обов'язковим є наявність конституції як безпосередньо писаного документа (альтернативно-формалізаційна ознака конституціоналізму – авт.). З цього приводу можна навести доктринальну позицію академіка права Ю. М. Тодики, який слушно зазначав, що в «Англії, наприклад, немає писаної конституції, але є конституціоналізм як система демократичних поглядів суспільства, політичної еліти, як суворий порядок, що ґрунтується на повазі прав і свобод людини» [1, с. 126] (константно-гуманістична компонента конституціоналізму – авт.). Своєю чергою, на думку В. Кравченка, політико-правова система конституціоналізму, будучи важливою інституційною та процедурною гарантією становлення, розвитку й функціонування інститутів громадянського суспільства, була і є умовою побудови правової держави [2] (інституційно-процедурна компонента конституціоналізму – авт.).

В теорії конституційного права існує доктринальна позиція, що конституціоналізм сьогоденні охоплює теорію конституції загалом, історію та практику конституційного розвитку певної країни, групи країн (структурно-функціональна компонента конституціоналізму – авт.) [3, с. 27], що завдяки наявності гуманістичного блоку цього нормативно-правового акту, охоплює права, свободи і обов'язки людини, особистості і громадянина. Також конституціоналізм часто-густо розуміють як особливу систему знань про фундаментальні політико-правові процеси демократії, їх сутність, форми вираження, методи й міри реалізації (демократично-установча компонента конституціоналізму – авт.). Тобто, іншими словами, йдеться, що в конституціоналізмі часто вбачали щось на взірць полісемічно-універсального та технологічно-динамічного принципу, який містить у собі низку таких оцінювальних критеріїв, як: розподіл влади, конституційний контроль, принцип верховенства права – отже, такі конституційні інститути, що всі «обертаються» навколо прав людини як основоположного інституту.

Наголошуючи на складності конституціоналізму як суспільно-політичної та державно-правової категорії, основою конституціоналізму визначають ідеали конституційної демократії, наявність певних інститутів влади, політичний режим, що відповідає конституції, а також систему захисту цінностей демократії, прав і свобод людини та громадянина, конституційного ладу загалом (демократично-інституційна компонента конституціоналізму – авт.). [4, с. 39]. Так, дослідник Бабенко К. розглядає конституціоналізм як суспільно-політичну, державно-правову системну категорію, елементи якої тільки в сукупності можуть творити єдиний відлагоджений механізм (системно-установча компонента конституціоналізму – авт.). При цьому складниками системи конституціоналізму він бачить:

1) панівні в суспільстві конституційні ідеї (доктрини) про цінність у державі та суспільстві права й закону, цінність людини, її прав і свобод, честі й гідності, демократії прямої та представницької, участі народу у формуванні органів влади, участі громадян в управлінні державою, ідеї та практичної реалізації розподілу влади, місцевого самоврядування тощо (системно-доктринальна компонента конституціоналізму – авт.);

2) наявність належного нормативно-правового фундаменту (насамперед конституції держави, яка має на найвищому рівні – рівні Основного Закону закріпити всі необхідні для функціонування сучасної демократичної держави інститути) (системно-нормативна компонента конституціоналізму – авт.);

3) наявність відповідного реально існуючого політичного режиму: а) цей режим має відповідати задекларованому в Основному Законі конституційному ладу; б) він повинен мати реально існуючі інститути – прав і свобод людини, прямої демократії (вибори, референдуми), представницької демократії (парламент, органи місцевого самоврядування) тощо (системно-інституційна компонента конституціоналізму – авт.);

4) систему захисту конституційного ладу та конституції тощо [4, с. 38] (системно-гарантуюча компонента конституціоналізму – авт.).

Академік Орзіх М. визначає конституціоналізм як «рух до правової конституційної держави, в якому конституція закріплює головні принципи демократичного конституційного ладу: народовладдя; верховенство права в житті суспільства; підпорядкованість діяльності держави правовим законам; розподіл влади; державний суверенітет; федералізм; політичний плюралізм; різні форми економічної діяльності; світський характер держави; самостійність місцевого самоврядування» [5, с. 17] (системно-засадничий компонента конституціоналізму – авт.). Тобто, фактично йдеться про формування, наявність та діяльність інституційних механізмів, що забезпечують існування та функціонування людини в умовах державно організованого суспільства.

Сучасний американський правознавець Л. Генкін визначає декілька характерних ознак конституціоналізму: а) він ґрунтується на суверенітеті народу, який проголошено конституцією; її найвища юридична сила – результат волевиявлення народу; воля народу є основою легітимації діяльності держави; тільки народ приймає конституцію, створює систему правління та відповідає за її належне функціонування; б) конституція є найвищим правом, а не програмним політичним документом; будь-які дії держави мають відповідати конституції та здійснюватися в межах конституційних обмежень; в) конституція має встановлювати представницьке правління, яке відповідає перед народом на підставі загального всенародного періодичного волевиявлення; г) принцип народного суверенітету не є виключною основою конституціоналізму, мають також дістати юридичні гарантії принципи верховенства права, державного правління на демократичних засадах, а також обмеженого правління, поділу влади із системою стримувань і противаг; цивільний контроль за військовими силами, поліція здійснює свою діяльність на підставі закону, а суд контролює її діяльність; конституціоналізм передбачає незалежність суддів; г) наявність інституту конституційного контролю як судової гарантії конституції; д) дію конституції не може бути припинено або скасовано; конституцію не можуть тлумачити політичні органи та партії; конституцію може бути змінено лише за певною процедурою, яка відповідає встановленій конституційній моделі та забезпечує її жорсткість і верховенство стосовно інших правових актів; е) конституція повинна гарантувати можливість певного маневру, який є необхідним для врахування конституційної традиції країни з метою конституціоналізації фундаментальних цінностей суспільства; є) конституціоналізм потребує від держави гарантії та захисту конституційних прав і свобод, захищає особисті свободи від державного або іншого примусу [5, с. 11] (системно-ідентифікаційний компонента конституціоналізму – авт.). Тут йдеться про основоположні наративно-визначальні та інституційно-превентивні механізми щодо існування людини в умовах конституціоналізму.

Згідно з думкою американського правознавця Л. Фрідмена, конституціоналізм – це: а) живий, верховний закон, втілений у життя країни; б) ставлення суспільства до Конституції; в) демократичні зразки поведінки й інститути, що з'явилися навколо Конституції; г) сукупність громадянських прав, свобод слова і гарантії прав меншинств від переважної більшості [5, с. 12] (гуманістично-ідентифікаційний компонента конституціоналізму – авт.).

Дослідниця профільного феномену Л. В. Соніна вважає, що «конституціоналізм – це політико-правовий режим, що полягає в конструюванні індустріального (постіндустріального) суспільства і встановленні у ньому початку конституційності (гармонії, справедливості) з метою забезпечення його повноцінного існування й розвитку шляхом втілення в праві, правосвідомості, суспільно-державному устрої ідей (цінностей) пріоритету конституційного законодавства, забезпечення людської гідності, прав та свобод людини і громадянина, демократії та децентралізації, сильної державної влади, свободи економічної діяльності, інших ідей (цінностей), а також шляхом виділення в суспільстві соціальних груп, здатних відстоювати названі ідеї (цінності)» [6, с. 76] (соціально-конструктивістський компонента конституціоналізму – авт.).

Своєю чергою, дослідник М. А. Рябінін переконаний, що під конституціоналізмом розуміють вчення про конституцію як обґрунтований інструмент політичного управління державою. На його думку, створена у суспільстві політична система, заснована, насамперед, на конституції та конституційних методах управління державою [7, с. 7] (нормативно-технологічний компонента конституціоналізму – авт.).

Дослідник Ж. А. Бокоев розглядає конституціоналізм у трьох аспектах: 1) як систему (форму) правління, протилежну абсолютизму у формі конституційної правової держави, заснованої на принципі обмеженого правління і приматі прав людини; 2) як варіант політичної

модернізації, що полягає у перерозподілі монархічної влади органам народного представництва; 3) як політико-правовий режим відносин держави і суспільства, який склався в цілому ряді країн, заснований на певному наборі правових принципів [7, с. 13] (типологічно-ідентифікаційна компонента конституціоналізму – авт.).

Цікавим є погляд на конституціоналізм вітчизняних учених-конституціоналістів М. Ф. Орзіха і А. Р. Крусян, які методологічно вірно зазначають, що: «В українській конституційно-правовій науці конституціоналізм не отримав єдиного визначення, тому інтерпретується по-різному. Огляд різних його характеристик дає змогу зробити висновок, що в науці склалися три основні підходи до його визначення: політичний, філософсько-історичний і юридичний» [5, с. 12-18] (сферно-методологічна компонента конституціоналізму – авт.).

Антропологічна та антропоцентрична змістовність феноменології конституціоналізму

На нашу думку, треба насамперед розуміти і зазначити, що незалежно від будь-якого підходу до визначення конституціоналізму, в їх основі лежить не тільки і не стільки конструкція публічної влади, скільки феноменологія антропологізму, а звідси саме антропоцентризм, – причому як в праві взагалі, так й в конституційному праві, зокрема.

Тобто, якщо антропологізм (від антропо... і λόγος –слово, вчення) – є філософською течією, де «людина» стає стрижневою категорією, довкола якої формується система уявлень про буття, природу, суспільство, культуру, істину, добро, благо, обов'язок, свободу, Бога тощо [8], а в нашому випадку – стрижневою категорією в праві (конституційному праві), то антропоцентризм в праві виступає основоположною тенденцією в праві, і особливо в конституційному праві, що лежить і спирається на філософську сентенцію «людина є мірою всіх речей», що трансформується в парадигму управлінської та нормотворчої діяльності держави через розробку і легалізацію конституційно-правового інституту прав, свобод і обов'язків людини (особистості) і громадянина, встановлення, формування, тактичного і стратегічного розвитку і вдосконалення відповідного конституційно-правового статусу людини (особистості) і громадянина (включаючи і інші правові стани людини –іноземство, апатридство, біженство тощо), який визначає суттєві аспекти взаємодії людини і держави, а також демонструє реальне відношення держави до людини [9, с. 35].

Системно-сутнісний підхід та телеологічний аналіз ст. 3 Конституції України [10] наглядно свідчить про те, що саме людина виступає основним суб'єктом-об'єктом конституційного права, «альфою і омегою» державотворчої та правотворчої діяльності, бо:

а) саме вона її життя і здоров'я, честь і гідність, недоторканність і безпека визнаються в Україні найвищою соціальною цінністю (критерій та мета соціально-охоронної пріоритетності людиноцентричності–авт.);

б) права і свободи людини та їх гарантії визначають зміст і спрямованість діяльності держави (критерій та мета основоположної праксеологічної змістовності людиноцентричності – авт.);

в) саме держава відповідає перед людиною за свою діяльність (критерій та мета комплексної облігаторності держави у формуванні людиноцентричності–авт.);

г) утвердження і забезпечення прав і свобод людини є головним обов'язком держави (критерій та мета органічної пов'язаності прав і свобод людини з перманентним обов'язком держави щодо їх реалізації в контексті реалізації людиноцентричності –авт.).

Отже, фактично на конституційному рівні, а також в межах сучасного конституціоналізму, виникає, продукується, формується, реалізується і вдосконалюється феноменологія конституційно-нормативної антропології, що лежить в основі діяльності публічної влади держави, детермінує її телеологічно-соціальне існування та функціонування, скеровує її повсякденну та перспективну діяльність, відповідним чином закріплює найбільш важливі організаційні та організаційно-правові форми її реалізації, фіксує та закріплює гарантії діяльності публічно-правових інститутів з визнання, регламентації, легалізації, регулювання, охорони, захисту, реалізації, гарантування прав і свобод людини. Саме таким чином можна охарактеризувати і розуміти структуру та сутність сучасного конституціоналізму, що має вихід на людину та її правосуб'єктність.

Місцеве самоврядування як основоположна складова феноменології конституціоналізму

Найбільш яскравим прикладом присутності людського фактору в формуванні, функціонуванні і вдосконаленні феноменології конституціоналізму виступає феноменологія місцевого самоврядування (далі – МСВ). Це підтверджується тим, що саме воно несе в собі найбільший системно-комплексний заряд гуманізму та демократії, бо саме:

А) на рівні МСВ,
 Б) в межах територіальної громади,
 В) в умовах філософського стану повсякденності,
 Г) людина не тільки формує і реалізує свій конституційно-правовий статус,
 Г') через формування та відповідних екзистенційних інтересів (по висхідній – від інтенцій, потреб, устремлінь до інтересів – авт.), що в процесі своєї реалізації,
 Д) трансформуються в системи атитюдно-габітусного (поведінково-діяльнісного) прояву, але й

Е) здійснює свій життєвий цикл у індивідуальній, груповій та колективній формах.

Звідси можна констатувати, що саме на рівні МСВ конституціоналізм постає як гуманітарно-гуманістична парадигма діяльності публічної влади щодо реального забезпечення і функціонування людини в умовах державно організованого соціуму [11].

В цьому контексті варто звернути увагу на доктринальну позицію вітчизняного дослідника О. О. Боярського, який вважає, що «інститут МСВ як конституційно-правовий інститут, рівень публічної влади та інститут самоорганізації населення відіграє особливу статусну роль і набуває особливу функціонально-аксіологічну значимість, завдяки своїй полісемічності особливо в контекстуалізації феноменології демократичної правової державності» [12]. Такий висновок дозволив йому виокремити «особливу роль місцевого самоврядування відносно: системи інтересів; публічно-владних інститутів; розвитку локального соціуму; нормативно-правового розвитку соціуму і людини; розвитку інтеграційного потенціалу територіальної громади» [12, с. 209–210].

Особлива та основоположна роль людини в МСВ дав можливість сформулювати та обґрунтувати цьому авторів феноменології «муніципальної людини» [12, с. 183–184]. Таку людину він характеризує:

А) не просто як пасивного статиста (спостерігача) локального соціуму (фактор активності людини в межах територіальної громади – авт.), а

Б) фізичну особу, що не враховуючи її правовий стан (громадянство, іноземство, апатридство, біпатридство, біженство) (фактор нівелювання правового стану людини в межах територіальної громади – авт.),

В) свідомо та ініціативно здійснює свій життєвий цикл в умовах повсякденності (фактор основоположного значення життєвого циклу людини в межах МСВ – авт.),

Г) в рамках територіальної спільноти людей, об'єднаних загальними історичними і сучасними екзистенційними інтересами, цінностями і потребами, що можуть бути реалізованими тільки в умовах МСВ (фактор системності та комплексності у визначенні територіальної громади – авт.),

Г') завдяки спільній синергетичній діяльності людини, територіальної громади, органів місцевого самоврядування та інших суб'єктів та органів місцевого самоврядування, які входять до його системи (фактор синергійності діяльності суб'єктів МСВ в межах територіальної громади – авт.), що

Д) здійснюється на принципах самоорганізації, самодіяльності, самокерованості та самоврядування (засадничий фактор в діяльності територіальної громади – авт.),

Е) з метою створення належних умов для супроводження і забезпечення існування та функціонування людського осередку, що має телеологічну домінанту щодо продовження існування та подальшого розвитку людської цивілізації (телеологічний фактор в діяльності територіальної громади в умовах МСВ – авт.).

Це дає можливість говорити про людинорозмірність МСВ, яка детермінована тим, що саме воно виступає реальною сферою прояву і реалізації прав людини в їх загальному, конституційно-правовому та муніципально-правовому розумінні та значенні [12, с. 194]. Ба більше, саме з МСВ пов'язана й полісемічна феноменологія муніципалізму. Саме тому, обґрунтовуючи авторську концепцію положення людини в МСВ, що становить «комплексне явище, засноване на національній і міжнародній системах визнання, охорони і захисту прав і свобод людини, реалізується на європейському та універсальному рівнях за допомогою договірних та інституційних механізмів» [12, с. 41] та, на основі цього, досліджуючи питання визначення системи координат «людина – місцеве самоврядування», у контексті «вибору між індивідуальним її існуванням та колективним функціонуванням в рамках громади в умовах демократичної правової державності, що відповідають сучасним тенденціям розвитку

муніципального права» [12, с. 107], можна визначити роль людини як основного суб'єкта-об'єкта українського конституціоналізму.

Висновки

Отже, резюмуючи, можна констатувати, що в умовах становлення демократичної правової державності об'єктивується, актуалізується, рефлексується і контекстуалізується проблематика сучасного конституціоналізму, що базується на антропологізації та антропоцентризмі (людиноцентризмі) права взагалі та конституційного права, зокрема. Бо саме в умовах сутнісних процесів демократизації правотворення і державотворення саме людина трансформується в основоположну телеологічну доміную та найважливіший суб'єкт-об'єкт правового впливу, профільної регламентації, регулювання, універсального розвитку, аксіологічної детермінації, релятивістського вдосконалення – результатом чого виступає антропоцентризм в праві. Отже, антропологія, що в широкому сенсі означає «люднознавчий» аспект тієї чи іншої науки, співвідношення тієї чи іншої галузі знання з проблемою людини як соціальної особистості і психофізіологічного істоти [13], – починає суттєво впливати на подальший розвиток і вдосконалення нормативно-правової регламентації і регулювання в державно організованому соціумі, причому ще на стадіях нормопроектної діяльності в процесі ординарної нормо/законотворчості уповноважених суб'єктів, що напряду перманентно впливає на сучасний конституціоналізм у його новелістично-облігаторних ознаках, принципах та формах реалізації.

References

1. Constitution of independent Ukraine: study guide (2000). / [ed. V.F. Pohorilka, Yu.S. Shemshuchenko, V.O. Evdokymov]. Kyiv, 5-8; 47.
2. Babenko K. Development of constitutionalism as an element of modern legal culture in Ukraine (2012). Retrieved from: <http://kaas.gov.ua/law-library/articles/b/417>.
3. Fundamentals of jurisprudence [Text] (2000): teaching. manual / M. AT. Baimuratov [and others]; ed. With. in. Kivalov, M. P. Orzih. Kyiv: Znannia, 358. (Higher education of the 21st century).
4. Babenko K. Constitution as a factor of stabilization and development of the legal and political life of society (2015). Bulletin of the Constitutional Court of Ukraine. 1; 38 - 44.
5. Orzykh M. F. Contemporary constitutionalism: theory and development perspectives / M.F. Orzykh, A.R. Krusyan. Modern constitutionalism: international. scientific and practical magazine (2006). Tiraspol. 1; 12-18.
6. Pushkina E. Constitutional process in Ukraine: problems and judgments (2006): Proceedings of the 3rd International Scientific and Practical Conference "Modern Scientific Research - 2006" (February 20-28, 2006, Dnipropetrovsk): Vol. 4 "Law". Dnipropetrovsk, 76-78.
7. Boryslavska O. M. Methodological approaches to understanding the essence of constitutionalism (2014). Scientific Bulletin of Kherson State University. Series Legal Sciences. Issue 6. (1); 70-74.
8. Kozlovets M.A. Anthropologism. Great Ukrainian encyclopedia. Retrieved from: <https://vue.gov.ua/...BE%D0%B3%D0%B0%20%D1%82%D0%BE%D1%89%D0%BE>.
9. Boychenko I.I., Gumenyuk V.V., Boyarskyi V.A. (2021). Anthropologization and anthropocentrism in constitutional law as the main trend of development and improvement of the constitutional-legal status of a person, individual and citizen. Social kaleidoscope. (2), 75–93.
10. The Constitution of Ukraine: adopted at the fifth session of the Verkhovna Rada of Ukraine on June 28, 1996. Retrieved from: <https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text>
11. Baimuratov M., Kofman B. People-centeredness as a fundamental institutional principle of local democracy (2024). II International Scientific Conference "Innovative Science: Finding Answers to Modern Challenges" (Zhytomyr, Ukraine). 62-68. DOI: <https://doi.org/10.62731/mcnd-05.07.2024.003>
12. Boyarsky O.O. The human dimension of local self-government: constitutional and legal aspects of formation and implementation (2024): diss. Dr. Law of Science. Specialty: 12.00.02 "Constitutional law; municipal law". Kyiv, 550.
13. Anthropology as a science of humanity and its culture. Retrieved from: <https://ru.osvita.ua/vnz/reports/biolog/26424/>.

Mathematical sciences

SOLVING APPLIED WORD PROBLEMS USING TRIANGLES

Akhkajieva Meruert Askarovna

*Graduate student of the Institute of Mathematics, Physics and Informatics of Abay Kazakh
National Pedagogical University*

Research supervisor: Zhumagulova Zauze Abdykenovna

ҮШБҰРЫШТАР АРҚЫЛЫ ҚОЛДАНБАЛЫ МӘТІНДІ ЕСЕПТЕРДІ ШЕШУ

Ахкажиева Меруерт Асқарқызы

*Абай атындағы Қазақ Ұлттық педагогикалық университеті Математика, физика және
информатика институтының магистранты*

Ғылыми жетекшісі: Жумагулова Зауре Абдыкеновна

Abstract

This article discusses the methods of solving practical problems using the properties of triangles. Explain how the geometric and trigonometric properties of triangles are used to solve real-life problems, including in fields such as construction, navigation, and engineering. The article provides examples of solving problems using the Pythagorean theorem, trigonometric relations, the theorems of sines and cosines. The methodology of solving text problems is described with specific steps, and the practical importance of triangles is discussed in the conclusion.

Аннотация

Бұл мақалада үшбұрыштардың қасиеттерін қолдана отырып, практикалық есептерді шешу әдістері қарастырылады. Үшбұрыштардың геометриялық және тригонометриялық қасиеттері нақты өмірдегі есептерді шешуде, соның ішінде құрылыс, навигация, инженерия сияқты салаларда қалай қолданылатыны түсіндіріледі. Мақалада Пифагор теоремасы, тригонометриялық қатынастар, синустар және косинустар теоремаларын пайдаланып есептерді шешудің мысалдары келтірілген. Мәтіндік есептерді шешу әдістемесі нақты қадамдармен сипатталып, қорытындысында үшбұрыштардың практикалық маңыздылығы талқыланады.

Keywords: *Triangles, Pythagorean theorem, trigonometry, theorem of sines, theorem of cosines, construction, navigation, engineering, practical problems.*

Түйінді сөздер: *Үшбұрыштар, Пифагор теоремасы, тригонометрия, синустар теоремасы, косинустар теоремасы, құрылыс, навигация, инженерия, практикалық есептер.*

Үшбұрыштар геометриядағы ең негізгі фигуралардың бірі болып табылады. Олардың қасиеттері нақты өмірдегі есептерді шешуде таптырмас құрал болып саналады. Мысалы, қашықтықты анықтау, бұрыштарды өлшеу сияқты тапсырмалар құрылыс, навигация және дизайн салаларында кеңінен қолданылады. Бұл мақалада үшбұрыштарды қолдана отырып, есептерді шешудің негізгі концепциялары мен әдістері талқыланады.

Тікбұрышты үшбұрыштар және Пифагор теоремасы

Тікбұрышты үшбұрыштардағы негізгі қатынас Пифагор теоремасы болып табылады:

$$c^2 = a^2 + b^2$$

Мұнда:

- c — гипотенуза (үшбұрыштың ең ұзын қабырғасы),*
- a және b — үшбұрыштың катеттері (тік бұрышты құрайтын қабырғалар).*

Пифагор теоремасы бойынша биіктікті немесе қашықтықты табу, көлбеу жазықтықтардағы ұзындықтарды есептеуге болады.

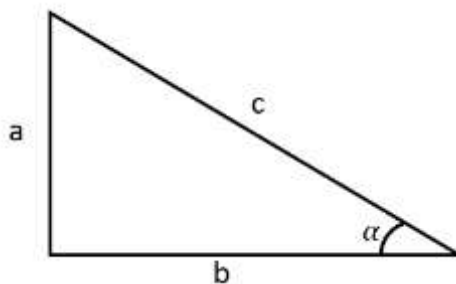
Тригонометриялық қатынастар

Тікбұрышты үшбұрыштарда синус, косинус және тангенс қатынастарын қолдануға болады:

$$\sin \alpha = \frac{a}{c}$$

$$\cos \alpha = \frac{b}{c}$$

$$\operatorname{tg} \alpha = \frac{a}{b}$$



Тікбұрышты үшбұрыштарда синус, косинус және тангенс қатынастарын қолдануда көлбеу бұрыштарды, көлеңкелерді және биіктіктерді табу, жердегі нысандардың арасындағы қашықтықты есептеуді пайдаланамыз[1].

Үшбұрыштың ауданы

Үшбұрыштың ауданы төмендегі формулалар арқылы есептеледі:

1. Негізі мен биіктігі арқылы:

$$S = \frac{1}{2} \cdot \text{негіз} \cdot \text{биіктік}$$

2. Екі қабырға мен олардың арасындағы бұрыш арқылы:

$$s = \frac{1}{2} \cdot a \cdot b \cdot \sin(\gamma)$$

Мұнда a және b — қабырғалар, ал γ — олардың арасындағы бұрыш.

3. Герон формуласы:

Егер үшбұрыштың барлық қабырғалары (a, b, c) белгілі болса:

$$S = \sqrt{p(p-a)(p-b)(p-c)}$$

Мұнда $p = \frac{a+b+c}{2}$ — жарты периметр.

Үшбұрыштың ауданын табу есептері жер учаскесінің ауданын есептеуде және архитектуралық есептеулерде қолданылады[2].

Қалыпты үшбұрыштардағы бұрыштар мен қабырғалар арасындағы байланыс

Егер үшбұрыштың барлық бұрыштары мен қабырғалары белгілі болса, төмендегі формулаларды қолдануға болады:

1. Косинустар теоремасы:

$$c^2 = a^2 + b^2 - 2ab \cdot \cos(\gamma)$$

Мұнда c — үшінші қабырға, a мен b — белгілі қабырғалар, γ — олардың арасындағы бұрыш.

2. Синустар теоремасы:

$$\frac{a}{\sin(\alpha)} = \frac{b}{\sin(\beta)} = \frac{c}{\sin(\gamma)} = 2R$$

Мұнда R — үшбұрыштың сыртқы шеңберінің радиусы.[3]

Үшбұрыштарды қолданудың нақты мысалдары

1. Көлбеу биіктікті есептеу: Мысалы, егер жарық бағанасының ұзындығы белгілі болса және оның көлеңкесінің ұзындығы белгілі болса, тангенс қатынасын пайдаланып бағананың биіктігін табуға болады.

2. Қашықтықты анықтау: Екі нүкте арасындағы көлбеу қашықтықты синус немесе косинус қатынастары арқылы табуға болады.

3. Аудандарды есептеу: Құрылыс алаңдары немесе жер учаскелерінің аудандарын есептеу үшін үшбұрыштардың ауданы формулалары жиі қолданылады.

Есептерді шешу әдістері

1. Пифагор теоремасын қолдану

Мысал есеп 1: Ұзындығы 5 метр баспалдақ қабырғаға сүйеліп, 4 метр биіктікке жетеді.

Баспалдақтың табаны қабырғадан қанша қашықтықта?

Шешімі: $a^2 + b^2 = c^2$, мұнда $c = 5$, $a = 4$

$$b = \sqrt{c^2 - a^2} = \sqrt{5^2 - 4^2} = \sqrt{25 - 16} = 3 \text{ метр}$$

Мысал есеп 2: Алаңда биіктігі 6 метр шам бағанасы бар. Полюстің жоғарғы жағынан жерге дейін сым созылған, оның ұшы қашықтықта орналасқан бағананың түбінен 8 м. Сымның ұзындығын табыңыз.

Шешуі: бұл тікбұрышты үшбұрыш, мұнда:

6 м – бір катет

8 м – екінші катет

c – гипотенуза

Пифагор теоремасы: $c^2 = a^2 + b^2$

$$c^2 = 6^2 + 8^2 = 36 + 64 = 100$$

$$c = \sqrt{100} = 10 \text{ м}$$

Жауабы: сымның ұзындығы 10 м

2. Тригонометриялық қатынастарды қолдану

Мысал есеп 1: Егер ағаштың көлеңкесінің ұзындығы 10 метр, ал күн көкжиектен 30° бұрышпен көтерілсе, ағаштың биіктігін табыңыз.

Шешімі: $\tan \alpha = \frac{\text{қарсы}}{\text{жаңама}}$

$$\text{Биіктік} = \operatorname{tg}(30^\circ) \cdot 10 = \frac{1}{\sqrt{3}} \cdot 10 \approx 5.77 \text{ метр}$$

Мысал есеп 2: Жерге қойылған екі нүкте арасындағы қашықтық 8 м. Осы нүктелерді қосатын арқанның ұзындығы 45° бұрышпен жерге қарай бағытталған. Арқанның ұзындығын табыңыз.

Шешуі: біз тікбұрышты үшбұрышты қарастырамыз. Мұнда:

$a = 8$ м – бір катет,

c – гипотенуза (арқанның ұзындығы)

косинустар қатынасын қолданамыз:

$\cos \alpha = \frac{\text{жаңама катет}}{\text{гипотенуза}}$

$$\cos \alpha = \frac{\text{жаңама катет}}{\text{гипотенуза}}$$

$$\cos(45^\circ) = \frac{8}{c}$$

$$\frac{\sqrt{2}}{2} = \frac{8}{c}$$

$$c = \frac{8}{\frac{\sqrt{2}}{2}} = 8 \cdot \frac{2}{\sqrt{2}} = 8\sqrt{2}$$

$$c \approx 11,31 \text{ м}$$

Жауабы: Арқанның ұзындығы шамамен 11,31 м

3. Синустар заңын қолдану

Мысал есеп. Құрылыс алаңында жұмысшылар екі темір арқалықты 7 м және 9 м ұзындықта кесіп, олардың арасындағы бұрышты 60° етіп біріктіруді жоспарлады. Арқалықтардың бір ұштарын бекіткеннен кейін, екі арқалықтың еркін ұштары арасындағы қашықтықты анықтау қажет. Осы қашықтықты табыңыз.

Шешімі: Косинустар теоремасы:

$$c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$$

$$c^2 = 7^2 + 9^2 - 2 \cdot 7 \cdot 9 \cdot \cos(60^\circ)$$

$$c = \sqrt{49 + 81 - 63} = \sqrt{67} \approx 8.19 \text{ см}$$

4. Мәтіндік есептерді шешу қадамдары

1. Есепті елестету: Берілген есептің сызбасын сызыңыз.

2. Белгілеу: Белгілі мөлшерлерді және бұрыштарды жазыңыз.

3. Формуланы таңдау: Пифагор теоремасын, тригонометриялық қатынастарды немесе синустар мен косинустар заңын таңдаңыз.

4. Шешу және тексеру: Есептеулерді орындап, логикалық дұрыстығын тексеріңіз.

Үшбұрыштардың қасиеттерін білу және оларды практикалық есептерге қолдану көптеген өмірлік жағдайларда, мысалы, құрылыс, инженерия, архитектура және геодезияда пайдалы. Негізгі тригонометриялық формулаларды дұрыс пайдалану арқылы күрделі есептерді де оңай шешуге болады.

Пайдаланылған әдебиеттер тізімі

1. Смирнов В.А., Тұяқов Е.А. Геометрия. Жалпы білім беретін мектептің 8-сыныбына арналған оқулық. – Алматы: Мектеп, 2018. – 160 б., сур.

2. Погорелов А.В. Геометрия. 7-9 классы: учеб. Для общеобразоват. учреждений/ А. В. Погорелов. – 10е изд. – М.: Просвещение, 2009. – 224 с.

3. Смирнов В.А., Тұяқов Е.А. Геометрия. Жалпы білім беретін мектептің 9-сыныбына арналған оқулық. – Алматы: Мектеп, 2019. – 184 б., сур.

**USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN IMPROVING STUDENTS'
ABILITY TO SOLVE LOGICAL PROBLEMS IN MATHEMATICS**

Adilkhanov Olzhas

undergraduate

Kozhasheva G.O.

Ph.D., Associate Professor

**ОҚУШЫЛАРДЫҢ МАТЕМАТИКАДАН ЛОГИКАЛЫҚ ЕСЕПТЕРДІ ШЕШУ ҚАБІЛЕТІН ЖЕТІЛДІРУДЕ
АҚПАРАТТЫҚ-ҚАТЫНАСТЫҚ ТЕХНОЛОГИЯЛАРДЫ ҚОЛДАНУ**

Адилханов Олжас

магистрант

Кожашева Г.О.

п.э.к., доцент

Abstract

Currently, the role of information and communication technologies (ICT) in the education system is increasing. This article discusses the effective use of information and communication technologies in improving the ability of students to solve logical problems in mathematics. ICT tools such as interactive whiteboards, math programs, and online platforms help students develop logical thinking skills, gain a deep understanding of mathematical concepts, and solve complex problems. The article will talk about the role of ICT in the educational process, the importance of increasing student interest and developing independent work skills, and their impact on maintaining a high level of interest in mathematics. The effective use of ICT in mathematics, especially in solving logical problems, provides great opportunities for the development of analytical thinking of students. Using the possibilities of ICT, the learning process of students becomes interactive, interesting and effective.

Аңдатпа

Қазіргі таңда білім беру жүйесінде ақпараттық-қатынастық технологиялардың (АҚТ) рөлі артып келеді. Бұл мақалада оқушылардың математикадан логикалық есептерді шешу қабілетін жетілдіруде ақпараттық-қатынастық технологиялардың тиімді қолданылуы қарастырылады. АҚТ құралдары, мысалы, интерактивті тақталар, математикалық бағдарламалар мен онлайн платформалар, оқушыларға логикалық ойлау дағдыларын дамытуға, математикалық ұғымдарды терең түсінуге және күрделі есептерді шешуге көмектеседі. Мақалада АҚТ-ның білім беру процесіндегі рөлі, оқушылардың қызығушылығын арттыру және дербес жұмыс істеу дағдыларын дамытудағы маңыздылығы туралы айтылып, олардың математика пәніне деген қызығушылығын жоғары деңгейде сақтауға әсері зерттеледі. Математика пәні, әсіресе логикалық есептерді шешу барысында АҚТ-ны тиімді қолдану оқушылардың аналитикалық ойлау қабілетін дамытуға үлкен мүмкіндік береді. АҚТ-ның мүмкіндіктерін пайдалану арқылы оқушылардың білім алу процесі интерактивті, қызықты әрі тиімді болады.

Аннотация

В настоящее время возрастает роль информационно-коммуникационных технологий (ИКТ) в системе образования. В данной статье рассматривается эффективное применение информационно-коммуникационных технологий в совершенствовании способности учащихся решать логические задачи по математике. Инструменты ИКТ, такие как интерактивные доски, математические программы и онлайн-платформы, помогают учащимся развивать навыки логического мышления, глубоко понимать математические концепции и решать сложные задачи. В статье будет рассказано о роли ИКТ в образовательном процессе, важности повышения интереса учащихся и развития навыков самостоятельной работы, изучено их влияние на поддержание высокого уровня интереса к математике. Эффективное использование ИКТ по математике, особенно при решении логических задач, дает большие возможности для развития аналитического мышления учащихся. Используя возможности ИКТ, процесс обучения учащихся становится

интерактивным, интересным и эффективным.

Keywords: logical tasks, solving skills, information and communication technologies, online, interactive whiteboard, artificial intelligence, platforms.

Кілт сөздер: логикалық есептер, шешу қабілеті, ақпараттық-қатынастық технологиялар, онлайн, интерактивті тақта, жасанды интеллект, платформалар.

Ключевые слова: логические задачи, умение решать, информационно-коммуникационные технологии, онлайн, интерактивная доска, искусственный интеллект, платформы.

Өзектілігі: Қоғамның ой-санасының өсуі, жаңа сапалық деңгейге шарықтау кезеңі, еліміздің егемендік алып, әлемнің өркениетті елдерінің қатарына қосылуы жаңа заман жастарынан жаңашылдықты, ізденімпаздықты талап етеді. Бұл орайда математика пәні басты мәнге ие. АҚТ құралдары оқу процесін интерактивті, қызықты әрі тиімді етіп, оқушылардың логикалық ойлау қабілетін дамытуға, оқу материалдарын терең меңгеруге мүмкіндік береді. Математика пәні логикалық ойлауды, талдау мен тұжырым жасауды қажет ететін сала болғандықтан, оның мазмұны мен әдістемесі жаңаша көзқарасты талап етеді. Оқушылардың математикадан логикалық есептерді шешу қабілетін дамыту мәселесі маңызды, себебі бұл қабілет олардың жалпы интеллектуалды деңгейін, аналитикалық ойлауын қалыптастыруға ықпал етеді.

Сонымен қатар, ақпараттық-қатынастық технологиялардың мүмкіндіктері оқу үдерісіне инновациялық әдістер мен құралдар енгізуге мүмкіндік береді, бұл оқушылардың математикаға деген қызығушылығын арттырады. АҚТ құралдарын тиімді пайдалану арқылы оқушылар логикалық есептерді шешудің әртүрлі тәсілдерін үйреніп, өзіндік білім алу дағдыларын қалыптастыра алады. Осыған байланысты, математика пәнін оқытуда АҚТ қолданудың өзектілігі артып отыр, себебі бұл әдіс оқушылардың білім сапасын жақсартуға, оқыту процесін жандандыруға және олардың логикалық ойлау қабілетін арттыруға мүмкіндік береді.

Kipicne

Оқытудың жаңа ақпараттық- қатынастық технологияларын меңгеру – қазіргі заман талабы. Қазіргі қоғамдағы білім жүйесін дамытуда ақпараттық -қатынастық технологиялардың маңызы зор. Соңғы жылдары компьютерлік телекоммуникациялық техниканың және технологияның рөлі мен орны түбегейлі өзгерді. Қазіргі технологияның дамуы мен оның қолданылуының деңгейі материалдық базасының дамуымен ғана емес, оның жаңа білімді игеру және қолдана білу қабілетімен де анықталады. Кейінгі кезде оқыту үдерісінде компьютер, электронды оқулық, мультимедиялық, галамтор сияқты жаңа ақпараттық коммуникациялық технологиялардың дидактикасы мен технологиясы кеңінен қолданылып келе жатқаны мәлім. Оған Э.В. Еврейнов, В.А. Каймин, В.В. Гриншкун, О. Околов, Л.Х. Зайнутдинова, П.С. Булкин, Б.И. Волков, Е.Ы. Бидайбеков, Ж.А. Қараев және т.б ғалымдар мен әдіскерлердің зерттеулері айғақ бола алады.

Жасанды интеллект, сараптаушы жүйелер, логикалық программалау жүйесімен танысу және адамның компьютермен сұхбатын ұйымдастыру үшін құрылған декларативті программалау тілдерінің бірі Visual Prolog. Бұл программа логикалық есептерді шығаруға арналған әмбебап құрал болып табылады. Интеллектісі бар ми интеллектуалды есептерді шешуге бағытталған болса, бұл процесті ойлау немесе интеллектуалды іс-әрекет деп атаймыз. Интеллект және ойлау органикалық түрде теоремаларды дәлелдеу, логикалық талдау, жағдайларды ажырату, іс-әрекетті, ойынды болжау және белгісіздік жағдайында басқару сияқты тапсырмалармен байланысты. Осылайша, интеллект деп мидың қабылдау, еске сақтау және бағытталған түрде білімді оқу барысында түрлендіруді пайдалана отырып тәжірибе және түрлі жағдайларға байланысты бейімдеу негізінде интеллектуалды есептерді шешу мүмкіндігін атаймыз.

Білім беруді ақпараттандыру және пәндерді ғылыми – технологиялық негізде оқыту мақсаттары алға қойылуда. Қоғамдағы ақпараттандыру процесстерінің қарқынды дамуы жан-жақты, жаңа технологияны меңгерген жеке тұлға қалыптастыруды талап етеді. Қазақстан Республикасының «Білім туралы» Заңының 11 – бабының 9 тармағында оқытудың жаңа технологияларын, оның ішінде кәсіптік білім беру бағдарламаларының қоғам мен еңбек нарығының өзгеріп отыратын қажеттеріне тез бейімделуіне ықпал ететін кредиттік,

қашықтан оқыту, ақпараттық-қатынастық технологияларды енгізу және тиімді пайдалану міндеті қойылған.

Негізгі бөлім

Ақпараттық-қатынастық технологиялар — бұл білім беру процесіне жаңа мүмкіндіктер мен әдістер енгізуге мүмкіндік беретін құралдар мен ресурстар. Олар оқушыларға математикалық теорияларды, формулаларды және логикалық ұғымдарды түсінуге көмектеседі. АҚТ-ны қолдану оқушылардың математика пәнін терең түсінуіне, өз бетімен жұмыс істеуге және ойлау дағдыларын жетілдіруге мүмкіндік береді.

Қазіргі таңда елімізде білім беру жүйесінде жаңашылдық қатарына ақпараттық кеңістікті құру енгізілді. Ақпараттандыру жағдайында оқушылар меңгеруге тиісті білім, білік, дағдының көлемі күннен күнге артып, мазмұны өзгеріп отыр. Білім беру саласында ақпараттық-қатынастық технологияларды пайдалану арқылы білімнің сапасын арттыру, білім беру үрдісін модернизациялаудың тиімді тәсілдері пайдаланылуда және одан әрі жетілдірілуде.

АҚТ құралдары арқылы оқушылардың логикалық ойлау қабілетін дамыту үшін арнайы бағдарламалар мен қосымшаларды қолдануға болады. Мысалы, геометрия мен алгебраның негізгі ұғымдарын түсіндіретін интерактивті сабақтар мен виртуалды эксперименттер оқушылардың материалды терең меңгеруіне ықпал етеді.

Интерактивті тақталар мен бағдарламалар. Интерактивті тақталар мен арнайы бағдарламалар оқушылардың сабаққа қызығушылығын арттыруға және олардың математикалық ойлау қабілетін дамытуға көмектеседі. Мұндай тақталар арқылы оқушылар есептерді бірлесіп шешіп, нәтижелерді бірден көреді. Мысалы, Geogebra сияқты бағдарламалар геометрияны оқытуда кеңінен қолданылады. Ол оқушыларға геометриялық фигураларды құрастыру және олардың қасиеттерін зерттеу мүмкіндігін береді.

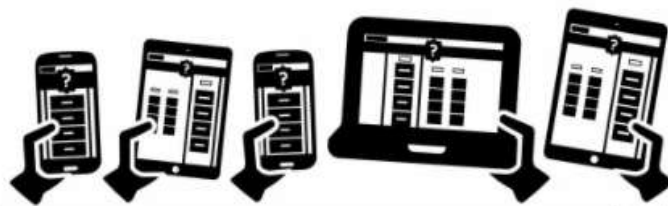
Математикалық онлайн платформалар. Онлайн платформалар мен мобильді қосымшалар оқушыларға математикадан логикалық есептерді шешу барысында қолдау көрсетеді. Мұндай платформалар, мысалы, Khan Academy, Brilliant, Mathway, Quizlet сияқты сайттар мен қосымшалар арқылы оқушылар өздігінен жаттығулар жасап, күрделі есептерді шешу жолдарын үйрене алады. Бұл ресурстар оқушылардың математикаға деген қызығушылығын арттырып, олардың өзін-өзі дамытуына ықпал етеді. Осылардың ішінде бір онлайн платформаға тоқталайық.

Quizlet-бұл онлайн карта генераторы бағдарламасы. Онда визуалды, мәтіндік және дыбыстық қолдануды қолдана отырып, кез-келген пән бойынша карталар жасауға болады.

1. Quizlet полиаспекті қолдану.
2. Навигация және интерфейс.
3. Материалдарды дайындауға жұмсалған оқытушының жұмыс уақытын оңтайландыру.
4. Өзара әрекеттесу режимдерінің әртүрлі нұсқалары.
5. Әлеуметтік медиа интеграциясы және мобильді қосымшалармен үйлесімділік.

Quizlet қосымшасының құралдары мен интерфейсі командалық жарыс форматында қайталауды тиімді және жылдам ұйымдастыруға мүмкіндік береді. Бұл Интернетке қол жетімді интерактивті тақтаны және оқушылардың смартфондарын, сондай-ақ интернетке қосылуды қажет етеді. Сабақта Quizlet-ті сәтті қолдану үшін тек мұғалімге тіркелу жеткілікті. Ойын басталмас бұрын мұғалім Quizlet қосымшасындағы QR кодын интерактивті тақта экранына шығарады, оны студенттер смартфондарымен сканерлейді, осылайша ойынға қатысады.

Оқушылар бір-біріне толық сеніп, дұрыс жауапты табу үшін бірлесіп жұмыс істеуі керек, өйткені жауапты тек бір рет таңдауға болады. Кем дегенде бір рет қателескен команда есепті нөлге теңестіреді және сартқа оралады. Қатысушылардың смартфон экрандарында: сұрақтар мен жауаптар. Осы уақыт ішінде интерактивті тақтада командалар тізімі және олардың жинаған ұпайлары көрсетіледі



Жарыстың ұзақтығы сұрақтардың санына немесе олардың күрделілігіне байланысты. Атап айтқанда, алгебра сабағында бұл іс-шара тапсырма түріне байланысты ұзағырақ уақыт алуы мүмкін. Жарыстың қорытындысына келгенде қатысушылар барлық сұрақтарға тезірек жауап беретін команда жеңеді. Бұл орын алғаннан кейін тиісті ақпарат интерактивті тақтада да, оқушылардың смартфондарында да пайда болады. Ойынның соңында әр команданың қателіктерін жеке-жеке өңдеңіз, өйткені қызмет барлық статистиканы және дұрыс/бұрыс жауаптарды көрсетеді. Төмендегі суретте көрініп тұрғандай есептерді карта түрінде, тест түрінде, қайталау мақсатында беруге болады. Ол сұрақтарды алып, өзі тест, карта, қайталау сұрақ түрінде өзгертеді.



Мұғалімдер үшін тиімді жақтары:

1. Мұғалімнің уақытын үнемдеу - бұл материалды бағдарламаға бір рет енгізу және оны басқа жиынтықтарды құру үшін негіз ретінде пайдалану мүмкіндігі.
2. Әр түрлі топтармен, әр түрлі оқушылармен, әр түрлі деңгейлермен бір рет жасалған жиынтықты бірнеше рет пайдалану.
3. Көшіру, жиынтықтарды біріктіру және жаңа карталар жиынтығын құру мүмкіндігі.
4. Оқытушының өз мәтіндік материалдарын импорттау мүмкіндігі.

Жасанды интеллект. Математиканы оқытуда ЖИ технологияларын пайдалану оқу процесін жеңілдетіп, олардың дағдыларын дамытуға мүмкіндік береді. Жасанды интеллект (ЖИ) логикалық есептерді тиімді шығаруда маңызды рөл атқарады, себебі ол адамға қиын немесе уақытты көп алатын тапсырмаларды жылдам әрі дәл орындауға қабілетті.

ЖИ алгоритмдері үлкен көлемдегі деректерді өңдеп, логикалық заңдылықтарды тауып, нәтижелерді болжам жасау үшін қолданады. Мысалы:

1. Жылдамдық және дәлдік: ЖИ күрделі логикалық есептерді тез арада шешеді, адамның қателіктерін азайтады және шешімдер арасында ықтимал ең тиімдісін таңдауға мүмкіндік береді.
2. Үлкен деректермен жұмыс: ЖИ үлкен деректер жиынтығын талдай отырып, нақты заңдылықтарды анықтап, осы негізде шешімдер ұсына алады. Бұл әсіресе ғылыми зерттеулерде, медицинада, қаржылық талдауда өте маңызды.
3. Оптимизация: ЖИ жүйелері белгілі бір мақсатқа жету үшін ресурстарды ең тиімді пайдалану жолдарын іздеуге қабілетті. Бұл өндірістік процестерде немесе логистикада шешімдер қабылдауды жеңілдетеді.

Логикалық есептерді шешуде жасанды интеллектті қолдануға мысалдар келтірейік.

№1 есеп		№2 есеп	
1 мен 100 аралығында (1 мен 100 қоса алғанда) 1 цифрі неше рет кездеседі. Есептің шешуін ЖИ 1 минутта шығарып берді. Бұл смартфонда орнатылған программада есептің шешуін жазды. Шешуі: 		Алма мен банан сатып алу туралы есеп. Адам 2 алма мен 3 бананға 12 теңге төледі. Сонымен қатар 3 алма мен 2 бананға 13 теңге төледі. Бір алма мен бір бананның бағасын табыңыз. Шешуі: 	

Қорыта айтқанда, жасанды интеллекттің логикалық есептерді шешудегі маңызы — тиімділікті арттырып, көптеген салаларда өнімділікті жоғарылатуға мүмкіндік береді.

Қорытынды

Ақпараттық-қатынастық технологияларды математикадан логикалық есептерді шешу қабілетін жетілдіруде қолдану оқушылардың білімін жаңа деңгейге көтеруге мүмкіндік береді. Оқушылар АҚТ құралдары арқылы математикалық дағдыларды меңгеріп қана қоймай, логикалық ойлау қабілетін дамытады. Бұл әдістер білім беру процесінің тиімділігін арттырып, оқушылардың шығармашылық және аналитикалық ойлау қабілеттерін дамытады. Сондықтан мұғалімдер АҚТ-ны оқу үдерісіне енгізу арқылы өз оқушыларының математикалық білім деңгейін көтеруге қол жеткізе алады.

Сөзімді қорытындылай келе төмендегідей ұсыныстарға тоқталамын:

- кәсіптік білім беретін оқу орындарын қазіргі заманға сай жаңа ақпараттық құрал – жабдықтармен жабдықтау, интерактивті тақталар мен мультимедиялық кабинеттермен және арнаулы пәндер бойынша электрондық оқулықтармен қамтамасыз ету;

- кәсіптік білім саласында оқытудың жаңа ақпараттық технологияларын пайдалану бойынша білім жетілдіру курстарын жиі ұйымдастыру;

Ақпараттық құзіреттілікті қалыптастырудан күтілетін нәтиже жаңа заманға сай ақпараттық мәдениеті мен құзіреттілігі қалыптасқан, теориялық білімдерін іс жүзінде қолдана алатын, информатика пәнін басқа пәндермен байланыстыра алатын жеке тұлға қалыптастыру.

Білім беру жүйесін ақпараттандыру мен ақпараттық қатынастық технологияны оқу – тәрбие үрдісінде пайдалану оқушының өз мамандығына қызығушылығы мен мамандық сапасын арттырып, шығармашылық шабытын шыңдап, ғылыми көзқарасын қалыптастырып, еңбек нарығындағы бәсекеге қабілетті мамандар даярлауда қоғамның даму жолдарын анықтайтыны сөзсіз. Әлемдік жаңалықтардан мағлұматы тез жететін, интернет тілін еркін меңгерген жастар үшін, математикалық жеке ойлау көзқарасы бар, өз ойын пайымдай түйетін жігерлі тұлға болуын, өзіне таныс емес нәрсенің бір қырын ашатын зерттеушілік қабілетін туындауына жәрдемдесетін, білімді де, білікті, көп оқитын, білімін күнделікті ісінде шебер қолдана білетін кәсіби маман иесі болуына ықпал ететінім сөзсіз. Оқушылар XXI ғасырларда қарқынды жаһандану дәуіріне үлес қосатын, сондай-ақ ұлттық экономикаға ықпал етуге әсер ететін мамандықтардың бәрінде математикалық ойлауды қалыптастыратын ұрпақ дайындау бүгінгі күннің міндеті деп білемін.

Пайдаланылған әдебиеттер

1. “Ақпараттық-коммуникациялық технологиялар және білім беру” (авторлар: Н.А. Әбдіқалықова, М.Қ. Шаханов) — 2016 ж Алматы: Қазақ университеті.
2. Ақпараттық технологияларды білім беру үдерісінде қолдану. Алматы: ЖШС “Білім”. Жұмабекова, Г.Н. (2015).
3. Білім беру саласында ақпараттық технологияларды қолдану: теориясы мен тәжірибесі. Вербицкая, Л.И., Симонова, Н.С. (2020). Санкт-Петербург: Бизнес-Пресс.
4. Интернет ресурстарын оқу үдерісінде пайдалану. Мұсабаев, Ә.Е. (2020). Алматы: ЖШС “Білім”.
5. Ақпараттық-коммуникациялық технологиялар және оқытудағы инновациялар. Ермакова, Н.А., Құрманалиева, С.С. (2019). Алматы: Білім.
6. “Цифрлық құралдар арқылы логикалық ойлауды дамыту” (авторлар: А.Қ. Сейітқалиев, Т.Р. Балажанов) — (2019). Алматы: ЖШС “Білім”.

Pedagogical sciences

THE ROLE OF SCAFFOLDING TECHNIQUES IN ADVANCING READING PROFICIENCY

Talapova A.K. ¹

Aitbay A.S. ²

¹ Master of Pedagogical sciences, Kazakh Ablai Khan University of International Relations and World Languages, Almaty, Kazakhstan

² 4th year student, Kazakh Ablai Khan University of International Relations and World Languages, Almaty, Kazakhstan

Abstract

This article explores the role of scaffolding techniques in advancing students' reading proficiency and overall academic success. Based on Vygotsky's Zone of Proximal Development, this approach focuses on providing structured, temporary support to guide learners through challenging tasks. Techniques like breaking down complex activities, previewing vocabulary, and offering step-by-step guidance make reading more accessible and engaging. Through a survey of university students and school teachers, this study highlights the benefits of scaffolding, including improved confidence, motivation, and comprehension. However, it also points to challenges, such as the need for better teacher training and access to resources. The article concludes that scaffolding is a powerful tool for fostering independent learning when applied effectively.

Keywords: Scaffolding, reading skills, student confidence, teacher support, learning strategies, reading comprehension, education tools.

INTRODUCTION

Scaffolding is an educational approach that provides students with just the right amount of support to help them reach a higher level of understanding or skill, often one they couldn't reach alone. It's inspired by the ideas of psychologist Lev Vygotsky, who suggested that students learn best when they're given guidance within their Zone of Proximal Development (ZPD)—the sweet spot between what they can do on their own and what they can achieve with a little help. Scaffolding essentially bridges this gap, helping students grow more confident and capable. As they become more skilled, the teacher gradually removes support, letting the students try more on their own.

In practice, scaffolding can look like breaking down complex tasks, showing examples, or giving hints and prompts to guide students toward understanding. For example, in a reading lesson, a teacher might start by previewing challenging vocabulary or giving background information to make the text easier to approach. During reading, the teacher could ask guiding questions or provide strategies to help students make sense of what they're reading.

Scaffolding is especially valuable for students who may need extra support, like English language learners or those with unique learning needs. Visual aids, step-by-step instructions, or graphic organizers can make it easier for students to break down information and engage with complex tasks without feeling overwhelmed. When students experience success with these supports in place, they often feel more capable and motivated to continue. Scaffolding, then, isn't just about reaching academic goals—it's also about building a positive mindset and encouraging students to believe in their ability to learn and grow.

The key to effective scaffolding lies in understanding when to step in and when to pull back, which requires close attention to how each student is progressing. This responsive approach keeps learning challenging but not frustrating, gradually empowering students to take charge of their own learning journey. In today's classrooms, scaffolding is invaluable for creating a supportive, encouraging environment where all students have the chance to succeed.

Among foreign scientists who made a research on using scaffolding method in reading skills comprehension Ghaleb Rabaah'ah, Eman Safadi, Chanyalew Enyew, Abiy Yigzaw, M.E. Seitova and F.Kh. Makkambayeva made a significant contribution in terms of the usage of scaffolding.

In a 2019 study, Ghaleb Rabaah'ah and Eman Safadi examined how scaffolding instruction impacts reading comprehension for 11th-grade Jordanian students learning English as a foreign language. Over

nine weeks, one group of students was taught using scaffolding techniques, while a control group studied the same material without any scaffolding support.

Chanyalew Enyew and Abiy Yigzaw's (2015) study explored how teacher scaffolding can improve students' reading comprehension. They worked with primary school students and focused on how structured support from teachers could help learners navigate challenging texts and build their understanding step by step. Teachers in the study used methods like asking guiding questions, modeling effective reading strategies, and breaking down the reading process into manageable parts. These techniques aimed to help students gradually take ownership of their learning.

In recent years, scaffolding techniques have become a central component in educational approaches aimed at improving reading proficiency. Grounded in Vygotsky's social constructivist theory, scaffolding emphasizes the idea that students learn best when teachers provide structured, temporary support that allows them to build skills and understanding step-by-step.

The use of scaffolding in reading instruction benefits students of diverse learning backgrounds, including English language learners and those with varying levels of reading ability. Techniques such as previewing vocabulary, discussing background knowledge, and asking guiding questions provide students with a foundation for understanding challenging material, making complex texts more accessible. Additionally, according to the research done by Latson (2022), scaffolding encourages active engagement with the text, which has been shown to support retention and critical thinking skills. When applied thoughtfully, Jones and Brader-Araje (2016) said that scaffolding techniques not only enhance reading proficiency but also help cultivate students' confidence and autonomy in tackling academic challenges.

As research in education continues to underscore the importance of scaffolding in reading development, the approach holds promise for bridging gaps in literacy proficiency across educational settings. Effective scaffolding can be adapted to suit various student needs, making it a flexible and impactful tool for teachers seeking to advance reading skills at all levels. Consequently, understanding the role and application of scaffolding techniques is essential for educators aiming to create supportive learning environments that empower students to succeed independently.

The study by M.E. Seitova and F.Kh. Makkambayeva (2023) explores the role of scaffolding techniques in improving English learners' reading proficiency by enhancing their strategies and attitudes towards reading. The authors emphasize that scaffolding involves guided support provided by teachers, helping students engage with challenging texts by improving vocabulary, pronunciation, and comprehension skills. This approach is particularly effective for learners of English as a foreign language in Kazakhstan, where students often face difficulties with academic texts and maintaining motivation to read.

This study aims to evaluate the implementation and effectiveness of scaffolding techniques in improving reading proficiency among students with diverse learning needs, while identifying the challenges educators face in applying these methods.

The objectives of this study are to analyze educators' understanding and application of scaffolding techniques in reading instruction, assess the perceived effectiveness of these strategies in enhancing reading comprehension and student engagement, and explore their adaptability to meet the needs of diverse learners, including English language learners. Additionally, the study aims to identify the challenges educators face in implementing scaffolding methods, such as resource limitations and lack of training, and to propose recommendations for overcoming these barriers. Emphasis is placed on the potential role of teacher training and technological tools in optimizing the application of scaffolding techniques to improve students' reading proficiency and foster independent learning skills.

To achieve these aims, this study will conduct next three research questions:

1. How do educators perceive and apply scaffolding techniques to support reading instruction and comprehension development?
2. In what ways do scaffolding strategies enhance reading proficiency, engagement, and motivation among students, particularly those with diverse learning needs?
3. What challenges do educators encounter in implementing scaffolding techniques, and how can targeted teacher training and technological tools mitigate these issues to optimize effectiveness?

METHODS

The data analysis in this research employed quantitative research. This quantitative research aimed to explore and explain how the usage of scaffolding techniques help in advancing reading proficiency. Data were gathered through a structured online survey designed to find and capture the understanding

and application, perceived effectiveness, student engagement and motivation, tailoring this technique to student needs and challenges and support in implementation.

The study targeted 3rd and 4th year university Kazakhstan students who are capable of knowing which method is more suitable to use in a classroom, as well as they had an active internship in those 2 years and gained some experience. Researchers made a survey among 20 senior year students of university and among school teachers, who have already gained experience in their field (see Table 1).

The primary data collection instrument was an online survey administered via Google Forms (see Figure 1). The survey included Likert scale questions aimed to assess the understanding and application, perceived effectiveness, student engagement and motivation, tailoring this technique to student needs and challenges and support in implementation. Quantitative data were analyzed through the Excel programme to identify the exact percentage of answers and to summarize participant's responses.

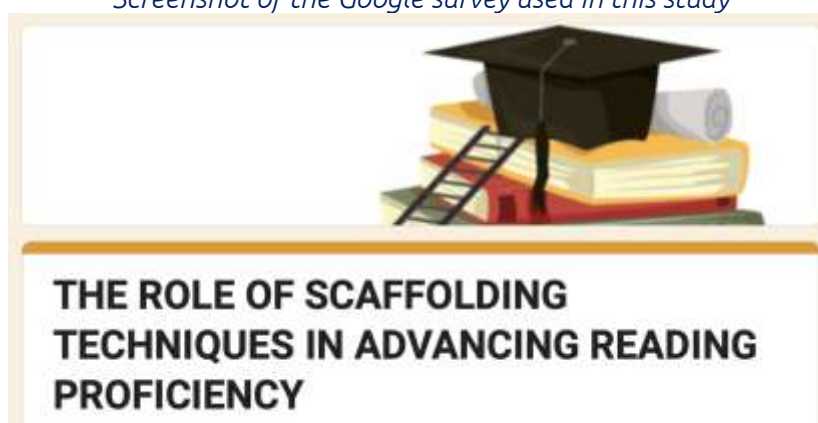
Table 1

Statistical Information of Participants

Age	18-24	25-30	30+	Total
%	65%	20%	15%	100%

Figure 1

Screenshot of the Google survey used in this study



RESULTS

To identify the role of Scaffolding techniques in advancing reading proficiency, a quantitative method was employed. Relying on the analysis of the provided survey, 20 respondents answered 20 questions according to the Likert scale ranging from Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree and questions are divided by categories.

The data gathered from the survey will be presented in the form of tables and below are the tabulated data obtained by the researchers from the questionnaire. The data gathered from the survey identify that participants mostly agree and have neutral opinions about scaffolding. The survey results provide insightful information about the understanding, effectiveness, and challenges of scaffolding techniques in reading instruction. The findings show that respondents generally recognize the value of scaffolding, though there are areas that require further attention to improve its implementation and outcomes.

Respondents demonstrated a good understanding of scaffolding's purpose, with half agreeing and 10% strongly agreeing that it enhances reading proficiency. However, practical integration of scaffolding into classrooms seems inconsistent, as 10% were neutral and 5% disagreed about its application. Additionally, only 45% agreed that teachers are adequately trained in scaffolding strategies, pointing to a potential need for improved professional development (see Table 1).

Respondents demonstrated a good understanding of scaffolding's purpose, with half agreeing and 10% strongly agreeing that it enhances reading proficiency. However, practical integration of scaffolding into classrooms seems inconsistent, as 10% were neutral and 5% disagreed about its application. Additionally, only 45% agreed that teachers are adequately trained in scaffolding strategies, pointing to a potential need for improved professional development (see Table 1).

Table 1

<i>Understanding and Application of Scaffolding</i>							
No.	Statement	SA	A	N	D	SD	Total
1	<i>I understand the purpose of scaffolding in improving reading proficiency</i>	10%	40%	45%	5%	0%	100%
2	<i>Scaffolding techniques are clearly integrated into reading instruction in my classroom</i>	15%	45%	30%	10%	0%	100%
3	<i>Teachers at my institution are adequately trained to apply scaffolding strategies effectively</i>	15%	40%	45%	0%	0%	100%
4	<i>I feel confident in applying scaffolding techniques to support student reading development</i>	15%	35%	35%	15%	0%	100%

The perceived effectiveness of scaffolding was evident in responses. A majority acknowledged its role in breaking down complex reading tasks, simplifying content, and supporting vocabulary previewing. Despite these benefits, its full potential in making reading less intimidating for students appears underexplored, as fewer respondents strongly endorsed this outcome (see Table 2).

Table 2

<i>Perceived Effectiveness of Scaffolding</i>							
No.	Statement	SA	A	N	D	SD	Total
1	<i>Scaffolding helps students understand complex reading materials more effectively</i>	15%	45%	30%	10%	0%	100%
2	<i>Breaking tasks into smaller steps makes reading activities more accessible for students</i>	15%	40%	45%	0%	0%	100%
3	<i>Previewing vocabulary and providing background knowledge improve students' reading comprehension</i>	15%	35%	35%	15%	0%	100%
4	<i>Guided questions during reading sessions enhance students' ability to analyze texts critically</i>	25%	35%	25%	15%	0%	100%

Student engagement and motivation emerged as another critical aspect. Half of the participants agreed that scaffolding encourages active participation, and many recognized its impact on fostering motivation. However, fewer respondents strongly believed that scaffolding strategies reduce reading-related challenges for students, suggesting there is room to make these methods more approachable (see Table 3).

Table 3

<i>Student Engagement and Motivation</i>							
No.	Statement	SA	A	N	D	SD	Total
1	Scaffolding techniques encourage students to actively engage with reading materials	15%	50%	20%	10%	5%	100%
2	Students show greater motivation to read when supported with scaffolding strategies	25%	30%	35%	10%	0%	100%
3	Visual aids and graphic organizers make reading more appealing and less intimidating for students	15%	35%	40%	10%	0%	100%
4	Scaffolding improves students' confidence in their reading abilities	15%	50%	25%	10%	0%	100%

Tailoring scaffolding techniques to diverse learners was seen as essential. While most agreed on their adaptability for different needs, including English language learners and students with varying reading abilities, there was less overwhelming support in the form of strong agreement (see Table 4). This indicates that while scaffolding is viewed as flexible, more efforts are needed to ensure it meets the needs of all learners effectively.

Table 4

<i>Tailoring Scaffolding to Students Needs</i>							
No.	Statement	SA	A	N	D	SD	Total
1	Scaffolding techniques are adaptable to the diverse needs of students, including English language learners	20%	30%	50%	0%	0%	100%
2	Students with varying levels of reading ability benefit from tailored scaffolding strategies	10%	40%	40%	10%	0%	100%
3	Teachers effectively identify when to reduce or remove scaffolding to foster students' independence	25%	25%	35%	10%	5%	100%

The challenges of implementing scaffolding were a recurring theme. Teachers pointed to the lack of resources, additional preparation time, and insufficient professional development as significant hurdles. The potential of technology-based tools, such as interactive apps, was widely recognized, with half agreeing these tools enhance the reading experience. This highlights the importance of incorporating modern, user-friendly tools to streamline scaffolding efforts and address time constraints.

On a broader level, respondents were positive about the impact of scaffolding on students' reading proficiency and academic success. Nearly half agreed, and 25% strongly agreed, that scaffolding plays a crucial role. However, with 25% remaining neutral, it's clear there is still work to be done in building confidence and demonstrating the measurable benefits of scaffolding strategies (see Table 5).

As an overall impact for the "Scaffolding techniques play a crucial role in advancing students' reading proficiency and overall academic success" question, 25% of respondents strongly agree, 45% agree, 25% neutral and 5% disagree (see Table 5).

Table 5

Challenges and Support in Implementation							
No.	Statement	SA	A	N	D	SD	Total
1	Implementing scaffolding techniques requires additional preparation and planning time	20%	40%	15%	15%	5%	100%
2	A lack of resources (e.g., teaching materials, training) limits the effectiveness of scaffolding in reading instruction	20%	30%	40%	10%	0%	100%
3	Teachers need more professional development opportunities to improve their scaffolding skills	20%	35%	40%	5%	0%	100%
4	Technology-based scaffolding tools (e.g., interactive apps) enhance the reading experience for students	20%	50%	25%	5%	0%	100%

Discussion

This research highlights insights into the understanding, effectiveness, and challenges of scaffolding techniques in reading instruction. Respondents generally recognize the value of scaffolding, with 50% agreeing and 10% strongly agreeing that it enhances reading proficiency. However, practical implementation is inconsistent, as 10% of respondents were neutral and 5% disagreed about its application. Moreover, only 45% agreed that teachers are adequately trained in scaffolding strategies, indicating a need for improved professional development. The perceived effectiveness of scaffolding was supported by respondents acknowledging its role in simplifying content, supporting vocabulary previewing, and breaking down complex reading tasks. However, fewer respondents strongly endorsed its ability to reduce the intimidation of reading, indicating its full potential remains underexplored. Challenges such as resource constraints, lack of preparation time, and insufficient professional development were also noted. A notable finding was the recognition of technology-based tools, with 50% agreeing that such tools enhance the scaffolding process, pointing to the importance of integrating user-friendly digital resources.

These findings align with and expand upon existing research. Enyew and Yigzaw (2015) concluded that teacher scaffolding significantly enhances reading comprehension by fostering a structured learning process, which resonates with these data indicating the importance of scaffolding in simplifying tasks. Similarly, Jones and Brader-Araje (2016) emphasized the foundational role of scaffolding in classroom learning, particularly in supporting active student engagement, a theme reflected in these findings regarding its role in encouraging participation and motivation. Safadi and Rababah (2019) demonstrated that scaffolding instruction improved reading comprehension skills, particularly for English learners, paralleling this survey results that highlight its adaptability to diverse learners. However, this research underscores areas for improvement, such as stronger professional development initiatives, which were not prominently discussed in these studies.

Latson (2022) examined scaffolding's effectiveness in breaking down complex tasks and building student confidence in reading, findings that correspond with these data. However, Latson also emphasized measurable academic outcomes, while this study indicates a broader need to demonstrate scaffolding's benefits more effectively to educators, as evidenced by 25% of respondents remaining neutral about its overall impact. Lastly, Seitova and Makkambayeva (2023) explored attitudes towards scaffolding strategies among English learners in Kazakhstan, focusing on adaptability and effectiveness. While these findings similarly recognize scaffolding's flexibility, they also highlight weaker consensus among respondents regarding its application, suggesting room for improvement in aligning strategies with diverse student needs.

The collective research underscores the significant role of scaffolding in enhancing reading comprehension and academic success while pointing to challenges in training, resources, and application that align closely with current survey findings. These similarities and divergences emphasize the ongoing need for targeted efforts to optimize scaffolding strategies across varied educational contexts.

Conclusion

Scaffolding techniques have proven to be an effective way to improve reading skills and empower students in their learning journey. By offering structured support tailored to students' needs, scaffolding helps build confidence and makes complex tasks more manageable. The survey results show that while teachers and students recognize its benefits, challenges like limited resources and insufficient training hinder its full potential. To overcome these barriers, schools should prioritize teacher development and incorporate modern tools to make scaffolding more accessible and effective. When used thoughtfully, scaffolding not only enhances reading proficiency but also prepares students to take on academic challenges independently, fostering lifelong learning skills.

References

1. Enyew, C., & Yigzaw, A. (2015). *Effects of teacher scaffolding on students' reading comprehension*. *Science, Technology and Arts Research Journal*, 4(2), 263–271. <https://doi.org/10.4314/star.v4i2.37>
2. Jones, S. R., & Brader-Araje, L. (2016). *The importance of scaffolding in the classroom*. *Journal of Educational Strategies*, 22(3), 45–52.
3. Latson, R. R. (2022). *Effects of scaffolding on reading comprehension* (Doctoral dissertation, Walden University). ProQuest Dissertations & Theses. ProQuest Identifier: 29064536.
4. Safadi, E., & Rababah, G. (2019). *The effect of scaffolding instruction on reading comprehension skills*. *Journal of Reading Research*, 42(3), 285–300.
5. Seitova, M. E., & Makkambayeva, F. K. (2023). *English learners' attitudes towards developing reading strategies through scaffolding*. Khoja Akhmet Yassawi International Kazakh-Turkish University, Kazakhstan, Turkestan. Retrieved from bulletin-pedagogic-sc.kaznu.kz

METHODS OF TEACHING HIGH SCHOOL STUDENTS TO SOLVE DIFFERENTIAL EQUATIONS

Aitkhozhaeva Zhuldyzai Dilmukhamedovna

2nd year Master's degree student of the
Kazakh National Pedagogical University named after Abai

Zhadraeva Larisa Ushtanovna

Candidate of Pedagogical Sciences, Associated professor the Kazakh National Pedagogical
University named after Abai

Abstract

This article explores effective methods for teaching high school students how to solve differential equations, a critical concept in advanced mathematics. The approach begins with building a strong foundation in related topics such as derivatives and integrals. Emphasis is placed on real-life applications, helping students connect mathematical concepts to practical problems like population growth and cooling rates. Key techniques, such as separation of variables, linear equations, and slope fields, are introduced to provide students with fundamental problem-solving strategies. Additionally, the use of technology, including graphing calculators and software, is integrated to enhance learning through visualization and numerical methods. Active learning strategies, including group work and problem-solving sessions, further support student engagement and comprehension. This approach gradually introduces more complex topics, such as systems of differential equations and partial differential equations, ensuring a comprehensive understanding of the subject. By breaking down complex concepts into manageable steps and providing sample practice, this method fosters a deeper understanding and confidence in solving differential equations.

Keywords: active learning, linear equation, comprehensive understanding, visualization, complex concept, integral, derivative

Introduction

Teaching high school students how to solve differential equations can seem daunting, but with the right methods and tools, these concepts can become accessible and even engaging. Differential equations form the foundation for understanding many natural phenomena, from physics to biology, and mastering them can open doors to advanced studies in mathematics and science. Here are some effective methods for teaching high school students how to solve differential equations:

1. Introduce the Concept with Real-World Applications

Before diving into the technicalities of solving differential equations, it's essential to build context by introducing real-world examples where these equations are applied. For high school students, using familiar concepts can make the abstract idea of differential equations more relatable.

Population Growth: Introduce the exponential growth model, where the rate of change of a population (say, bacteria or animals) is proportional to the population size itself.

Newton's Law of Cooling: Explain how the rate of temperature change of an object is proportional to the difference in temperature between the object and its surroundings.

Simple Harmonic Motion: Demonstrate how the motion of a spring or a pendulum can be modeled using second-order differential equations.

These examples make the process of solving a differential equation feel less abstract, helping students see the relevance of learning how to solve them.

2. Start with Basic Concepts and Terminology

Before delving into the methods for solving differential equations, students need a solid understanding of the fundamental concepts and terminology:

- **Differential:** The concept of a rate of change, for example, velocity as the rate of change of position.
- **Ordinary vs. Partial Differential Equations:** Clarify the difference between ordinary differential equations (ODEs), where the unknown function depends on one variable, and partial differential equations (PDEs), where the function depends on multiple variables. High school students typically deal with ODEs.

- **Initial Conditions:** Introduce the idea of initial conditions or boundary conditions in solving differential equations, explaining how they help determine a unique solution.

Building a foundation in these areas ensures that students understand the structure and purpose of differential equations before tackling specific methods for solving them.

3. Teach by Simplifying Types of Differential Equations

Once students have a grasp of the terminology, introduce them to simple types of differential equations and teach methods to solve each one. Some of the easiest forms are:

- **Separable Equations:** Teach students how to recognize and solve separable equations, where the variables can be separated on either side of the equation.

Example:

$$\sin(x)dx = y \sin(x)dy$$

Separating gives $1 = \sin(x) y dy = \sin(x) dx$, which can then be integrated.

- **First-Order Linear Differential Equations:** These can be written in the form $dx dy + P(x)y = Q(x)$. Teach students to solve these using the integrating factor method. The integrating factor is $e^{\int P(x)dx}$, which is then multiplied through the equation to make it easier to integrate.

The integrating factor allowing the equation to be simplified and solved.

- **Homogeneous Equations:** These equations have the form and they can often be solved using a substitution that simplifies the equation into a separable form.

4. Use Graphical Methods and Technology

Graphical methods and technology, such as graphing calculators or software like GeoGebra, can help students visualize solutions to differential equations. For example:

- **Slope Fields:** Use slope fields (also known as direction fields) to help students understand the behavior of solutions to first-order differential equations. A slope field provides a visual representation of the direction of the solution curve at any given point, helping students develop intuition about the general solution of a differential equation.

- **Numerical Solutions:** For more complicated equations that don't have straightforward analytical solutions, teach students to use numerical methods like Euler's method or the Runge-Kutta method. These methods approximate solutions by iterating over small steps, and students can implement them in tools like Python or MATLAB.

5. Promote Step-by-Step Problem Solving

When teaching students how to solve differential equations, emphasize the importance of a methodical approach:

Identify the Type of Differential Equation: Is it separable, linear, or homogeneous?

Simplify the Equation: Try to isolate terms and reduce the complexity of the equation (e.g., separation of variables or substitution).

Integrate: Solve by integration, paying attention to constants of integration.

Apply Initial Conditions: Use initial conditions to solve for constants and find the particular solution.

Check the Solution: Verify the solution by substituting it back into the original equation.

Encouraging students to approach problems step by step helps reduce confusion and ensures that they master each part of the solution process.

6. Collaborative Learning and Peer Teaching

Differential equations can be challenging, so fostering a collaborative learning environment is crucial. Encourage students to work in pairs or small groups to solve problems. Peer teaching, where students explain concepts to each other, can reinforce their understanding and clarify misunderstandings.

In-class activities like group problem-solving or having students present their solutions to the class help them learn from one another. This approach promotes discussion and a deeper understanding of the material.

7. Provide Practice with a Range of Problems

The key to mastering differential equations is practice. Provide students with a variety of problems that increase in difficulty, allowing them to apply what they've learned to different types of equations. Include:

- Simple separable equations
- First-order linear equations
- Word problems based on real-life scenarios
- Problems that require the use of numerical methods for solutions

By offering a mix of problems, students can develop confidence and skill in applying various techniques to solve differential equations.

8. Focus on the Importance of Conceptual Understanding

Finally, encourage students to develop a conceptual understanding of the underlying principles of differential equations. Rather than merely memorizing methods, they should understand why certain methods work, what the solution represents in real-world terms, and how different types of differential equations relate to each other. For instance:

- Why is the exponential growth model proportional to the population size?
- What does the solution to a Newton's law of cooling equation tell us about the temperature over time?

Fostering conceptual understanding helps students retain the material and apply it more effectively in future studies.

Conclusion

Teaching high school students to solve differential equations is a process that requires patience, creativity, and a step-by-step approach. By using real-world examples, emphasizing understanding over rote memorization, incorporating technology, and providing ample practice, students can master the techniques needed to solve these important equations. With these methods, high school students will not only be able to solve differential equations but also gain an appreciation for their real-world applications and their role in the broader field of mathematics.

Real-World Connections Provide examples from real life where differential equations are used:

Population growth models (exponential growth or decay),

Radioactive decay (which follows an exponential model),

Newton's Law of Cooling (temperature change over time),

Simple Harmonic Motion (springs and pendulums).

This helps students see the relevance of the subject, making the abstract concepts more tangible.

References

1. Braun, M. (1993). *Differential Equations and Their Applications* (4th ed.). Springer.
2. Boyce, W. E., & DiPrima, R. C. (2009). *Elementary Differential Equations and Boundary Value Problems* (9th ed.). Wiley.
3. Hochbruck, M. E., & Götz, A. M. (2009). *Differential Equations: A Modeling Approach*. Springer.
4. McDonald, A. H. (2003). "Using Technology to Enhance the Teaching and Learning of Differential Equations." *International Journal of Mathematical Education in Science and Technology*, 34(3), 325–337.
5. Meadows, D. H. (2000). "Teaching Differential Equations through Application: A Fresh Approach." *International Journal of Mathematical Education in Science and Technology*, 31(6), 725–736.

THE ROLE OF PROFESSIONALLY-ORIENTED PROBLEM-BASED TASKS IN THE TRAINING SYSTEM OF A FOREIGN LANGUAGE TEACHER

Mansurova Aizhan

South Kazakhstan Pedagogical University

Abstract

The article examines various approaches to language learning, with a view to enhancing existing knowledge and abilities, as well as fostering independent and critical evaluation of one's capabilities in this domain. It also elucidates the advantages of each of the aforementioned approaches to language learning.

It is of the utmost importance to provide adequate training for those engaged in the teaching of foreign languages, and this should be a matter of significant concern. The ability to communicate in a foreign language is becoming not only an important skill, but also a necessity for successful professional activity in most areas. Modern societies are becoming increasingly multilingual. Ability to communicate in several languages opens up new opportunities for personal and professional development. Foreign language teachers play a key role in developing the necessary language skills and cultural competence in their students. The quality of teacher training is a significant concern in the context of global education systems. It encompasses not only linguistic proficiency but also pedagogical expertise, the capacity to utilise a range of instructional resources, and the ability to respond to the distinctive requirements of learners.

The incorporation of professionally oriented learning tasks is a crucial element in the preparation of students for the realities of the workplace, facilitating the development of the requisite skills and competencies. In the workplace, there are often situations that demand quick thinking and decision-making in uncertain circumstances. In general, tasks oriented towards professional development constitute an essential component of educational process, enabling students to prepare for the challenges of their future profession by developing the requisite knowledge and skills.

*The training of foreign language teachers is a complicated and multifaceted process that necessitates the use of various models and approaches. Problem based tasks is one of the most effective methods of training future teachers, as it actively involves students in the process of solving real pedagogical problems. This paper will consider some existing models and approaches to training of foreign language teachers, with an emphasis on problem-based learning. In his book, *Problems of Second Language Acquisition*, Michael Long puts forth a methodology for fostering a systematic and consistent focus in the process of second language acquisition. This approach is informed by philosophy of science and employs a systematic inquiry framework. The book is divided into three sections: theory, research and practice. This structure enables readers to focus on areas of SLA that are of interest to many in this field. These include theory proliferation and comparative theory evaluation, the Critical Period Hypothesis, negative feedback, and the practice of teaching languages using "synthetic" language. The book of problem-oriented tasks for future teachers N. Dmitrenko, A. Petrov, O. Tsigun, justified the effectiveness of formation of communicative skills of future teachers with the help of problematic tasks. The objective of the experimental research was to identify the cognitive and communicative needs and opportunities of students in addressing problematic tasks. Research comprised a series of practical training exercises, diagnostic tests and interviews with both students and teaching staff. The results clearly demonstrated the cognitive, organizational, and opportunities of students to resolve problematic tasks. Regular use of problem-based learning is shown to have a positive impact on the development of language competence in students, as revealed by the experiment's data. It has been observed that the development of phonetic, lexical, and grammatical abilities is linked to the practice of peer communication and the capacity for self-control in problem-solving.*

*In his book *Project-Based Learning in Second Language Acquisition*, Adrian Gras- Velazquez examines the potential of project-based learning as a pedagogical approach in the context of second language acquisition, considering its applicability in a range of diverse learning environments. Project-based learning (PBL) is a social practice through which students are socialised through a series of group activities that involve the simultaneous acquisition of language, content and skills.*

In essence, an approach elucidates the process of language acquisition and offers methodologies for facilitating learning. These encompass the utilisation of classroom activities and techniques to assist learners in attaining proficiency.

Students with lower proficiency were able to exceed their basic language skills through the project's facilitation of engagement in authentic conversations in interactive settings. Students demonstrated notable progress in their linguistic and sociocultural understanding, and they reported increased comfort with the language. This was in part due to the nativespeaker's linguistic accommodations for the learners. Those with a high level of proficiency were able to identify and cater to the varying needs of a novice speaker with ease, including vocabulary, language structure. This enabled language learners to enhance their language skills and feel adequately prepared to communicate without fear of judgement. By interacting with nativespeakers, students were able to enhance their language abilities in a social context, which cultivated a sense of belonging and encouraged them to take risks as less-experienced speakers.

The role of professionally-oriented tasks Michael Long's contributions to the field of linguistics are numerous and significant. Among his most notable achievements is his work on the teaching of language based on tasks (TBLT). Task-based language teaching is an approach that entails the assignment of a task or goal to be achieved by students at the conclusion of the

class period. This approach to language learning commences with an analysis of the needs of students in question. The materials comprise a series of pedagogical assignments, ordered according to degree of complexity of assignment, rather than linguistic complexity. It is essential to provide assignments that will assist students in real-life situations and facilitate development of the requisite skills. The language must be meaningful and used for specific purposes, such as ordering a coffee, buying a ticket or going to an interview. Problem-based language learning ensures students understand that language is more than just words on a page. The use of interactive materials ensures that students will be able to apply their knowledge they have learned to real-world contexts.

The tasks should be:

- Focused on meaning*
- Learner-centered*
- Goal-oriented*
- Flexible*
- Authentic*
- Experimental*

Potential assignments include:

- The process of making reservations for a hotel room, vehicle rental, dining establishment, or tour.*
- Lots of input to learn vocabulary, expressions and grammar associated with doing reservations (reading, listening, watching)*
- Guided output (speaking, group work, writing)*
- More free output (role-plays)*

Task-based learning requires more time, planning and creativity, but it is a highly rewarding experience to work with students.

Project based learning

Project-based learning (PBL) is an effective means for promoting purposeful language learning, content learning, and community engagement. A five-step structure has been developed to serve as a guide for foreign language teachers in the planning, implementation and evaluation of PBL. The framework has the potential to be adapted for a number of different contexts, including second, foreign, and additional language settings; young, adolescent, and adult learners; learners with a range of language aims, including general, academic, vocational, and social; various student configurations (individual, pair, group); diverse language-skill emphases; and different time frames.

Stage 1: Preparation Cycle

The preparation cycle involves choosing a project theme, topics, and a plan for completion. When deciding on themes and topics, the aim is to identify those that further the course objectives. Effective projects focus on topics that students think are relevant to their communities, learning and life; they are supported by numerous resources; they arouse student curiosity; motivate students; and have the potential to make students feel proud.

Stage 2: Information Gathering Cycle

After making decisions, students start collecting information (step 2). The types of information collected and the methods used to collect it vary, as do the detailed instructions provided by teacher to

prepare students for success at this stage. What and how teachers use is inextricably linked to the course's objectives and students' needs in language learning.

Stage 3: Information Processing Cycle

In the third stage, students are involved in processing information collected in step 2. Regardless of what types of information were collected, students benefit from processing this information. To prepare students for success at this stage, comprehensive learning can help students refocus their projects to solve organizational problems; analyze the information collected; distinguish between current and less current information; retain current information and exclude the rest; change information using tables, note cards, diagrams to identify characteristics and categories; generalization; decision on whether additional information is needed.

Stage 4: Information Display Cycle

In the 4th stage, students share the project results with teacher and other audiences.

Teacher includes in-class training to assist students in the final determination of project results and then show them (for example, show written documents, participate in poster fair, give PowerPoint presentations, participate in debates)

Stage 5: Reflections Cycle

Teachers and students generally see Phase 4 as the logical completion of the project. It is at the end of stage 4 that teachers usually give grades for final results. In this

final stage, with support of teacher, students reflect through discussion, diary entries or meditation on what they have learned from participating in the project in terms of content, skills.

The use of case studies is an effective method for project-based learning

In the video project "Imitation Speech", students have the opportunity to gain insight into various aspects of speech, including word stress, sentence stress, intonation, and connected speech. To engage with this project, students are encouraged to select a video of a person they find inspiring and emulate their speech in their own videos. After the project is completed, students will be able to identify and name different pronunciation features and modify their own pronunciation accordingly. They will also be able to analyse the pronunciation of different speakers in one- or three-minute segments of popular movies. Once the students have completed their videos, they enjoy a "video day," during which they have the opportunity to compare their original videos with those of their peers

There are several key similarities between project-based learning, task-based learning and case studies. All three methods involve students actively engaging in learning, rather than just receiving information passively. These approaches focus on applying theoretical knowledge in real situations. All three methods frequently involve group work, which is an effective way to develop communication and interaction skills among students. These methods are particularly useful in the context of foreign language learning, where it is not only important to know grammar and vocabulary, but also to be able to apply them in real-life situations.

References

1. Michael Long. *Problems of Second Language Acquisition*. 2017.
2. Adrian Gras-Velazquez. *Project-Based Learning in Second Language Acquisition*. 2019.
3. www.perlego.com
4. Google Scholar www.scholar.google.ru

COMPARISON OF DYNAMIC ASSESSMENT AND TRADITIONAL ONE

Dilnaz Temirbekova

South Kazakhstan Pedagogical
University named after U.Zhanibekov, Shymkent, Kazakhstan**Abstract**

This article compares dynamic assessment (henceforth, DA) with traditional assessment. By revising the experiments and opinions of other researchers, both the advantages and disadvantages of both assessment types were revealed. Briefly, DA is not well known and investigated among psychologists and educators. Therefore, there are not many studies about its advantages and disadvantages. However, DA is not suitable for large classes and is hard to use in final grading.

On the other hand, it is best to focus on the learning process itself and give individual feedback to every learner. In terms of the traditional one, it is used widely in the education field, owing to its reliability and lightness in creation. In fact, it is not possible to find the best assessment type and approach in every classroom. Every single one has its best and weak sides. Therefore, every educator must find the one that suits them right individually.

Keywords: morphological analysis, language teaching, zone of proximal development, scaffolding, vocabulary development.

Introduction

Nowadays we have dozens of approaches and methodologies which are very useful and widely used in the teaching process. Certainly, there are similar ones. However, similarity is not equal to identity. It applies to the Zone of Proximal Development (henceforth, ZPD) and Dynamic Assessment. Although this is not the main topic of the article, differentiating them before delving into the world of DA is crucial.

ZPD and DA are contextualized by the same psychologist Vygotsky. Due to this, they have similar concepts, some of which will be stated further: 1) both require help from the adults through interaction: 2) prioritize acknowledging learners' potential for their further growth and understanding, not for their current knowledge: and 3) need scaffolding.

On the other hand, differences are 1) ZPD is just a theoretical concept, whilst DA is a practical assessment method: 2) ZPD is used mostly for learning, but DA is for assessment: In summary, ZPD answers the question of "Why?" whilst DA requires "How?". Therefore, in DA students may ask questions when it is needed. But the final product must be done by themselves. In other words, teachers help them in the beginning. When it comes to the ZPD, adults help them throughout the learning process. That is why it is used in theoretical knowledge, not in assessment.

As it was stated by Haywood (1992), the main goal of DA is to assess processes of thinking that are constantly changing. In essence, it concerns changes in all aspects, like thinking, perception, learning, and so on. By giving the tasks striving to make changes in all of these fields, we want to make sure changes happen in a way of solving the problems.

Nevertheless, traditional assessment deals with the ordinary ways of assessment. Talking about traditional assessment often means referring to formal tests that check students' ability to recollect and reproduce the content studied during a course (Coombe et al, 2012). That is often used in final tests. Moreover, usually, that refers to multiple-choice tests, true/false, generally, tests which are taken with paper and pen. Here, all learners receive the same test type for each and every one. Which was not specifically designed based on their skills, strengths, and individual features. At the end of the exam, students often receive just the score. Therefore, its reliability is high in comparison to the DA. For that reason, this type of assessment is directed to the product rather than the learning process.

By contrast, DA focuses on what kind of knowledge that child had before the lesson and how they can learn after the lesson. A little example is the roots of the words. In languages like Korean and Chinese, this phenomenon is very clear.

Hanja is a writing system that uses Chinese characters in the Korean language. It is more noble than just other words without roots because roots contain certain meanings in them. Several roots form meaningful words altogether. Learning roots help you to learn other words faster since the base or root will be the same or similar. For instance, 教 origin means "to teach". In Korean it is written as 교.

Therefore, to see connections with other words, search for this character in other words. One may encounter that in words like 학교 (learn+education location=school), 대학교 (large+education location=university), 교내 (learn+inside=inside a school), 교복 (school+clothing=uniform). As is seen from the example, 교 refers to school and teaching. Therefore, everytime time a person meets a new word that has that origin, they will immediately know that it is somehow related to teaching or school.

An article published by the Classtime.com site states that one of the major advantages of traditional assessment is its objectivity. By virtue of standardized questions and grading systems which were set in advance, there is no room for biasing. Additionally, it is a way easier for teachers to check that.

However, in terms of the drawbacks of this assessment, there are several things to say. Firstly, this is not the best style for everyone. Those who do better in practical sessions or oral exams, may not suit. Also, the pressure during the test time is not favorable for many people. By contrast to the non-traditional one, where questions capture problem-solving and creativity ranges, this one faces limitations. Since memorization and retelling are the methods that are used in this type of exam.

The advantages of DA are plentiful. Firstly, it helps with identifying students' real mental age, not physical. There was an experiment by Vygotsky (1986/1934) with two eight-year-old boys. The full version of that experiment is shown below:

Most of the psychological investigations concerned with school learning measured the level of mental development of the child by making him solve certain standardized problems. The problems he was able to solve by himself were supposed to indicate the level of his mental development at that particular time. But in this way, only the completed part of the child's development can be measured, which is far from the whole story. We tried a different approach. Having found that the mental age of two children was, let us say, eight, we gave each of them harder problems than he could manage on his own and provided some slight assistance: the first step in a solution, a leading question, or some other form of help. We discovered that one child could, in cooperation, solve problems designed for twelve-year-olds, while the other could not go beyond problems intended for nine-year-olds. The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development; in our example, this zone is four for the first child and one for the second. Can we truly say that their mental development is the same? Experience has shown that the child with the larger zone of proximal development (ZPD) will do much better in school. This measure gives a more helpful clue than mental age does to the dynamics of intellectual progress. (pp. 186–187)

As we can see from here, it helps to measure students' mental opportunities and real mental age. Generally, students' mental age is not equal to their physical one. And this is proven in the experiment.

However, in agreement with H. Carl Haywood & David Tzuriel (2002), show only the possibility of the future outcome. Without proper scaffolding, it is impossible to reach that level. Therefore, teachers must always be there for them. That is why it is hard to implement and time-consuming. When it comes to replacing it with a traditional assessment type, the question is whether people can devote enough time to have done it. Additionally, by Elliot (1993) DA is not a new assessment type, yet it is not completely researched and known to many educators. Also, the amount of resources is limited and requires fewer people in the class. Usually, it is hard to find the right resources which meet the requirements of DA. Since it requires constant additional teacher training, it is not always impossible to arrange that. The reason why it is hard to implement DA in large classes is the need for individual feedback. Often it is physically hard to memorize everyone's weak and strong sides and adjust the class materials for that. This is the reason why many educators do not use this assessment type widely.

Conclusion

In conclusion, the DA assessment type requires a plethora of diligence and is not famous among educators and psychologists. The reasons for that are numerous. According to H. Carl Haywood & David Tzuriel's (2002) research, firstly it needs to be taught in graduate schools. Next, in schools, teachers need to put final grades, since it requires plenty of perseverance and time usually they use just the traditional form. From that point on this assessment form is not researched profoundly, a young generation must pay attention to analyze this. Although this approach helps enhance vocabulary, the exact time it will be fully achieved has yet to be discovered. Hence, I recommend exploring this point in the further studies.

References

1. Haywood, H. C., & Tzuriel, D. (2002). Applications and Challenges in Dynamic Assessment. *Peabody Journal of Education*, 77(2), 40–63. https://doi.org/10.1207/S15327930PJE7702_5

2. Muhamad, S. (2024). *A study on student's learning achievement with traditional assessment and portfolio assessment*. *Jurnal Cahaya Mandalika* ISSN 2721-4796 (Online), 5(1), 59–73. <https://doi.org/10.36312/jcm.v5i1.2587>
3. Mirzaei, A., Shakibei, L., & Jafarpour, A. A. (2017). ZPD-based dynamic assessment and collaborative L2 vocabulary learning. *The Journal of Asia TEFL*, 14(1), 114–129. <https://doi.org/10.18823/asiatefl.2017.14.1.8.114>
4. Nobre, V. (2021, January 11). *Traditional assessment and its characteristics*. *New Routes*. <https://newroutes.com.br/cover-topic/traditional-assessment-and-its-characteristics/>
5. Dikli, S. (2003, July). *Assessment at a distance: Traditional vs. alternative ...* *The Turkish Online Journal of Educational Technology*. <https://files.eric.ed.gov/fulltext/EJ1101956.pdf>
6. Ibs. (n.d.). *Hanja Roots*. *Hanja roots > korean language > overview > IBS*. https://centers.ibs.re.kr/html/living_en/overview/korean6.html
7. *Why traditional assessment still matters: An overview. Why Traditional Assessment Still Matters: An Overview.* (n.d.). <https://www.classtime.com/en/traditional-assessment#:~:text=One%20of%20the%20major%20advantages,in%20a%20time%2Defficient%20manner.>

INNOVATIVE APPROACHES TO ECONOMIC MANAGEMENT: THE ROLE OF DIGITAL EDUCATIONAL TECHNOLOGIES IN THE GREAT STONE "INDUSTRIAL PARK"

Jingjing Fang

*International Sakharov Environmental
Institute of Belarusian State University, Minsk, Belarus*

Abstract

The article discusses modern digital educational technologies and their application in economic management using the example of the Great Stone Industrial Park. The author analyzes the role of digitalization in the educational process for the development of professional competencies necessary in a rapidly changing economic environment. The influence of digital technologies on the efficiency of management in industrial parks, as well as the possibility of integrating educational platforms into the system of professional training, is being investigated. Based on empirical data on the activities of the Great Stone Industrial Park, key aspects such as innovative teaching methods, the use of big data and artificial intelligence in management, as well as their impact on the strategic development of the park are discussed. In conclusion, the need to adapt educational programs to the requirements of the modern labor market and new technological realities is emphasized. Thus, the updating of educational programs with an emphasis on digital technologies not only meets the requirements of the time, but also creates the basis for the sustainable development of the Great Stone Industrial Park and its participants. This approach contributes to the formation of an advanced human resource base, which ultimately stimulates the economic growth of the state.

Keywords: *economic management, digitalization of education, industrial park, innovative teaching methods, e-learning, vocational training, information technology, sustainable development.*

Introduction. *The modern world is changing rapidly, and the economic sphere is no exception. The economy today places high demands on the professional competencies of personnel, giving preference to those who have not only knowledge, but also developed digital skills. In conditions when a person becomes a key element of the digital economy, education acquires not only the value of a public good and basic human rights, but also a strategic priority for the development of society. The changes taking place today in the labor market demonstrate that modern specialists need not only deep theoretical knowledge, but also the ability to effectively use digital tools.*

Digitalization is becoming a key factor in socio-economic development, and digital educational technologies are an integral part of this process. They not only improve the quality of education, but also significantly influence the management of economic development, opening up new horizons for growth. In this context, the introduction of digital technologies into the educational process becomes not just desirable, but a necessary condition for the training of competitive professionals. It is important to understand that the digital revolution is not limited only to the technical side. It requires in-depth research in the field of digitalization of education, artificial intelligence, machine learning, cybersecurity, as well as in the field of digital business models and economics. It is necessary to create and develop research centers capable of generating new knowledge and technologies that will form the basis for future socio-economic innovations. The relevance of the study lies in the fact that educational programs not only must be adopted to market, but they, at the same times, give new opportunities for social and economic development.

The purpose of the article is to identify the impact of digital educational technologies on the management of economic processes. To achieve this goal, specific examples of the use of such technologies in the Great Stone industrial park were analyzed; an assessment of the results of the introduction of digital educational technologies and their impact on the efficiency of managing economic processes is given.

Methods. *The theoretical and methodological basis of the work included: review of existing publications and research in the field of digital educational technologies and economic management; study of methods and approaches used in modern research on this topic; case method when choosing the Great Stone industrial park as a research object; collection and interpretation of data on the digital*

educational technologies used in this park. Based on the research, conclusions were formulated about the importance of digital educational technologies in the management of economic processes using the example of the Great Stone industrial park, and recommendations were proposed for improving educational programs and management methods.

Results. *In the context of the rapid development of digitalization and automation of production processes, which leads to the complete or partial disappearance of a number of specialties and the emergence of an acute shortage of specialists with digital competencies, the educational system faces new challenges. The need to adapt to the new requirements of the labor market, where specialists with programming skills, big data analysis, and digital project management are in demand, is becoming key. Reforming the educational infrastructure in these conditions requires a radical revision of approaches to learning. The need to create fundamentally new educational models focused on the development of digital competencies is becoming obvious and is recognized by many specialists [1, 5, 7].*

The use of digital technologies in educational activities is becoming a real practice around the world. Currently, an innovative educational environment is being created in which the use of digital technologies becomes a prerequisite, and many educational institutions are successfully using this. The provision of training centers with equipment is growing – interactive whiteboards, tablets, good computers, virtual reality glasses and much more are becoming widespread. At the same time, it is necessary to remember that digital technologies are no longer only a tool, but also a new environment for human existence. The digital educational environment provides fundamentally new opportunities - to move from classroom learning to learning anywhere and anytime; design an individual educational route, thereby satisfying the educational needs of the individual; turn students not only into active consumers of digital technologies, but also creators of new resources, etc.

In addition, digital technologies can provide access to the best educational materials from around the world, enable participation in international educational projects and exchange experiences with other students and teachers. It should also be noted that in the digital environment, the role of the teacher changes from a transmitter of knowledge to a facilitator of learning. Teachers must have digital competencies, be able to use technology to create an engaging and effective educational environment, and motivate students to learn independently and develop critical thinking. Equally important is that digital technologies help make education more accessible to everyone, regardless of place of residence, age or financial status. Digital education can be “a tool to overcome socio-economic inequalities by providing equal opportunities for learning and development. Investment in digital education is an investment in the development of human capital, which ultimately leads to increased productivity and economic growth,” points out in his study F. J. Handley [4, p. 99].

One more aspect of the problem should be pointed out. Expert forecasts, including studies within the framework of UNESCO, indicate that digitalization will affect up to 50% of all work processes by 2036 [8]. This will lead to a reduction in the workforce, as well as a reduction in the number of jobs that require routine skills. Therefore, adult learning is an important aspect of digitalization of education that requires special attention. There is a wide range of digital technologies that can be used in the educational process in the training and retraining of specialists:

- Learning management systems (LMS) - allow you to organize the educational process online, providing students with access to educational materials, assignments, tests, as well as the opportunity to communicate with the teacher and other students.*
- Video conferencing allows you to organize online lessons, lectures, seminars and other educational events in real time.*
- Mobile applications provide students with access to study materials, online courses, tests and other educational resources anytime and anywhere.*
- Artificial intelligence is used to personalize the educational process, analyze student data, and select individual training recommendations.*
- VR and AR technologies make it possible to create interactive learning environments in which students can explore virtual objects, conduct experiments and gain practical skills.*

In this situation, centers for advanced training and mass retraining of personnel, created based on digital technologies, become an integral part of solving the problem of providing the economy with specialists with the necessary competencies. They provide an opportunity to gain new knowledge and skills adapted to new labor market requirements. Among them, as indicated in the study by S. Dias-Trindade and A. Ferreira, the key ones are:

- *Digital literacy is the possession of basic knowledge and skills in working with information technology, including the use of digital tools, searching and processing information, and safe behavior in the Internet space.*

- *Critical thinking is the ability to analyze information, identify fake news, recognize manipulation, and form your own opinion.*

- *Creativity and innovative thinking – the ability to generate new ideas, find innovative solutions, and adapt to rapidly changing conditions.*

- *Teamwork – the ability to interact effectively in groups, solve problems together, share information and experience.*

- *Professional competence is the acquisition of highly specialized knowledge and skills in the chosen field, including in the field of information technology, digital design, software development [2, p. 165].*

Analysis of the use of digital technologies in the training and retraining of specialists made it possible to create a holistic model that integrates various aspects of this process. This model includes:

- 1. Advanced training and retraining of the workforce.*

- *Online courses and platforms. Digital platforms such as Coursera, Udemy, edX provide access to a wide range of courses, allowing workers to improve their skills and learn new skills that are in demand in the modern world.*

- *Gamification. Modern apps and games make learning more accessible, interactive and interesting, increasing motivation and learning efficiency.*

- *Virtual and augmented reality. Virtual and augmented reality open up new opportunities for hands-on learning by enabling simulations and realistic learning scenarios.*

- 2. Development of new industries and innovations:*

- *STEM Education. Digital technologies make it possible to effectively teach adults the basics of science, technology, engineering and mathematics, which is a key factor for the development of innovative industries.*

- *Creation of new professions. The development of digital technologies and artificial intelligence leads to the emergence of new professions that require specific knowledge and skills. Digital educational technologies are helping to train specialists for these new fields.*

- *Stimulating entrepreneurship. Online courses and resources provide access to knowledge and tools for creating startups, promoting entrepreneurial development.*

- 3. Improving management efficiency.*

- *Data analysis and forecasting. Digital technologies make it possible to collect, analyze and interpret large volumes of data, which helps make more effective management decisions.*

- *Process automation. Using artificial intelligence and machine learning allows you to automate routine tasks, freeing up time for more creative and productive work.*

- *Improved communication. Digital platforms and tools facilitate communication between various economic entities, increasing the speed and efficiency of information exchange.*

- 4. Creation of new business models.*

- *Online training. Digital educational technologies open up new business opportunities in the education sector. Online courses and platforms make it possible to provide educational services on a scale previously unavailable.*

- *Personalized learning. Digital technologies make it possible to create personalized training programs tailored to the needs of each individual, increasing the effectiveness of learning.*

- *Lifelong learning. Digital technologies provide access to lifelong learning, allowing people to continually improve their skills and adapt to changing labor market demands.*

- *Specialization and retraining. Retraining centers offer programs focused on specific professions in demand in the digital economy. For example, training specialists in working with artificial intelligence, data analytics, cybersecurity, mobile application development, and Internet marketing.*

- *Modular training. Flexible training programs that allow you to gain new knowledge and skills in individual modules are ideal for people who want to learn new competencies without having to take a break from work.*

It is important to note that this model not only expands opportunities for self-education, but also provides support in group interaction, which is critical for adult audiences. In addition, "the introduction of a holistic model of training and retraining of specialists, relying on digital educational technologies, creates opportunities for constant updating of content and the formation of a feedback system," points

out I. Robert [6]. This allows you to quickly respond to changes in the industry, introduce new knowledge and skills, which is important in a rapidly changing labor market. Ultimately, a holistic model for the use of digital technologies in education serves as the basis for increasing the competitiveness of specialists and their professional growth.

Let us note that the introduction of digital technologies in education should not be limited to simply replacing traditional teaching methods with digital ones. The key aspects of the successful integration of digital technologies into the educational process are:

- Selecting suitable digital tools – it is necessary to make an informed choice of technologies, taking into account the specific goals and objectives of the educational process, as well as the individual characteristics of students.
- Development of methodological recommendations - it is important to provide both students and teachers with methodological support that will help them effectively use new technologies.
- Training and support – Provide students and teachers with training on new digital tools, as well as the necessary technical support.
- Creation of digital infrastructure - it is necessary to provide access not only to the Internet, computers, but also to special software necessary for the implementation of digital education.

The practice of using digital educational technologies in the training and retraining of specialists can be examined using the example of the work of the Great Stone Industrial Park. The Great Stone Industrial Park [3], which is one of the most ambitious projects in Belarus, demonstrates how digital educational technologies can become a driver of economic development. "Great Stone" is not just a technological platform, but a global project that is designed to become the locomotive of the Belarusian economy, attracting investments and technologies from around the world. Located just 25 kilometers from Minsk, it offers a unique business environment, characterized by modern technologies, convenient infrastructure and environmental responsibility. The park provides companies with access to ready-made production, engineering, transport, customs and social-administrative infrastructure, which significantly reduces the time and resources required to start a business.

The Great Stone project is being implemented within the framework of interstate Chinese-Belarusian cooperation, which confirms its scale and strategic importance. It includes enterprises from various industries, from high-tech industries to light industry, which will be located in the park, creating new jobs and stimulating economic development. On the territory of the park it is planned to create not just a production site, but an entire city with developed infrastructure. Involving leading financial and scientific organizations will create an environment for innovative development and technological progress.

Realizing the intense competition for investors, Belarus has created attractive business conditions within the Great Stone. The special tax regime operating within the park offers residents significant tax benefits, making doing business more attractive. A unique approach to administrative work, allowing companies to receive the full range of services needed to run a business in one place. The Great Stone is an integrated approach to creating a new model for the development of the Belarusian economy. It is not only a site for production, but also a center for attracting investment, technology and skilled labor. Thanks to an innovative approach to management, developed infrastructure and attractive conditions for business, "Great Stone" has every chance to become one of the leading industrial centers not only in Belarus, but also in the entire region.

Digital transformation in the training and retraining of specialists for the Great Stone includes the use of the following tools:

1. Online learning platforms. The park actively uses online platforms to train resident employees. These platforms provide access to various courses, webinars and master classes on current topics related to industry, logistics, management, finance, etc. Thanks to this, "Great Stone" provides continuous professional development, improving the skills of personnel and readiness for new challenges.
2. Simulations and virtual reality. To develop skills in the field of production management, logistics, robotic systems, etc., "Great Stone" introduces simulators and virtual reality technologies. This allows you to significantly reduce training costs, increase its efficiency, and also reduce the risks associated with errors when mastering complex technologies.
3. Interactive trainings and online consultations. The park actively uses interactive trainings and online consultations to increase employee motivation and engagement. This approach allows not only to transfer knowledge, but also to consolidate it in practice, as well as receive feedback from experienced specialists.

4. "Smart" training programs. "Great Stone" develops "smart" educational programs that adapt to the individual needs and characteristics of students. Using artificial intelligence and machine learning, programs analyze the progress of each specialist and offer the most effective training methods.

The economic and social effects of introducing digital educational technologies into the practice of the industrial park include:

1. Improvement of personnel qualifications. Investments in digital education at the Great Stone lead to improved qualifications of personnel, which makes them more competitive in the labor market.

2. Stimulating innovation. Digital educational technologies contribute to the introduction of new ideas and approaches in various areas of the park's activities, which stimulates the innovative activities of residents.

3. Increased labor productivity. Thanks to digital technology-based training, Great Stone employees become more efficient, which leads to increased productivity and economic growth.

4. Strengthening the park's image. "Great Stone" positions itself as an innovation center, which attracts new investors and residents, contributing to the further economic development of the region.

To further implement the digital transformation of training and retraining of specialists, it is necessary to take a number of measures:

- Financing – allocate sufficient funds for the development of educational infrastructure, the creation of research centers, and support for retraining and advanced training programs.

- Methodological support – create conditions for the development of digital education, including the development of standards and educational programs.

- Creating an information environment – providing access to modern information resources, developing technological infrastructure, creating conditions for the free dissemination of knowledge and information.

Discussion. Digital transformation in modern society poses not a threat, but significant opportunities for the formation of a society based on knowledge, innovation and the disclosure of the potential of each individual. The process of digital transformation of education should be considered not only as a technical modernization, but also as a comprehensive reform related to all aspects of educational activities. To effectively implement this transformation, it is necessary to coordinate the efforts of all stakeholders, including government agencies, educational institutions, the business sector and public organizations. Such an intersectoral approach will ensure the integration of technologies into the educational process, as well as create conditions for sustainable development and an inclusive approach to education, which, in turn, will contribute to the formation of competent and ready-to-meet the challenges of the modern world of citizens.

Digital educational technologies open up new horizons for us in the management of socio-economic development. They can improve the skills of the workforce, develop new industries, ensure management efficiency, create new business models and reduce social inequality. The introduction of digital technologies in education is a complex and multifaceted process that requires an integrated approach. It is important not only to provide access to technologies, but also to create conditions for their effective use, guaranteeing the quality of education, safety and comfort of students.

The use of digital educational technologies in the Great Stone Industrial Park is an important step in the development of an innovative model of socio-economic development in Belarus. These technologies make it possible to create flexible educational trajectories adapted to the needs of business, as well as ensure the continuous development of skills, which is critically important in a rapidly changing world. As a result, investments in education, the development of digital technologies and the introduction of smart learning systems will not only improve the quality of the workforce, but also turn the Great Stone into an international centre of innovation and create prerequisites for long-term prosperity. Thus, this example illustrates the successful application of digital educational technologies in the field of socio-economic development management, opening up new prospects for the development of both individual enterprises and society as a whole.

References

1. Baskey S.K., Roy A., Ray D. Educational technology: vision 21st century [Electronic resource]. Available at: https://www.researchgate.net/publication/376451662_DIGITAL_TECHNOLOGY_IN_EDUCATION_FOR_THE_TEACHING_AND_LEARNING_PROCESS_OF_21ST_CENTURY (Accessed 08.08.2024).

2. Dias-Trindade S., Ferreira, A. *Digital teaching skills: DigCompEdu Check In as an evolution process from literacy to digital fluency* // *Revista De Comunicación y Tecnologías Emergentes*, 2020, No. 18(2), pp. 162-187.
3. Great Stone. *Official site* [Electronic resource]. Available at: <https://industrialpark.by/> (Accessed 08.08.2024).
4. Handley F. J. *Developing digital skills and literacies in UK higher education: Recent developments and a case study of the digital literacies framework at the University of Brighton, UK.* // *Publicacione*, 2018, No. 48(1), pp. 97-109.
5. Mirriahi N., Alonzo D., Fox B. *A blended learning framework for curriculum design and professional development* // *Research in Learning Technology*, 2015, No. 23, pp. 1-14. [DOI.org/10.3402/rlt.v23.28451](https://doi.org/10.3402/rlt.v23.28451)
6. Robert I. *Implementation of the Internet for Educational Purposes* [Electronic resource] // *Smart Education and E-Learning*. Available at: http://link.springer.com/chapter/10.1007/978-3-319-39690-3_51 (Accessed 08.08.2024).
7. Schmidt J. T, Tang, M. *Digitalization in Education: Challenges, Trends and Transformative Potential* // *In Führen und Managen in der digitalen Transformation*, 2020, No. 1, pp. 287-312.
8. *The Global Education Innovation Summit Report 2023 by UNESCO* [Electronic resource]. Available at: <https://www.unesco.org/gem-report/en> (Accessed 08.08.2024).

USING ENGLISH POP SONGS FOR STUDENTS` PROFESSIONAL AND PERSONAL DEVELOPMENT (1ST-2ND YEAR)

Kuanyshbek Aygerim Talgatqyzy

O.Zhanibekov SKPU, Shymkent, Kazakhstan

Abstract

English pop songs are valuable tools for the professional and personal development of 1st and 2nd year bachelor students. This paper examines their efficiency in developing linguistic, cultural and societal competence. By incorporating music into the learning process, students can enhance language skills, including pronunciation, listening comprehension and lexical acquisition. Moreover, pop songs promote individual development by building emotional intelligence, creativity and cultural proficiency. The study examines the practical application of English pop songs in language classrooms and assesses their role in making an enjoyable and inclusive learning environment. The outcomes demonstrate that the inclusion of music in educate bridges theoretical knowledge and its application in the actual world, promoting to the holistic improving students.

Key words: English language learning, cultural intelligence, emotional intelligence, pop culture, global communication, interactive learning, student motivation, modern teaching methods.

Introduction

In today's education, innovative teaching techniques are becoming more and more essential to fulfill the diverse needs of students. English pop songs are an exciting and effective instrument in language education, offering an enjoyable environment to enhance language proficiency while promoting cultural understanding and personal growth. This approach allows the music to utilize its universal appeal, creating a learning environment in which students are naturally self-motivated and emotionally engaged. Pop songs improve language skills such as pronunciation, listening comprehension, and vocabulary acquisition, frequently acquainting students with idiomatic expressions and cultural values that textbooks may miss. Moreover, the thematic concept of songs, which often address universal themes such as love, resilience, social fairness encourages empathy and critical thinking [1, p.4].

The objective of this article is to explore the multiple benefits of incorporating English pop songs into the classroom and to offer some practical strategies for their effective implementation. Through analyzing case studies and existing research, the article highlights the best practices for integrating music into lessons, such as creating text-based exercises, group performances and reflective discussions. Potential challenges, such as selecting age-appropriate material and accommodating different skills levels also addressed [2, p.20].

The significance of pop songs in foreign language studying

Vocabulary building

Pop songs are abundant in casual vocabulary, idiomatic phrases and slang, exposing learners to natural language usage. Unlike conventional workbooks, songs represents vocabulary in relevant contexts, encouraging memorization and practical application. For example, songs by artists such as Adele or Shawn Mendes always feature phrases that reflect real-life conversations, helping students comprehend nuances of meaning and usage.

Pronunciation and intonation

By singing along with English pop songs, learners can mimic the pronunciation and rhythm of their mother tongue. Research shows that music helps increase muscle memory by helping students reproduce accurate sounds and intonation. Tutors can design tasks in which students concentrate on certain sounds, such as -th in the word "with" or the -r in the word "heart", to improve their phonetic awareness.

Through listening to songs, students get familiar with a wide variety of accents, speech tempo, and emotional tones. By analyzing song lyrics, students strengthen their ability to grasp spoken English in a range of contexts. For instance, students can compare the classical ballads` formal tone with the conversational style of modern pop tracks.

Nurturing Emotional intelligence

Emotional intelligence includes self-awareness, empathy, and social skills-qualities necessary for personal and professional success. Music, as a powerful emotional medium, fosters these qualities in students.

Emotional expression

Pop songs often address universal human experiences such as love, loss, and ambition. These themes resonate with young people, encouraging them to express their own emotions and reflect on their experiences. Group discussions of song lyrics can provide a platform for students to express their thoughts and communicate with their peers

Empathy and cultural sensitivity

Through exposure to songs from coherent cultures, students can gain insight into the values, traditions and societal problems of English-speaking communities. This not only broadens their horizons, but also fosters respect for diversity.

Developing creativeness and motivation

The use of English pop songs can ignite students` creativity and increase the motivation to learn:

1.Creative activities

Students can produce their personal lyrics, performing karaoke or composing reflections inspired by the songs. Such activities build self-expression and engagement.

2.Increased motivation

Pop music is simple to understand and enjoy, which decreases the perceived difficulty of language learning. Introducing familiar makes lessons more dynamic and less intimidating

Implementation strategies

Successful usage of English pop songs in education requires careful planning and execution:

1.Song choice

Teachers should choose song with easy-to-understand lyrics and related themes. For younger students, age-appropriate and motivating music is significant [3, p.7].

2.Interactive exercises

Assignments, such as fill in the blanks, translation of the lyrics, and group discussions on the meaning of songs encourage active involvement.

3.Curriculum integration

Pop music can supplement existing lesson plans, such as grammar or cultural studies, ensuring that they are aligned with learning objectives.

Issues and solutions

1.Complex vocabulary

Several pop songs use complex or abstract vocabulary. To solve this problem, educators can:

-Give pre-teaching materials that explain difficult words or notions.

-Select simplified versions of the song lyrics to match students` knowledge level

2.Cultural sensitivity

Some topics of expression may be unknown or irrelevant to a particular audience. Teachers should closely examine the lyrics and choose songs with appropriate to students` cultural norms and values.

Practice application in the classroom

Interpreting and analyzing song lyrics:

Students will analyze topics, pitch, and figurative language in song lyrics to advance critical thinking and comprehension abilities.

Vocabulary and Grammar Exercises:

Teachers can create "fill-in-the-blank" exercises or vocabulary quizzes based on song lyrics, reinforcing language concepts.

Role-playing and storytelling:

Songs with narrative elements can inspire role-playing activities in which students act out or expand on the story.

Personal Reflections:

Students write essays or diary entries about how a song relates to their experiences or aspirations, which promotes self-awareness.

Multimedia Projects:

Have students create music videos, presentations, or playlists that correspond to specific themes, such as teamwork or perseverance.

Addressing potential problems

Language barriers:

Provide translations, glossaries, or simplified versions of song lyrics to make them easier to understand.

Content sensitivity:

Choose songs with universal or positive content to avoid cultural misunderstandings or inappropriate themes.

Student Involvement:

Allow students to suggest their favorite songs to ensure inclusivity and increase interest.

Assessment Difficulties:

Create rubrics to assess activities such as text analysis, presentations, or creative projects to ensure clear learning outcomes.

Real-life applications of song-based learning

a) In academic contexts

Songs can reinforce curriculum topics such as poetry or stories through creative parallels.

They allow a move away from traditional methods, making lessons more dynamic and inclusive.

b) In professional contexts

The communication skills developed through music can be directly applied in networking, interviewing and working together in teams.

The broad vocabulary and cultural awareness gained from listening to songs makes students more versatile in global workplaces.

c) Personal Growth

Songs promote self-expression by inspiring students to explore their interests and talents beyond academics. This integrated approach helps them become confident, well-rounded individuals

Word rearrangement

Fill in the blank challenges students to restore the correct word order, improving their grammatical comprehension and sequencing skills. English pop songs are more than just a form of entertainment-they are powerful resource for professional and personal development.

Conclusion

Overall, the integration of English-pop songs into the educational process represents a powerful and multifaced approach to the professional and personal development of 1st and 2nd year undergraduate students. With the use of songs students will go beyond entertainment. Songs serve as a dynamic tool for developing language skills, cultural understanding and emotional growth. Furthermore, their wide ranging subject content provides an understanding of universal values and language acquisition.

References

1. Salgado J.A. Songs for vocabulary acquisition in adult learning // Universidad Pública de Navarra. - 2017. – 38 p.
2. Guzman P.L. English teaching to reinforce the 4 skills and the components of the language at a low-intermediate level through songs // univ. Claudia alicia yañez cortéz. -2013. – 155p.
3. Kimber L. Child development and the English language classroom: Age as a factor in learning with songs and chats // Fukuoka university. – 2014. – 24p.

EFFECTIVENESS OF USING A COMPLEX ONLINE COURSE ON THE DISCIPLINE "PHYSIOLOGY OF HUMANS AND ANIMALS"

Kurmangaliyeva Ainur Zhasulankyzy

2nd year Master's degree student of Zhetysu University named after I. Zhansugurov

Oksikbayev Berikzhan Kylyshbekovich

Candidate of Biological Sciences of Zhetysu University named after I. Zhansugurov

Abstract

This article explores the effectiveness of complex online courses in teaching the discipline of "Physiology of Humans and Animals", focusing on how digital learning platforms can enhance student engagement, knowledge retention, and academic performance. The study reviews key features of online courses, including interactive multimedia content, virtual labs, modular structures, and real-time assessments, which collectively aim to make complex physiological concepts more accessible and engaging for students. It highlights several benefits of online learning, such as increased flexibility, improved access to learning materials, and enhanced student satisfaction, alongside the challenges posed by the lack of hands-on laboratory experiences.

The article also includes a case study from a university where an online physiology course showed positive outcomes, including improved exam scores and higher student engagement. Despite these benefits, the article notes that fully replicating practical skills through virtual simulations remains a limitation, suggesting that hybrid models incorporating both online and in-person learning could be an ideal solution. The article concludes that, while online courses provide valuable opportunities for flexible and interactive learning, combining digital tools with traditional methods can better equip students with both theoretical knowledge and practical experience in physiology.

Keywords: *online learning, physiology education, human physiology, animal physiology, interactive learning*

Introduction

*The discipline of **Physiology of Humans and Animals** is a cornerstone of life sciences education, fundamental to understanding the function of biological systems in both humans and other living organisms. Traditionally taught through lectures, laboratory work, and textbooks, this subject has experienced a shift towards incorporating online learning platforms. In recent years, complex online courses have emerged as a significant tool for teaching physiology, providing an innovative approach to content delivery, student engagement, and assessment. This article explores the effectiveness of using a complex online course for teaching **human and animal physiology**, evaluating its impact on student learning, engagement, and academic outcomes.*

The advent of online education has brought profound changes to traditional methods of teaching and learning. Online courses offer flexibility, accessibility, and a wide variety of learning materials, making them an appealing option for both students and educators. For complex subjects like physiology, which requires the integration of theoretical knowledge and practical skills, online platforms offer unique opportunities to present detailed content in interactive and accessible ways.

*In the context of **Physiology of Humans and Animals**, online courses can include multimedia resources such as **animated diagrams, interactive models, videos, virtual labs, and quizzes**. These tools can enhance student understanding of complex physiological processes, such as cellular functions, organ system regulation, and the interaction between species.*

Key Features of Complex Online Courses

*A **complex online course** in physiology typically incorporates several key features that differentiate it from traditional learning environments:*

*1. **Interactive Multimedia Content:** Online courses often include animations and simulations to demonstrate physiological processes in a dynamic, visual way. For example, animations showing how the heart pumps blood or how neurons transmit signals can make abstract concepts more concrete.*

*2. **Modular Structure:** These courses are often broken down into modules or units, allowing students to progress at their own pace. Each module may contain lectures, readings, assessments, and hands-on virtual labs that guide students through progressively more complex topics.*

3. **Virtual Laboratories:** Traditional physiology courses involve laboratory work, where students perform experiments to observe physiological phenomena. Online courses often use virtual labs to simulate experiments, giving students the ability to explore and learn about human and animal physiology through interactive platforms. These simulations can help students visualize and manipulate data, even without access to physical lab equipment.

4. **Assessment Tools:** Online platforms allow for immediate feedback on assessments, with interactive quizzes, multiple-choice questions, and written assignments that are graded automatically. This allows students to monitor their own progress in real-time, helping them identify areas of weakness.

5. **Discussion and Collaboration:** Many online courses incorporate forums or group discussions, encouraging collaborative learning and peer interaction. This helps students engage more deeply with course material, exchange ideas, and develop a community of learners.

Evaluating the Effectiveness of Online Physiology Courses

Several studies and educational reports have examined the effectiveness of online learning, particularly in science disciplines like physiology. The following aspects highlight key findings regarding the effectiveness of online physiology courses:

1. **Improved Access to Learning Materials:** One of the most significant advantages of online courses is the ability to access learning materials at any time. For students in remote locations or those with busy schedules, online courses offer the flexibility to learn at their own pace, reducing barriers to education. In the case of physiology, this means students can review lectures, revisit complex concepts, and engage with supplemental resources without time constraints.

2. **Increased Student Engagement:** Studies have shown that interactive elements such as quizzes, virtual labs, and multimedia resources significantly increase student engagement. For example, a study conducted on students learning human physiology found that those using online simulations for lab exercises were more likely to remain engaged and perform better in assessments than those relying on traditional methods alone.

3. **Knowledge Retention and Application:** The incorporation of interactive and visual learning methods has been linked to better retention of knowledge in complex subjects like physiology. A study published in the *Journal of Online Learning and Teaching* (2021) reported that students who used online courses for physiology showed better long-term retention of information compared to students who attended traditional lecture-based courses. Virtual dissections, for instance, enabled students to understand anatomical structures and physiological functions more deeply, allowing them to apply this knowledge in real-world contexts.

4. **Increased Performance in Assessments:** Several surveys of students enrolled in complex online physiology courses have demonstrated improved performance in quizzes and final exams. The immediate feedback provided by online assessments helps students identify gaps in their knowledge and correct misunderstandings before progressing to more advanced topics. Additionally, the ability to revisit course materials and assessments supports deeper learning.

5. **Challenges in Practical Skill Development:** Despite the benefits, the lack of physical interaction in online courses remains a challenge, particularly in disciplines like physiology, where hands-on laboratory experiences are essential. While virtual labs can simulate many physiological experiments, they cannot completely replicate the tactile and observational skills developed in a traditional laboratory setting. To address this, some online courses incorporate hybrid models, combining online content with occasional in-person lab sessions to ensure students gain practical, hands-on experience.

6. **Student Satisfaction and Perceived Learning:** Overall, students tend to report high levels of satisfaction with online physiology courses, citing the flexibility and accessibility as major advantages. However, some students express concerns about the lack of face-to-face interaction with instructors, which can make it harder to ask questions and receive personalized feedback.

Case Study: A Complex Online Course in "Physiology of Humans and Animals"

A recent case study conducted at a university using a **complex online course** for teaching **Physiology of Humans and Animals** revealed positive outcomes. Over a semester, students in the online course performed better on both theoretical exams and practical assignments compared to their peers in traditional classroom settings. Students particularly appreciated the use of **virtual dissections**, where they could explore the structure and function of various organs and systems at their own pace. Feedback from students indicated that the multimedia approach helped them grasp difficult concepts like neurophysiology and cardiovascular regulation more easily.

However, the course faced some challenges related to ensuring full engagement among all students, particularly those with limited experience in self-directed learning. In response, the instructors introduced regular **live webinars** and group discussions to enhance interaction and clarify complex topics.

Conclusion

The use of complex online courses in the discipline of **Physiology of Humans and Animals** has proven to be an effective method for improving access to learning materials, increasing student engagement, and enhancing knowledge retention. While virtual simulations and multimedia content help students visualize complex physiological processes, challenges remain in providing hands-on practical experiences. Nevertheless, the flexibility and interactive nature of online courses offer significant advantages, making them a valuable tool in the education of future scientists and health professionals.

To maximize the effectiveness of online physiology courses, it is essential to combine them with hybrid models that offer both online and in-person learning opportunities. By integrating innovative digital tools with traditional methods, educators can create a more comprehensive and engaging learning experience that prepares students for success in the field of physiology.

REFERENCES

1. Anderson, C. A., & Walther, P. (2019). The impact of interactive online learning tools on student engagement in human physiology courses. *Journal of Online Learning and Teaching*, 15(2), 135-146. <https://www.jolt.merlot.org/> (Note: replace with actual journal link if available)
2. Davies, S., & Jang, W. (2020). Integrating virtual labs into physiology education: A review of current practices and future directions. *Advances in Physiology Education*, 44(3), 297-307. <https://doi.org/10.1152/advan.00067.2020>
3. Garrison, D. R., & Anderson, T. (2016). *E-learning in the 21st century: A framework for research and practice* (3rd ed.). Routledge.
4. Haldeman, M. K., & Schmidt, M. A. (2018). Enhancing student learning in physiology through digital simulations. *Physiology Educator*, 26(1), 47-54. <https://www.physedjournal.com/>
5. Johnson, T. L., & Meeks, E. (2021). Student satisfaction and academic performance in online physiology courses. *Journal of Science Education and Technology*, 30(5), 629-641. <https://doi.org/10.1007/s10956-021-09960-2>
6. Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press.
7. Morin, E., & Jacobs, C. (2017). Virtual dissections and their role in anatomy and physiology education: A comparative study. *Anatomy & Physiology Education*, 45(4), 312-323. <https://doi.org/10.1016/j.ape.2017.07.004>

DEVELOPMENT OF INNOVATIVE THINKING SKILLS OF STUDENTS IN BIOLOGY LESSONS**Bektemir Mehri Abdimaulykyzy***1st year Master's degree student of Karaganda Buketov University***Myrzabayev Amanai Baityrumovich***Candidate of Pedagogical Sciences,**Professor of Zoology Department of Karaganda Buketov University***Abstract**

The issue of students' innovative thinking skills' development is the main topic of the study, which is based on pedagogical literature. Analysis and testing are done on the outcomes of students both before and after the application of test tasks influencing the development of creative thinking skills of students. The following characteristics of how these tasks affected the intellectual kids. In order to be prepared for the intellectual competitions in biology, it is found that complicated tasks have an impact on the growth of functional literacy. The style of inquiry was used with pupils between the ages of 14 and 16. The level of students was found to be impacted by tasks for the development of innovative thinking skills.

Keywords: *innovative thinking skills, biology, intellectual competitions, complexity level, research projects*

Introduction.

"Understanding, assessing, and using written materials and engaging with them to participate in society, attain one's goals, and develop one's knowledge and potential" is the definition of literacy [1]. Biology is a fundamental and applied science field that is rapidly growing. It is crucial to our understanding of life at all scales, from molecular biology to interactions on a global scale [2].

The ability to function in the social roles of a voter, consumer, family member, and student is determined by functional literacy. It enables you to put your abilities to use in setting up various adventures, creating connections with various social structures and organizations, etc [3]. PISA understands functional literacy in a broad sense as a set of knowledge and skills that ensure the successful social and economic development of the country; [4] in a narrow sense, as the key knowledge and skills necessary for a citizen to fully participate in the life of modern society [5]. A person's capacity to answer questions about the natural sciences, as well as their preparedness to have a keen interest in scientific concepts, developments, and innovations. PISA includes a set of specified competencies for science literacy. The ability of pupils to use the knowledge and abilities they have learned in school in real-world settings is referred to as competence [7]. In PISA, there are three main categories of tasks:

1. "How do you know?" tasks that require the use of ways of knowledge.

2. Assignments to "try to explain" events and facts

3. "Make a conclusion" assignments help students develop the ability to draw conclusions based on data. People who are biologically literate should comprehend the fundamental ideas in biology. Students that are biologically literate should understand the variety of species and how they are categorized. The fundamental ideas of biology should be understood by all citizens. Memory, analysis, comprehension, learning, and reasoning are only a few examples of cognitive skills. "Developing functional literacy toolkits for middle and high school students in biology" is intended to: promote the development of a range of skills and abilities that are at the core of functional competence. The developed set of tasks is a tool for developing specific skills, which together constitute biology as a subject and the essence of functional abilities. Possession of these abilities and skills serves as an indicator of base in students while preparing for biology intellectual competitions.

Applied in biology innovative methods and techniques.

These biology tasks include 25 complex tasks based on the example of PISA tasks. The questions are created in accordance with basic biological principles. The focus of the tasks on the organization of functional literacy includes topics on botany, zoology, genetics, physiology, ecology, immunology, microbiology and general biology.

Task № 1.

The picture shows a spider and a pin standing in water.



The reason spiders float in water is the presence of hairs that cause the spider to be weightless. Because the pin is lightweight floats in water

Question 1: What do a spider floating in water and an iron pin have in common?



Answer 1.1:

1. Pedipals
2. Fangs
3. Chelicerae
4. Eyes
5. Legs
6. Spinnerets
7. Abdomen
8. Pedicel
9. Cephalothorax

Task 2: Identify the structure of the spider in the picture.

Task 3. State whether each of the following concepts is a TRUE or FALSE:

A student found two different leaves of different plants. He took it with him and then noticed that it had started to rot. They are shown in picture A and B.

**A****B**

Answer: A – Dicotyledonous (leaf) B – Monocotyledonous (leaf)

Task 4. Identify to which two main groups the leaves shown in the picture belong.

Task 5. The process of putrefaction is most often caused by bacteria. Name one other organism that can prevent decay.

Task 6. Leaf rotting improves the composition of the soil and creates conditions for good plant growth. Explain how the process of rotting returns nitrogen to the soil.



Task 7: Humans are thought to be descended from animals such as gorillas, as shown in Figure A. Humans walk on two legs. What is this movement called?

Task 8: Describe two ways in which the skeleton in picture B adapted to this type of movement.

Task 9: Mention one advantage of Homo sapiens associated with vertical walking

Table 1

Stages of preparing for the innovative research competitions

<i>Research and design</i>	<i>The "mature" project reflects the personal and individual position of the author and has a social and practical significance. With such projects, our students became the winners of the regional</i>
<i>Solving problems, performing tests</i>	<i>The student has the opportunity to gradually perform simple tasks first, and then a higher level of complexity.</i>
<i>Carrying out practical work</i>	<i>The requirements for the practical tour are increasing every year, because it is here that the student can apply his knowledge in practice.</i>
<i>The principle of knowledge activity</i>	<i>Olympiad tasks are compiled in such a way that the entire stock of knowledge is in active use. They are compiled taking into account all previous knowledge, in accordance with the requirements of the standard of education and the knowledge gained at the moment</i>

[a table is compiled by authors]

The goals may be different, as a rule, it is a generalization, systematization of the material, or, conversely, a leading question before studying a new topic. In search of the necessary information, a variety of sources are "shoveled", the necessary skills are acquired, and the products created at the same time are then used as reference materials. Much attention is paid to working with educational and reference literature on ecology, because this subject is not studied in our school, and schoolchildren show great interest in it.

Currently, along with books, perhaps an important role is played by such a source of information as the Internet. Electronic versions of books, journal articles, various tests, tasks of Olympiads of various levels can also be found on various biological sites. Is it possible and necessary to manage this flow of information? In any case, it is advisable to familiarize students with a list of biological sites where they

can find useful information for themselves. One of these sites is undoubtedly www.kpdbio.ru, where resources are placed to prepare for the regional stage in biology. On this site, you can get online advice on a question of interest, test your knowledge by performing test tasks of previous years, watch a video tutorial.

Conclusion

The fundamental ideas of biology should be understood by all citizens. Memory, analysis, comprehension, learning, and reasoning are only a few examples of cognitive skills. "Developing functional literacy toolkits for middle and high school students in biology" is intended to: promote the development of a range of skills and abilities that are at the core of functional competence.

The scientific novelty of this work was that testing tasks should correspond to different levels of biology mastery, which contributes to student development while taking into account unique student characteristics in preparation for PISA, various Olympiads, etc. The development of knowledge, in our case the development of FG students, is most effective when carried out methodically, with a variety of types and forms.

References

1. Post, A., Semilarski, H., & Laius, A. Assessing the biological literacy cognitive components of 10th and 11th grade students. *Estonian Journal of Education* 5(1), Estonia. -2017. -P. 206–238.
2. PISA 2015 Results. Excellence and Equity in Education. Volume 1. URL: <https://www.oecd-ilibrary.org/>
3. PISA 2016 Results. Excellence and Equity in Education. Volume 1. URL: <https://www.oecd-ilibrary.org/>
6. Uttamchandani S. Educational intimacy: Learning, prefiguration, and relationships in an LGBTQ youth group's advocacy effort. *Journal of the Learning Sciences*, 30(1). -2021. -P. 52-75.
4. Harris E.M., Dixon C.G.H., Bird E.B., Ballard H.L., For Science and Self: Youth Interactions with Data in Community and Citizen Science, *Journal of the Learning Sciences*, 29(2). -2020. -P. 224-263.
5. F., Pachman M., Dai Z., Investigating educational affordances of virtual reality for simulation-based teaching training with graduate teaching assistants, *Journal of Computing in Higher Education*, 32(3). -2020. -P. 607-627.
6. Schumacher C., Ifenthaler D., The importance of students' motivational dispositions for designing learning analytics, *Journal of Computing in Higher Education*, 30(3). -2020. -P. 599-619.
7. Fischer J., Jansen T., Moller J., Harms U. Measuring biology trainee teachers' professional knowledge about evolution—introducing the Student Inventory, *Evolution: Education and Outreach*, 14(1). -2021. -P. 93-107.

DIFFERENT APPROACHES TO LEARNING ENGLISH IN DIVERSE CLASSROOM IN SECONDARY SCHOOL

Irina Yurievna Savostianova

Master student, group 1703-84

Marina Yurievna Shingaryova

*Candidate of pedagogical sciences, associate professor,
South Kazakhstan Pedagogical University, Shymkent, Kazakhstan*

РАЗЛИЧНЫЕ ПОДХОДЫ К ИЗУЧЕНИЮ АНГЛИЙСКОГО ЯЗЫКА В РАЗНОРОДНЫХ КЛАССАХ СРЕДНЕЙ ШКОЛЫ

Савостьянова Ирина Юрьевна

магистрант группы 1703-84

Шингарева Марина Юрьевна

*к.п.н., доцент,
Южно-казахстанский государственный педагогический университет,
Шымкент, Казахстан*

Abstract

In today's globalized world, diverse classrooms are becoming increasingly common, requiring educators to adopt varied approach to teaching English as a foreign language. This article presents the ideas of different researchers that laid the foundation for and contributed to the further development of differentiated learning. The article highlights the role of differentiated instructions and the integration technology in creating inclusive learning environments. It emphasizes the importance of tailoring instruction to accommodate students' varying levels, learning styles and cultural contexts.

Keywords: *diverse classroom, differentiated instruction, engaging task, differentiated learning*

Every day, every lesson, every teacher, entering the class meets children with different levels of knowledge, learning abilities, perceptions of learning material, motivation, because each child is unique. Despite this, the teacher must interest each pupil, involve everyone in learning process, help to master the curriculum. So, teachers have to teach differently to different students.

The idea of tailoring education to individual learner dates back to ancient times. Philosophers such as Socrates emphasized questioning and dialogue tailored to learner's understanding, laying the groundwork for personalized approaches. Similarly, Quintilian, a Roman educator, advocated for teaching methods that considered students' unique needs and abilities. Later, Jean-Jacques Rousseau proposed that education should be adapted to the natural development and interests of the child. His ideas challenged the rigid, one-size-fits-all approach of traditional schooling and inspired later progressive educational movements. But the pioneer of differentiated learning is the American philosopher and educator John Dewey, who emphasized the importance of experiential learning and adapting education to students' interests and experiences. His progressive education movement advocated for student-centered instruction, which align closely with modern differentiated practices.

Moreover, Vygotsky's sociocultural theory introduced the concept of the Zone of Proximal Development, which highlights the importance of providing instructions that is just beyond a student's current level of competence. His ideas on scaffolding and social interaction in learning strongly influences differentiated instruction, encouraging teachers to meet students at their level and gradually build their skills.

As a theoretical background of differential teaching, we'll mention the theory of multiple intelligences, the socio-cultural theory of learning, and the theory of the brain (Brain-Based learning). The theory of multiple intelligences (Gardner, 1983) goes hand in hand with differentiated teaching as the "child-centered" approach proposes various learning paths based on the characteristics of each intelligence such as linguistic, logical-mathematical, musical, spatial, and interpersonal.

With the rise of inclusive education and recognition of diverse classroom, differentiated learning gained prominence in modern pedagogical frameworks. The Universal Design for Learning (UDL), developed in the late 20th century, and constructivists teaching models emphasize creating flexible learning environments that accommodate all students.

This problem has been researched by many scientists and teachers for many years. One of the way to solve this issue is division of the class into several groups depending on the students' learning abilities. This division is carried out at different stages of the lesson and types of speech activities. Pupils of almost every class can be divided into three groups: with high (students can show high results, they have developed all types of speech activities, have a special interest in learning foreign language), average (students learn only material provided in class), and relatively low levels of abilities ("weak students", who due to their abilities, desires, family circumstances, cannot learn the material or simply learn the bare minimum). In accordance with this, the nature and number of the tasks performed at various stages of the lesson for each group are determined.

"One of the big problems teachers face is classes where students are at different levels- some with quite competent English, some whose English isn't very good, and some whose English is only just started. Even if things are not so extreme, teachers of English – along with teachers of other subjects-regularly face mixed-ability groups where different individuals are at different levels and have different abilities". (Jeremy Harmer, 2010).

Jeremy Harmer offered to form different groups, in other words, treating some students differently from others. (Jeremy Harmer, 2010). As he mentioned, "teachers can encourage students to do different tasks depending on their abilities, for instance, a reading text can have sets of questions at three different levels: the better ones will quickly finish the first two sets and have to work hard on the third. The weakest students may not get past the first set". In speaking and listening, the better students will understand more completely and more quickly. However, the danger of this position is that students may either be bored by slowness of their colleagues or frustrated by their inability to keep up". Some teachers organize the work in pairs or groups in order the better students can help the weaker ones. However, this has been done with great sensitivity so that students don't feel alienated by their over-knowledgeable peers or oppressed by their obligatory teaching role." (Jeremy Harmer, 2010).

Differentiated learning refers to the outcomes or experiences of students when their learning is tailored to meet their individual needs, preferences, abilities, or interests. It emphasizes the result of instructional approaches that accommodate diverse learning styles. Mostly it focuses on how students learn in the ways that suit their unique pace and capabilities. This process is student-driven, it emphasizes personalized learning pathways, it involves the integration of adaptive technologies and self-paced learning strategies, for example a student with a strong preference for visual learning might use video and infographics to master a concept, while another might prefer hands-on experiments.

The term "differentiation" as we know it today gained traction in the late 20th century. Carrol Ann Tomilson, a leading expert, the author of the book "The differentiated Classroom: Responding to the needs of all learners", provides practical framework for teachers to differentiate content, process, product, and learning environment. A researcher describes differentiation in teaching as how teachers consider students' needs while planning and delivering instruction.

Differentiated instruction is a teaching strategy that involves planning and delivering lessons in ways that address the varying needs, readiness levels, and interests of students in a diverse classroom, it is teacher-driven, as he designs and delivers the instructions, also the teacher is proactive in adjusting content, process, product, and learning environment to accommodate different learners.

The issue of differentiated instruction has been searching for many years by the scientists and practitioners. They consider that differentiated instructions involves teaching in a way that meets the different needs and interests of students using varied course content, activities, and assessment.

Differentiated instruction distinctively emphasis instructional methods to promote learning for children entering the course with readiness for, interest in, and ways of engaging with course learning based on the prior learning experiences. Successful implementation of differentiated instruction requires ongoing training, assessment, and monitoring (van Geel et al 2019) and has been shown to be effective in meeting students' different needs, readiness level, and interests. (Tuner et al. 2017).

Diane Heacox, an associate Professor, gives the definition to the differentiated instruction as

"changing the pace, level, or kind the instruction a teacher provide in response to individual learners' needs, styles, or interests ". (Diane Heacox, 2002) She confirmed that " differentiated instructions specifically responds to students' progress on the learning continuum- what they already know and what they need to learn". So, firstly, differentiated instructions are flexible and varied as

teachers use a lot of various strategies. Secondly, they are relevant, and focus on essential learning. Thirdly, they are rigorous, and teachers provide them in order to motivate students to push themselves, and teachers set goals for learning based on a students' particular capabilities.

Moreover, differentiated instruction must be complex as teachers challenge students' thinking and actively engage them in content that conveys depth and breadth. As we see, the role of teacher who differentiates instructions is very important, the teacher becomes both a facilitator and a collaborator. As a facilitator, the teacher organizes students for learning, provides and prescribes differentiated learning opportunities, and uses the time flexibly. As a collaborator, the teacher should form a partnership with other staff members and share materials, insights, and resources, another groups of collaborators includes students' parents as they'll help to know about students' interests and learning preferences. In any case, good teachers provide students with extra help, more time, or a modified assignment, whether they realize it or not, differentiate to some degree.

Differentiated learning draws from a rich history of educational thought, blending insights from philosophers, psychologists, and educators. Its origins lie in the timeless recognition of individual differences among learners, and its evolution continues as educators strive to create inclusive, engaging, and effective learning environments. As classrooms grow more diverse, and technology advances, differentiated learning remains a vital and dynamic approach to education.

References

1. Gardener Howard (2008) "Multiple Intelligences. New Horizons in Theory and Practice", Basic Books, New York, USA.
2. Harmer Jeremy (2010) "How to teach English..", Pearson Education Limited, Essex, UK.
3. Heacox Ed.D. Diane (2002) "Differentiating instructions in the regular classroom", Free spirit publishing, Minneapolis, Minnesota.
4. Tomilson Carrol Ann (2014), "The differentiated Classroom: Responding to the needs of all learners", ASCD, Alexandria, VA, USA.
5. Vygotsky, L. (1986). *Thought and language* (Kozulin, Ed. Trans). Cambridge, MA: The MIT Press.

THE OPTIMAL AGE FOR PRE-SCHOOL CHILDREN TO LEARN ENGLISH

Luiza Gozhamyarova
Deniza Tashtanova
Guzel Ruzahunova

Introduction

In today's globalized world, English has become a crucial language for communication, education, and career development. Its significance in international business, media, science, and technology underscores the importance of early language learning. Consequently, many parents and educators aim to introduce English to children at a young age, hoping to foster bilingualism and cognitive development. However, the "optimal age" for children to begin structured English

learning remains a topic of significant debate among linguists, psychologists, and education professionals.

Research suggests that while early childhood is a sensitive period for language acquisition, structured instruction may not be most effective during the earliest years. The "Critical Period Hypothesis", as explored by Lenneberg (1967), indicates that children under the age of seven exhibit exceptional neuroplasticity. However, evidence suggests that six-year-olds demonstrate emerging readiness, while age seven allows for more structured and focused learning due to enhanced cognitive, emotional, and social maturity.

Kuhl's (2010) "Neuroplasticity and Phonetic Learning Model" highlights the unique capacity of young children to perceive and replicate native-like pronunciation. Kuhl emphasizes that while early exposure to multiple languages, including English, provides foundational benefits, structured language instruction becomes more effective as children's cognitive and social skills mature, typically around ages six to seven.

Krashen's (1982) "Input Hypothesis" aligns with these findings, proposing that meaningful and comprehensible input—rather than age—is the key factor in successful language acquisition. His research implies that as children grow older, the quality of language exposure and instruction becomes increasingly significant, making ages six to seven particularly suited for structured learning.

The "Socio-Cultural Theory" (Vygotsky, 1978) emphasizes the role of social interaction in language learning. Vygotsky suggests that children acquire language most effectively when they are actively engaged in social contexts, where language is used meaningfully and contextually. This theory underscores the importance of interaction for children around ages six to seven, where they are more capable of learning through social and collaborative environments.

Finally, "The Interactionist Approach" (Bruner, 1983) suggests that language learning is driven by interaction with more experienced speakers, and that children's cognitive development supports this process around the age of seven, when they begin to better understand social cues and use language purposefully in real-life contexts.

By integrating these theories with experimental data, this article argues that while age six marks the beginning of readiness for structured English learning, age seven represents the optimal point for achieving better outcomes. This conclusion offers valuable guidance for educators, parents, and policymakers in designing effective early language education programs.

Methods and Materials

To determine the optimal age for children to begin learning English, this study investigates the effects of age on language acquisition, cognitive development, and student engagement through a mixed-methods approach that includes both quantitative assessments and qualitative observations.

We conducted a two-week study in a kindergarten "Union Preschool" in Almaty city, English class, to determine how well children of different ages understood new material. During the first week, the theme of the lessons was 'Sport'. Children were asked to learn words related to this theme including: football, basketball, volleyball, run, jump, swim, bike, tennis, goal, team, and win. The teaching materials were used colorful cards with pictures of sports, educational videos (e.g. cartoons of characters playing football or swimming), interactive games and songs in English.

· 1st week. Theme "Sport"

5 years old

- Child 1: His attention was mainly focused on the games and songs. For example, during the video-song "Sports song for kids", he was eagerly singing along, which helped him to memorise the words.

However, the child was often distracted by extraneous activities and could only listen attentively when using brightly coloured cards or participating in moving games (e.g. Run and Touch the Word). The maximum duration of concentration was 20-23 minutes.

- Child 2: She participated willingly in the lessons and understood the information better when cards and simple tasks were used. During the interactive game 'Find the Sport', she was interested in finding pictures and naming them. However, after 20 minutes, she began to tire, although she remained diligent if the topic was presented through a game or song.

To study the topic of Sport in an English lesson for 5-year-old children, we used the following cards, which you can see in Figure 1.

Figure 1. Cards on the topic of "Sport" for children 5 years old



Song "Sports Song for Kids: Play with me!" was used in the lessons:
(<https://youtu.be/ehyfGNH46Q4?feature=shared>)

Excerpt from the song:

Play with me!

Won't you play with me?

You can play with me

We can play together

6 years old

- Child 3: Was also able to learn the phrase 'I ride a bike'. The child enjoyed working with the cards, especially if they had dynamic scenes, such as children playing football. Videos about short also helped significantly with memorisation. Concentration was maintained for 25-30 minutes, especially if the tasks alternated between active and quiet.

- Child 4: He quickly learnt the phrase 'I love football' and even tried to say 'Our team wins!' on his own. The best results were shown when using cards and active tasks, for example, acting out mini-scenes where he named what he was doing (e.g. I run, I jump). Lessons lasted 25-30 minutes and the child stayed focused.

To study the topic of Sport in an English lesson for 6-year-old children, we used the following cards, which you can see in Figure 2.

Figure 2. Cards on the topic of "Sport" for children 6 years old



Song "Sports Song Educational" was used in the lessons:
(<https://youtu.be/27f0QUUScQ8?feature=shared>)

Excerpt from the song:*What do you like?**What do you like?**Baseball baseball**I like baseball**Basketball basketball**I like basketball***7 years old**

- Child 5: She could easily form short sentences such as 'I play volleyball every day' and 'I like basketball'. Due to her well-developed native language, the child kept a neat notebook, transcribing words and sentences. During the lesson she was actively involved in the discussion, answering questions such as: What is your favourite sport? Concentration was maintained for the whole 30 minutes.

- Child 6: With prompts he made sentences such as 'I like football' and 'I ride my bike every day'. He actively worked with cards during lessons and liked the tasks where he had to connect a word and a picture. We played active games such as "Catch the Ball", "Crocodile" and so on. Games help to learn words better. The lesson lasted 30 minutes, and the child remained diligent.

To study the topic of Sport in an English lesson for 7-year-old children, we used the following cards, which you can see in Figure 3.

Figure 3. Cards on the topic of "Sport" for children 7 years old



Image 1: Illustration of a lesson using a game



Image 2: Illustration from lesson

· 2nd week. Theme: "School things"

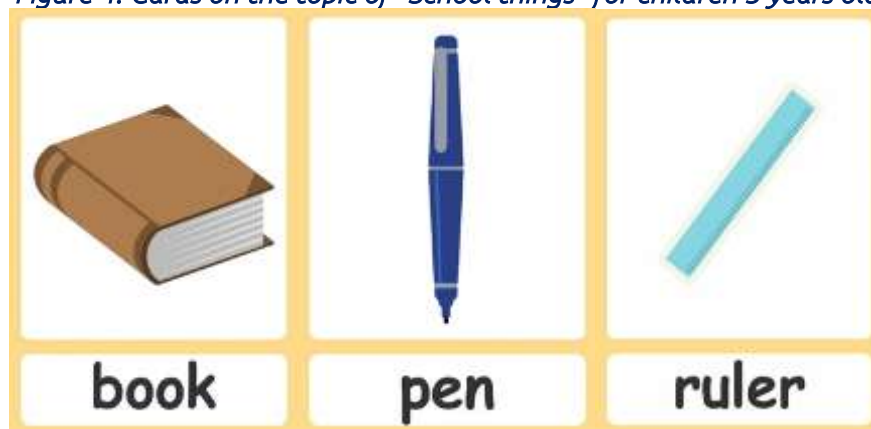
5 Years Old

- Child 1: He was particularly engaged during the video-song "School Supplies Song for Kids", where he enthusiastically repeated words, which aided in memorization. However, his attention was scattered at times, and he only stayed focused during moving games such as "Run and Touch the Word" or when using colorful flashcards of school supplies. The maximum concentration span was 20-23 minutes.

- Child 2: She enjoyed identifying objects through simple activities and cards. During the interactive game "Find the School Supply", she eagerly participated and named the items correctly. While her interest started waning after 20 minutes, she stayed engaged if tasks involved songs or games.

To study the topic of "School Things" in an English lesson for 5-year-old children, we used the following cards, which you can see in Figure 4.

Figure 4. Cards on the topic of "School things" for children 5 years old



Video "What's this? – School supplies" was used in the lessons:
(<https://youtu.be/1liwGMndb9Y?si=0St6UxWD3TI0m9mt>)

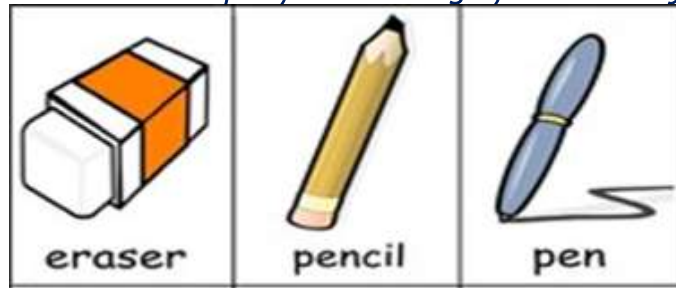
6 Years Old

-Child 3: She also retained the sentence, "I have a notebook". She enjoyed using cards depicting students interacting in a classroom. Videos demonstrating school activities enhanced her ability to associate visuals with words. She stayed focused for 25-30 minutes when tasks alternated between dynamic and calm.

-Child 4: He quickly learned the phrase "I write on the board" and attempted "My teacher writes on the board" with minimal prompting. Active participation was evident during games like "Act It Out" where he used simple sentences to describe actions. The lesson length was 25-30 minutes, and he remained engaged.

To study the topic of "School Things" in an English lesson for 6-year-old children, we used the following cards, which you can see in Figure 5.

Figure 5. Cards on the topic of "School things" for children 6 years old



Video "What's this? – School supplies" was used in the lessons:
(<https://youtu.be/hjFaqDNUVFo?si=jeTSqyhDqZG2B4Zk>)

7 Years Old

- Child 5: She effortlessly created sentences such as, "I go to school every day" and "My teacher is kind." Her ability to write in her native language helped her maintain organized notes. She participated actively during discussions about school activities and answered questions like, "What do you do in class?" She concentrated fully for the 30-minute lesson.

- Child 6: With some help, he made sentences such as, "I like my class" and "I write with a pen." He was enthusiastic during matching games and connected words with pictures efficiently. Active games like "Catch the Word" and "Guess the Object" significantly boosted his retention. The lesson lasted 30 minutes, and he remained focused throughout.

To study the topic of "School Things" in an English lesson for 6-year-old children, we used the following cards, which you can see in Figure 6.

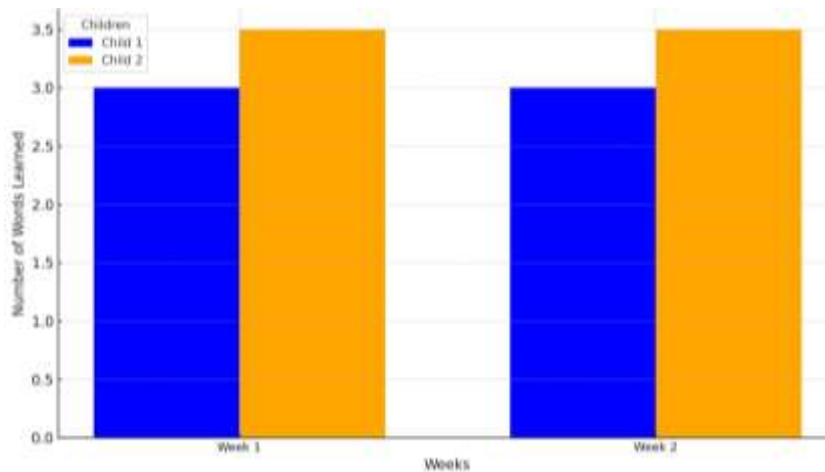
Figure 6. Cards on the topic of "School things" for children 7 years old



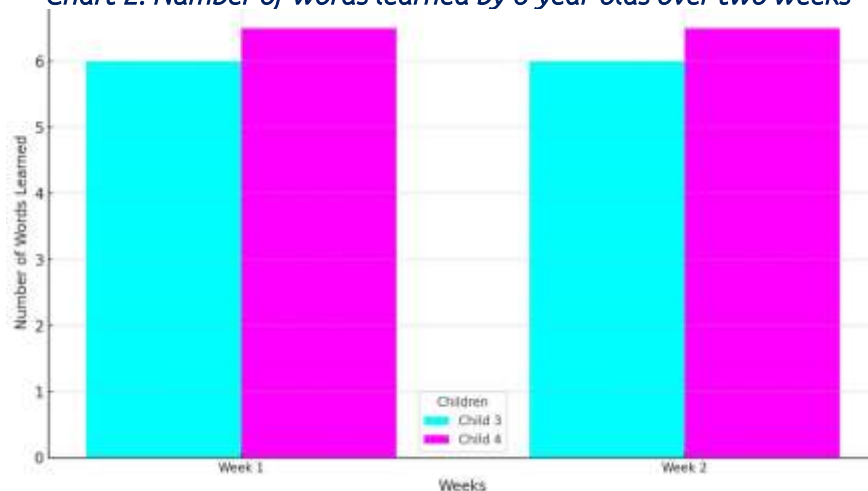
Video "My School | Going to School | Children's Song" was used in the lessons:
(<https://youtu.be/7i211NeJZRQ?si=-H-dAQjYJFMZprLL>)

Results

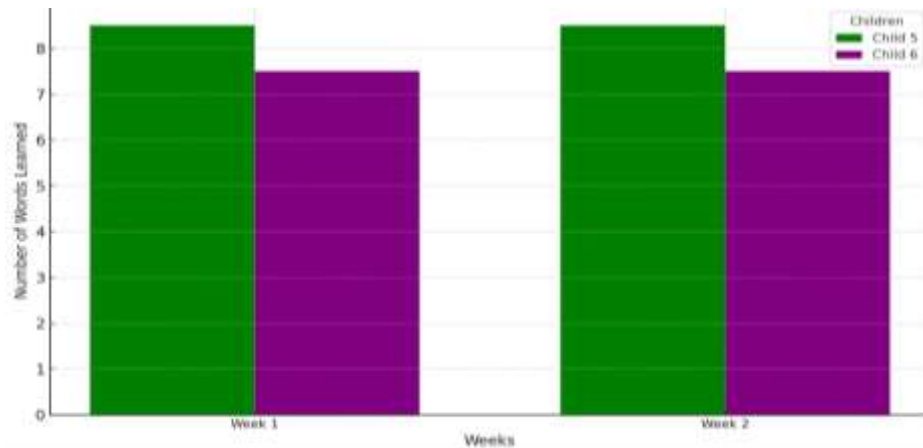
The study aimed to assess the effects of age on language acquisition and engagement during English lessons on the themes of "Sports" and "School." The results indicate that children in the 5–7 age group demonstrated varying levels of vocabulary acquisition, focus duration, and engagement, which correlated with both age and the learning methods used.

Chart 1. Number of words learned by 5-year-olds over two weeks

Note. The chart illustrates the number of words learned by two five-year-old children (Child 1 and Child 2) over two weeks. The x-axis represents the weeks, and the y-axis shows the number of words learned. **Week 1:** Child 1 learned 3 words (jump, run, ball). Child 2 memorized 3-4 words (swim, bike, team, run). Both children performed similarly, with the chart showing bar heights around 3-3.5. **Week 2:** Child 1 learned another 3 words (book, pencil, desk). Child 2 memorized 3-4 words (bag, pen, chair, ruler). Again, the progress was similar, with bar heights remaining around 3-3.5. Both children showed consistent learning rates over two weeks. While Child 2 demonstrated some variability (3-4 words per week), Child 1 learned exactly 3 words each week. The chart visually highlights the steady progress of both children.

Chart 2. Number of words learned by 6-year-olds over two weeks

Note. The chart illustrates the number of words learned by two six-year-old children (Child 3 and Child 4) over two weeks. The x-axis represents the weeks, and the y-axis shows the number of words learned. **Week 1:** Child 3 learned 6 words (football, basketball, bike, run, jump, goal). Child 4 memorized 6-7 words (basketball, team, win, run, jump, bike, goal). Both children performed similarly, with the chart showing bar heights around 6-7. **Week 2:** Child 3 learned 6 words (notebook, eraser, pencil, bag, board, teacher). Child 4 memorized 6-7 words (chalk, board, class, ruler, desk, bag, pencil). Again, the progress of both children was comparable, as the bar heights remain consistent at 6-7. Both children showed a high and steady rate of learning over two weeks, consistently acquiring 6-7 words each week. While Child 4 had slight variability in the number of words memorized, Child 3 learned exactly 6 words per week. The chart effectively highlights the parallel progress of the two children.

Chart 3. Number of words learned by 6-year-olds over two weeks

Note. The chart shows the number of words learned by two seven-year-old children (Child 5 and Child 6) over two weeks. The x-axis represents the weeks, and the y-axis indicates the number of words learned. **Week 1:** Child 5 learned 8-9 words (dance, basketball, football, run, bike, jump, swim, goal, tennis). Child 6 memorized 7-8 words (team, win, basketball, goal, jump, run, bike, tennis). The chart shows that Child 5 slightly outperformed Child 6, with bar heights indicating 8-9 and 7-8 words, respectively. **Week 2:** Child 5 learned 8-9 words (school, teacher, student, desk, bag, book, notebook, ruler, pencil). Child 6 memorized 7-8 words (board, bag, pen, student, chair, book, teacher, class). Child 5 continued to learn slightly more words than Child 6, maintaining a consistent pattern. Child 5 consistently learned 8-9 words per week, while Child 6 memorized 7-8 words per week. The chart highlights the steady learning progress of both children, with a slight difference in the number of words learned each week.

*Table 1.**1st week. Analysis of the topic of sports*

Age	Child	Materials	Words Learned	Achievements
5	1	Interactive methods, such as games, songs, and flashcards	jump, run, ball	3
	2	Interactive methods, such as games, songs, and flashcards	jump, run, ball, health	4
6	1	combination of dynamic visuals (e.g., flashcards with action scenes) and videos	football, basketball, bike, run, jump, goal	6
	2	combination of dynamic visuals (e.g., flashcards with action scenes) and videos	football, basketball, bike, run, jump, goal, skate	7
7	1	mix of sentence formation activities, games, and active participation in role-playing tasks	dance, basketball, football, run, bike, jump, swim, goal, tennis	9
	2	mix of sentence formation activities, games, and active participation in role-playing tasks	dance, basketball, football, run, bike, swim, goal, tennis	8

The study aimed to assess the effects of age on language acquisition and engagement during English lessons on the themes of "Sports" and "School things." The results indicate that children in the 5–7 age group demonstrated varying levels of vocabulary acquisition, focus duration, and engagement, which correlated with both age and the learning methods used.

Table 2.

2nd week. Analysis of the topic of school things

Age	Child	Materials	Words Learned	Achievements
5	1	Interactive methods, such as games, songs, and flashcards	book, pencil, desk	3
	2	Interactive methods, such as games, songs, and flashcards	bag, pen, chair, ruler	4
6	1	combination of dynamic visuals (e.g., flashcards with action scenes) and videos	notebook, eraser, pencil, bag, board, teacher	6
	2	combination of dynamic visuals (e.g., flashcards with action scenes) and videos	notebook, eraser, pencil, bag, board, teacher, laptop	7
7	1	mix of sentence formation activities, games, and active participation in role-playing tasks	school, teacher, student, desk, bag, book, notebook, ruler, pencil	9
	2	mix of sentence formation activities, games, and active participation in role-playing tasks	school, teacher, student, desk, bag, book, notebook, pencil	8

Vocabulary Acquisition:

5-Year-Olds: Children in this age group learned between 3 and 4 words during the lessons, with a preference for interactive games and songs. They displayed limited focus, with a maximum concentration span of 20-23 minutes.

6-Year-Olds: These children learned 6 to 7 words, showing better retention when dynamic flashcards and videos were used. Their attention span extended to 25-30 minutes, especially when tasks alternated between active and calm activities.

7-Year-Olds: At this age, children learned 8 to 9 words. Their ability to form short sentences and their consistent engagement during the 30-minute lessons indicate a higher readiness for structured learning.

Focus Duration:

Children in the 5-year-old group exhibited a shorter focus duration (20-23 minutes), primarily engaging with visual aids and active games.

The 6-year-olds demonstrated a slightly longer focus duration (25-30 minutes), benefiting from varied tasks that balanced active and quieter activities.

The 7-year-olds maintained their focus throughout the entire 30-minute lesson, participating actively in discussions and games.

Engagement and Learning Methods:

Interactive methods, such as games, songs, and flashcards, were particularly effective for 5-year-olds. These children preferred hands-on activities and showed the highest engagement when tasks involved movement or music.

For 6-year-olds, the combination of dynamic visuals (e.g., flashcards with action scenes) and videos led to better vocabulary retention and engagement. Active tasks and acting out scenes also played a significant role in maintaining their focus.

The 7-year-old group was able to form simple sentences and engage deeply in discussions. They benefited from a mix of sentence formation activities, games, and active participation in role-playing tasks.

Comparative Observations:

There was a clear developmental trend: the older children (6 and 7 years old) demonstrated greater capacity for sustained attention, more complex vocabulary acquisition, and higher engagement levels compared to the younger children (5 years old).

The study highlighted that children aged 5 benefit most from visually engaging and kinesthetic learning methods, while older children (6 and 7) are ready to engage in more structured learning that involves both language production and comprehension.

The findings of this study suggest that the optimal age for beginning formal English language learning is around 5–7 years old. While younger children (5 years old) benefit from interactive and engaging methods, such as games and songs, their attention spans are shorter, limiting the effectiveness

of structured lessons. On the other hand, children aged 6 and 7 demonstrate greater cognitive readiness for more structured language acquisition, with improved vocabulary retention, longer focus durations, and increased ability to form simple sentences.

The results highlight the importance of adapting teaching methods to the developmental stage of the child. For 5-year-olds, the emphasis should be on playful, dynamic learning experiences that capitalize on their natural curiosity and shorter attention spans. For 6- and 7-year-olds, more structured lessons that integrate active participation, visual aids, and sentence-building tasks can promote deeper engagement and better language outcomes.

Ultimately, the study supports the idea that early exposure to English can have significant benefits for children's language development, but the methods used and the child's age should align to ensure that the learning experience is both effective and developmentally appropriate. The findings provide valuable insights for educators and parents, offering guidance on when and how to introduce English in a way that maximizes learning potential for children.

Discussion

The findings underscore the impact of age on language acquisition, focus, and engagement, contributing to the ongoing discourse on the optimal starting age for English learning in pre-school settings. By examining the performance of 5-, 6-, and 7-year-old children in a structured language learning environment, a clear progression in cognitive and linguistic capabilities is observed.

The results validate theoretical frameworks such as the Critical Period Hypothesis and Vygotsky's Socio-Cultural Theory. The 7-year-olds exhibited higher vocabulary retention and were capable of forming short sentences, indicating advanced cognitive readiness and a capacity for structured instruction. While 5-year-olds displayed enthusiasm for interactive and engaging activities, their limited focus duration (20–23 minutes) suggests that their learning should emphasize exploratory and play-based exposure rather than structured methods. This aligns with Kuhl's model of neuroplasticity, which highlights the benefits of early exposure but recognizes that structured learning may yield better results with increased maturity, as seen in the 6- and 7-year-old groups.

Interactive methods—such as games, songs, and visual aids—proved essential for engaging younger learners. For example, 5-year-olds showed the greatest engagement when participating in kinesthetic activities like "Run and Touch the Word." However, as children's cognitive and social skills develop, more complex tasks can be introduced. The 6-year-olds responded well to a combination of dynamic visuals, videos, and active tasks, which balanced engagement with structured language practice. For 7-year-olds, the addition of sentence formation and role-play demonstrated their readiness to integrate vocabulary into meaningful contexts.

Focus duration was a critical factor differentiating the age groups. While the 5-year-olds' attention span was capped at 20–23 minutes, older children were able to concentrate for 25–30 minutes with sustained engagement, particularly when tasks alternated between active and quiet activities. This progression highlights the growing capacity for attention regulation as children mature, reinforcing the argument for introducing structured learning around the age of 6–7 when attention spans are more conducive to formal instruction.

The findings have practical implications for curriculum design in pre-school education. For 5-year-olds, the emphasis should remain on creating immersive, play-based environments that introduce English through songs, games, and colorful visuals. For 6-year-olds, a gradual transition to structured activities, including dynamic flashcards and simple sentence practice, can build foundational skills. By the age of 7, children can engage in more formalized learning, integrating vocabulary acquisition with sentence formation, discussions, and role-play to foster language production.

While the study offers valuable insights, its limitations should be acknowledged. The sample size was small, and the observation period was limited to two weeks. Future research could explore larger and more diverse cohorts over an extended timeframe to validate these findings. Additionally, investigating the role of individual differences, such as prior language exposure and socio-cultural factors, would provide a more comprehensive understanding of optimal language learning strategies for pre-school children.

The study suggests that while early exposure to English benefits language development, structured learning should ideally begin around the age of 6–7. This period combines heightened neuroplasticity with cognitive and social maturity, enabling children to achieve better outcomes in language acquisition. By tailoring teaching methods to developmental stages, educators can create engaging and effective learning experiences that support young learners in their linguistic journey.

Conclusion

The study demonstrates the varied developmental readiness of children for learning English as they progress from ages 5 to 7. Younger children show limited language retention, indicating that early exposure is most effective when focused on simple and playful activities. By the age of 6, children demonstrate enhanced ability to engage with structured tasks, and by age 7, their comprehension and expressive abilities are notably stronger.

These findings emphasize the importance of tailoring language instruction methods to the developmental stage of learners, with particular focus on the balance between interactive play-based learning and structured teaching. The study underlines that a strategic approach to introducing English, depending on age and cognitive readiness, is key to effective language acquisition.

This developmental trend aligns with theoretical frameworks such as the Critical Period Hypothesis and Vygotsky's Socio-Cultural Theory, which suggest that cognitive, social, and linguistic maturation significantly impact learning outcomes. The study supports the conclusion that while early exposure to English provides foundational benefits, formal instruction is most effective when introduced at age 6 or 7, combining engaging methods with opportunities for structured language use. These insights are invaluable for educators and parents designing age-appropriate language learning programs.

References

1. Bruner, J. (1983). *Child's talk: Learning to use language*. Oxford University Press.
2. Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon Press.
3. Kuhl, P. K. (2010). Brain mechanisms in early language acquisition. *Neuron*, 67(5), 713–727. <https://doi.org/10.1016/j.neuron.2010.08.030>
4. Lenneberg, E. H. (1967). *Biological foundations of language*. Wiley.
5. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

THE ROLE OF MOTIVATION AND FLIPPED CLASSROOM TECHNOLOGY IN ENGLISH LANGUAGE TEACHING

Turdyeva Irada Nailevna

2nd year Master's degree student of KazUIRandWL, Almaty, Kazakhstan

Khairullaeva Venera Khibadullaevna

*Candidate of Philosophical Sciences, PhD Associate Professor,
KazUIRandWL, Almaty, Kazakhstan*

This review research paper aims to assess the effectiveness of the flipped classroom strategy on student performance. The purpose is to analyze the impact of the flipped classroom model on academic achievement and explore its potential benefits in enhancing student learning outcomes. The study is grounded in the theoretical framework of constructivism and active learning. It investigates the flipped classroom strategy, which involves a reversal of traditional teaching methods, where students engage with instructional content outside the classroom through pre-recorded lectures or online resources, allowing for more interactive and collaborative activities during class time

This article aims to assess the effectiveness of the flipped classroom strategy on 11th grade students. The purpose is to analyze the impact of the flipped classroom model on academic achievement and explore its potential benefits in enhancing student learning outcomes. The study is grounded in the theoretical framework of constructivism and active learning. It investigates the flipped classroom strategy, which involves a reversal of traditional teaching methods, where students engage with instructional content outside the classroom through pre-recorded lectures or online resources, allowing for more interactive and collaborative activities during class time.

Keywords: *Flipped classroom, active learning, student performance, academic achievement, engagement, critical thinking, constructivism, technology integration, inclusive education*

The computerization of educational institutions and the development of modern ICT had a significant impact on the educational process at school. Often in a modern school, students receive knowledge that does not meet the requirements that society imposes on school graduates today.

Due to the lack of classroom time and, in practice, the lack of personal communication between the teacher and the student during school time, there is a need to optimize the learning process by revising the traditional lesson model and transforming its classical structure. Today in front of teachers the challenge is how to rebuild the classroom in such a way that it is possible to use the lesson time as productively as possible.

To solve this problem, the creators of the "Inverted Classroom" model decided to completely change the structure of the lesson: swap the usual parts of the educational process (homework and classroom work) so that acquaintance with new material takes place at home, and practical tasks, discussions and fixing.

Flipped classroom or "inverted classroom" is a learning technology that is one of the types of so-called "blended learning". This lesson model assumes independent assimilation of the main or additional educational material at home when watching video lectures, reading educational literature, passing educational tests for initial assimilation of the topic, while classroom time is devoted to analyzing problematic issues of the theoretical part, as well as performing practical and creative tasks under the supervision of a teacher [3].

Obviously, the program in high school is full of educational material and involves studying computer science for one hour a week.

In the allotted time, it is difficult, and often impossible, to systematize the necessary amount of information and form stable practical skills among students using traditional means of classical pedagogy.

To implement existing computer science programs, we have to look for ways to increase the productivity of lessons.

The proposed "inverted training", in particular, provides for the rejection of such ineffective techniques in conditions of limited time as:

1) performance of students near the blackboard;

- 2) front-end survey;
- 3) dictation of notes;
- 4) watching long educational films and presentations

Instead, the "inverted classroom" technology activates elements of the pedagogy of cooperation: the teacher acts as a partner and consultant. Students master the educational material, to a large extent with self-study, which, in our opinion, contributes to the development of cognitive activity and independence [4].

Currently, the network community of "inverted teachers" has about 16,000 people. We conducted an experiment with the use of "inverted learning", which showed that such a lesson model forms the skills of independent work of students.

In the process of self-study of computer science, students develop such skills as:

- 1) independently plan your activities;
- 2) independently work with educational and additional literature;
- 3) extract the most significant information from the text, highlight the main thing
- 4) independently acquire and deepen knowledge;
- 5) analyze, compare;
- 6) repeat the studied material and consolidate the already studied;

7) repeatedly perform certain actions or activities that have the purpose of their assimilation, based on understanding of this goal and the general program of action and accompanied by conscious control and adjustment;

8) clearly and clearly express their thoughts, take into account the individual characteristics of their mental activity and physiological capabilities;

9) independently compare, prove, draw conclusions, formulate questions;

10) independently systematize the material.

The development of independent work skills is practically the main goal of training. After all, independence is one of the main qualities of students and the most important condition for their learning. It is obvious that the higher the level of independence of students, the more effective their promotion in educational activities [2].

Thus, the technology of "inverted learning" motivates students to independent activity, which in turn contributes to the formation of independence. erreid and Schiller (2013) made significant contributions to this field through their investigation into the impact of a flipped classroom model on the academic performance in a biochemistry course. They found students' performance in the flipped classroom significantly surpassed that of a control group, thus confirming the positive influence of this pedagogical approach on exam scores.

Lage, Platt, and Treglia's study in 2000 laid additional groundwork in this arena, demonstrating that students who participated in the flipped classroom approach in an introductory economics course achieved better final exam scores and overall course grades than their counterparts in traditional instruction models.

Strayer's 2012 study expanded the understanding of the flipped classroom's effect, focusing on student engagement in a college algebra course. The research discovered students experienced heightened engagement under the flipped classroom model, evident in higher attendance and participation rates, and task completion.

Bishop, J. L., & Verleger, M. A made significant contributions to this field through their investigation into the impact of a flipped classroom model on the academic performance in a biochemistry course[5]. They found students' performance in the flipped classroom significantly surpassed that of a control group, thus confirming the positive influence of this pedagogical approach on exam scores. Lage, Platt, and Treglia's study in 2000 laid additional groundwork in this arena, demonstrating that students who participated in the flipped classroom approach in an introductory economics course achieved better final exam scores and overall course grades than their counterparts in traditional instruction models. Strayer's study expanded the understanding of the flipped classroom's effect, focusing on student engagement in a college algebra course. The research discovered students experienced heightened engagement under the flipped classroom model, evident in higher attendance and participation rates, and task completion.

Pierce and Fox (2012) examined undergraduate chemistry students' perception of the flipped classroom approach. They discovered this approach fostered greater student engagement, active participation, and deeper conceptual understanding, therefore enhancing overall learning outcomes.

Gilboy, Heinerichs, and Pazzaglia's 2015 study extended the investigation to the field of nursing education, where the flipped classroom model led to increased student satisfaction and improved learning outcomes, demonstrating the model's cross-disciplinary utility.

Hew and Lo's 2018 systematic review across multiple disciplines strengthened the evidence for the positive impact of the flipped classroom strategy, citing enhancements in student satisfaction, engagement, and academic performance. Their work reinforced the notion that the flipped classroom model could be a universally applicable strategy for improving student academic performance.

Strayer (2017) made a particularly crucial contribution by investigating the flipped classroom approach's impact on students' critical thinking and problem-solving skills in a psychology course. The study identified the flipped classroom as a potent catalyst for improving cognitive abilities in students compared to traditional teaching methods.

McLaughlin et al.'s (2014) work added to the collective understanding of the flipped classroom's effects on problem-solving abilities in medical education. The study highlighted the approach's positive influence on students' ability to apply knowledge and utilize critical thinking skills.

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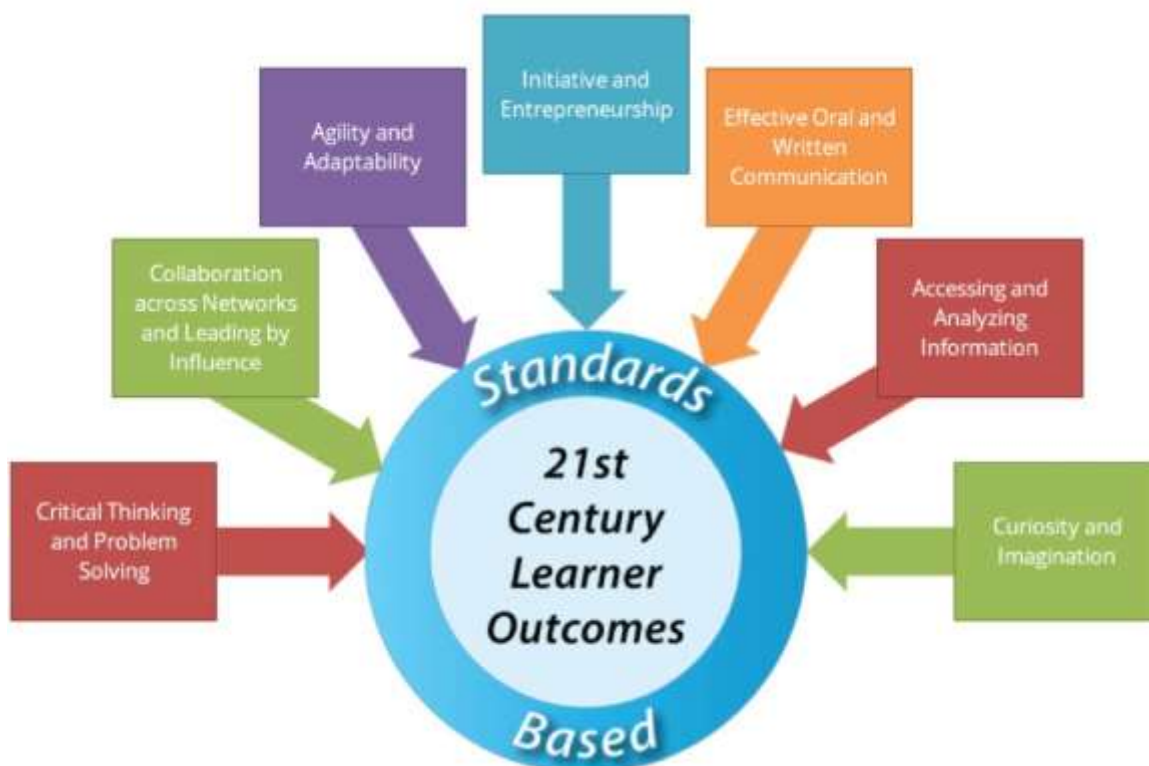


Figure 1. 21st century learner outcomes

It is in high school age for a teenager to become the most relevant understanding of the self, self-knowledge. is he allocates for himself a certain sphere of interests and activities, it is determined which

profession he wants to choose in the future. Based on the analysis of approaches to the study of senior school age several authors, it was concluded that can not be considered separately the physical maturation of the high school student and the social environment, as they affect the development of personality in a complex. Adolescence is critical, spasmodic, from the period of throwing and growth of spirit independence, the senior student is gradually moving towards awareness own values, understanding and acceptance of oneself, formation own personality.

Advantages of flipped classroom:

- The flipped classroom strategy improves student attendance and participation. With pre-class materials serving as a foundation for in-class activities, students recognized the importance of attending classes regularly and actively participating in discussions. This led to increased class attendance rates and more engaged classroom environments.
- The flipped classroom strategy promotes technology integration in education. The use of online resources, multimedia materials, and learning management systems played a central role in implementing the flipped classroom approach. Students developed digital literacy skills and became familiar with various technological tools, preparing them for the digital age.
- The flipped classroom strategy accommodates diverse learning styles and preferences. Students with different learning styles and preferences could engage with the course content in a way that suited their individual needs. Visual learners could watch videos, while auditory learners could listen to audio recordings, ensuring an inclusive learning experience for all students.
- The flipped classroom strategy encourages self-regulated learning. Students took responsibility for their learning by actively engaging with the pre-class materials, setting goals, monitoring their progress, and reflecting on their learning outcomes.
- The flipped classroom strategy facilitates individualized feedback and support. With pre-class activities providing a foundation, instructors had more opportunities to provide personalized feedback and address individual learning needs during in-class interactions. This targeted support helped students overcome challenges and enhance their understanding of the course material.
- 15. The flipped classroom strategy promotes a deeper understanding of complex topics. By introducing concepts before class, students had time to process information and develop initial comprehension. In-class activities then focused on deepening understanding, applying knowledge to real-world scenarios, and addressing any misconceptions, resulting in a more profound understanding of complex topics.
- 16. The flipped classroom strategy prepares students for lifelong learning. The skills and approaches developed in a flipped classroom, such as self-directed learning, critical thinking, problem-solving, and collaboration, are transferable skills that are valuable beyond the classroom. Students are better equipped to continue learning independently and adapt to new challenges in their academic and professional lives
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- The flipped classroom strategy prepares students for lifelong learning. The skills and approaches developed in a flipped classroom, such as self-directed learning, critical thinking, problem-solving, and collaboration, are transferable skills that are valuable beyond the classroom. Students are better equipped to continue learning independently and adapt to new challenges in their academic and professional lives[9].

Conclusion

To sum up, I can say that the potential of the flipped classroom strategy to bridge the gap between theory and practice. By engaging with pre-class materials that introduce theoretical concepts, students have a solid foundation to apply their knowledge during in-class activities that involve practical

applications, case studies, or simulations. This bridge between theory and practice enhances students' ability to connect concepts with real-world scenarios, preparing them for future professional endeavors. Moreover, the flipped classroom strategy encourages active learning not only for students but also for instructors. The role of the instructor shifts from a traditional lecturer to a facilitator of learning. Instructors have the opportunity to guide and support students' learning journeys, foster critical thinking, and provide individualized assistance. This dynamic teaching approach creates a collaborative and interactive environment that benefits both students and instructors.

References

1. Alekseeva E.E. Rol' matematicheskoy kompetentnosti v obespechenii ka-chestva obrazovaniya // *Sovremennye issledovaniya sotsial'nykh problem (elektronnyy nauchnyy zhurnal)*. 2017. T. 8. № 11–2. S. 12–17.
2. Alekseeva E.E. Kreativnoe sodержanie kak sredstvo formirovaniya kreativnoy kompetentsii studentov na zanyatiyakh vysshey matematiki // *Nauka Krasnoyars'ya*. 2014. T. 3. № 4. S. 39–49.
3. Miroshnikova N.N. «Perevernutyy klass» – innovatsionnaya model' v obuchenii inostrannym yazykam v vysshey shkole. *Cheboksary: TsNS «Interaktiv plus»*, 2016.
4. Cheburina O.V. Formirovanie umeniy samostoyatel'noy raboty na urokakh informatiki s ispol'zovaniem sovremennykh informatsionnykh tekhnologiy [Elektronnyy resurs]. URL: <https://cyberleninka.ru/article/n/formirovanie-umeniy-samostoyatelnoy-raboty-na-urokah-informatiki-s-ispolzovaniem-sovremennykh-informatsionnykh-tehnologiy>
5. Bishop, J. L., & Verleger, M. A. (2013). The flipped classroom: A survey of the research. In *ASEE National Conference Proceedings*, Atlanta, GA.
6. Chen, Y. L., Wang, Y. M., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education*, 79, 16-27.
7. Talbert, R. (2017). *Flipped learning: A guide for higher education faculty*. Stylus Publishing, LLC.
8. McLaughlin et al. (2017). The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system. *Journal of Educational Computing Research*, 55(8), 1137-1159.
9. Tucker, B. (2012). The flipped classroom. *Education Next*, 12(1), 82-83.
11. Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development*, 34(1), 1-1

THE ROLE OF ARTIFICIAL INTELLIGENCE IN ADAPTIVE LEARNING SYSTEMS FOR ENGLISH AS A SECOND LANGUAGE (ESL) EDUCATION

Uskenbayeva Malika Malikovna

Master student of South Kazakhstan State Pedagogical University named after O.Zhanibekov

Abstract

By establishing individualized, interactive, and effective learning experiences, the integration of Artificial Intelligence (AI) into English as a Second Language (ESL) education provides a revolutionary approach to language acquisition. Real-time feedback and customized learning paths that meet the requirements and preferences of each individual learner are made possible by AI systems that are driven by Natural Language Processing (NLP) technologies such as ChatGPT and ELSA Speak. This personalization improves retention, motivation, and engagement, especially when gamification components like leaderboards, streaks, and badges are included. AI provides inclusivity in ESL instruction by accommodating a variety of learning styles, including visual, auditory, kinesthetic, and reading/writing. This enables students to advance at their own speed and get knowledge that corresponds with their chosen learning modalities. The potential of AI to improve student performance, tailor instruction, and provide a more engaging learning environment is highlighted in this paper's exploration of the technology's use in adaptive ESL learning systems. It also talks about how AI technologies may fill in the gaps in conventional classroom settings, increasing the effectiveness and accessibility of ESL instruction.

Keywords: Artificial Intelligence, ESL Education, Personalized Learning, Adaptive Learning Systems, ChatGPT, ELSA Speak, Natural Language Processing, Learning Styles.

INTRODUCTION

The method in which that language is taught and learnt has changed significantly with the introduction of Artificial Intelligence (AI) into English as a Second Language (ESL) instruction. Personalized learning experiences are now at the forefront of ESL education thanks to AI's capacity to adjust to a variety of learning demands and styles. Learners are given real-time feedback, adaptive challenges, and immersive practice opportunities that are tailored to their specific progress and skill levels using AI-powered systems such as ChatGPT and ELSA Speak. Real-time performance analysis using AI technologies allows for task adjustments and personalized feedback to promote quicker learning and improved retention. AI ensures sure that every student has access to a learning experience that meets their needs by taking into account different learning styles, including kinesthetic, visual, auditory, and reading/writing. Additionally, gamification techniques like leaderboards, adaptive challenges, and badges greatly increase student motivation and engagement. AI has enormous potential to democratize ESL instruction and make it more efficient and accessible for students worldwide as it develops.

AI's Capabilities in ESL Education

The Potential of AI in ESL Instruction. Using Adaptive Algorithms for Personalization

AI-driven adaptive learning systems are built on personalization, which transforms conventional one-size-fits-all methods into dynamic, learner-centered experiences. To determine how to customize content and tempo to each student's needs, adaptive algorithms examine student data, such as performance metrics, engagement patterns, and areas of difficulty. This makes it achievable to provide personalized vocabulary drills, grammar exercises, and pronunciation lessons, guaranteeing that every learner's difficulties are successfully met.

A conceptual model of AI-driven adaptive systems was put out in Sri Lankan ESL schools to accommodate a range of skill levels. These systems divide students into bands based on preliminary evaluations and offer customized instruction. An expert learner could concentrate on improving fluency and grasping intricate grammatical structures, while a student who struggles with verb tenses might get basic tasks. (Sandaruwani, 2018) [1]

Research like that conducted by Abrar Mohammad Ali shows how technologies like ChatGPT may be used to customize learning. As a result of AI interventions that addressed particular faults and adjusted to each student's individual learning trajectory, teachers in these studies observed notable gains in their pupils' grammatical competency. Better results and more engagement are fostered by this real-time customisation. (Ali, 2023) [2]

Enhancements in Teaching Modalities

AI technology facilitates creative teaching approaches that improve language acquisition in a number of ways:

1. *Grammar Instruction:* ChatGPT and other AI programs mimic how grammar is used in everyday situations, including writing emails or creating conversations. They assist students comprehend and successfully implement rules by giving them prompt feedback and explanations (Ali, 2023; Sandaruwani, 2018) [1] [2]

2. *Listening Skills:* Rosetta Stone and other AI platforms that use voice recognition and speech synthesis technology make it easier to practice listening. By exposing students to real accents, intonations, and sentence stresses, these systems improve the effectiveness of comprehension exercises. (Ali, 2023) [2]

3. *Speaking Practice:* ELSA Speak and other AI-powered voice recognition software evaluate intonation, fluency, and pronunciation. By encouraging students to practice speaking without worrying about criticism, these resources help them become more confident and enhance their oral communication abilities (Sandaruwani, 2018) [1]

4. *Writing Skills:* Context-aware grammar, vocabulary, and syntax corrections are provided by programs such as Grammarly and GPT-based programs. These programs provide customized recommendations for growth based on the learner's competence level (Abstract). The most recent rel. (Ali, 2023) [2]

By using technology that enhances conventional teaching techniques, these modalities revolutionize ESL instruction. Personalized AI technologies, for instance, can bridge the gaps that may arise when teachers are unable to meet each student's unique demands in a classroom context.

The Role of NLP Tools Like ChatGPT

ESL training has been transformed by Natural Language Processing (NLP) systems like ChatGPT, which allow for individualized and interactive learning experiences. By simulating human-like conversations using sophisticated AI models, these technologies provide language learners the chance to hone their abilities in real time.

1. *Conversational Practice:* ChatGPT makes it easier to practice communication in a variety of settings, including meetings at work, travel, and informal discussions. This exercise helps students develop the spontaneity and contextual awareness that are essential for communicating in the real world.

2. *Evaluation of errors and Correction:* Real-time grammatical, spelling, and syntax problems are identified by NLP technologies, which also offer thorough justifications and examples. By correcting mistakes as they happen, this feedback speeds up the learning process.

3. *Contextual Learning:* ChatGPT helps learners grasp subtle use by producing examples based on their hobbies or line of work. For example, in customized situations, students might investigate the distinctions between concepts like "affect" and "effect."

4. *Customized Exercises:* Instructors can use natural language processing (NLP) technologies to make interactive courses, role-playing games, and customized quizzes. By offering pertinent and interesting knowledge, this not only lessens their workload but also improves the learning experience for the student.

5. *Feedback and Motivation:* ChatGPT's prompt and helpful feedback creates a positive learning atmosphere. The application helps students become more confident and motivated by showcasing their progress and encouraging them to try again

The difficulty of giving each student customized attention in big, heterogeneous classrooms is addressed by NLP technologies like ChatGPT. These resources mark a substantial advancement in democratizing ESL instruction, despite certain drawbacks including sporadic errors and a lack of cultural sensitivity. (Ali, 2023; Sandaruwani, 2018) [1] [2]

Enhancing Motivation Through Gamification in AI-Powered ESL Tools

When learning a language, motivation is essential, especially in self-paced settings where students must maintain their interest for lengthy periods of time. Gamification components are used by AI-powered systems to produce an engaging and goal-oriented learning experience. By making the process pleasurable and gratifying, these strategies not only maintain learners' attention but also promote improved results.

Systems of Reward

Reward-based elements are included into AI-powered services such as Duolingo to encourage ongoing participation. Leaderboards, streak counters, and badges motivate students to come back every

day and finish the activities. For instance, keeping up a streak encourages practicing constancy, and receiving badges for reaching milestones makes one feel accomplished. These gamified incentives work particularly well for students who are motivated by concrete proof of success. (Gorski, Gorski, & Tudorache, 2023; Sandaruwani, 2018) [3]

Adaptive Challenges

In AI systems, gamification also include dynamic task scaling according to student competency. Tasks get more complicated as users get better, guaranteeing a fair amount of difficulty. This flexible method avoids irritation from unduly challenging assignments and boredom from monotonous, simple activities. The equilibrium is consistent with Vygotsky's theory of the "zone of proximal development," which holds that students grow best when given activities that are just a little bit outside of their comfort zone but still doable with effort. (Ali, 2023; Gorski, Gorski, & Tudorache, 2023). [2] [3]

Community Attributes

Peer comparisons and group projects are examples of community-driven gamification that boosts motivation by encouraging healthy competition and social ties. Leaderboards motivate students to do better by showing them where they stand in relation to their classmates. In addition to improving language proficiency, cooperative activities like shared storytelling or group problem-solving foster a sense of community. This social component stimulates the natural desire to fit in and do well in a group. (Ali, 2023; Sandaruwani, 2018). [1] [2]

Practical Applications in ESL

1. *Role-playing and Simulations:* AI systems use gamified role-playing situations, such making a hotel reservation or placing an order at a restaurant, to give students real-world language application chances in an entertaining setting.

2. *Progressive accomplishment Levels:* To gamify the learning process and keep students interested in moving forward, platforms employ tiered accomplishment levels (beginning, intermediate, and advanced). At each level, more resources and content are unlocked.

3. *Personalized Learning Paths:* AI systems are able to customize challenges and rewards based on user performance, allowing gamification to be tailored to the preferences of specific learners. For example, a visual learner can benefit from problems with graphics, but an auditory learner would do well in games that require hearing.

Impact on Learning Outcomes

Studies demonstrate how well gamified elements may enhance student performance. According to a Duolingo research, gamification improved student motivation and self-regulation in addition to language competency. Additionally, by providing flexible and enjoyable ways to accomplish their objectives, gamified AI systems encourage engagement for students juggling a variety of obligations, such as employment or family duties.

Addressing Diverse Learning Styles Through AI

Designing successful ESL training requires an understanding of and ability to accommodate various learning styles. Because of AI's versatility, learning experiences may be tailored to the requirements of kinesthetic, visual, auditory, and reading/writing learners. This multimodal strategy increases engagement, guarantees inclusion, and boosts retention. (Lee, M., Park, H., Chung, J., 2020) [4]

Visual Learners

AI makes use of rich visual materials like infographics, graphs, and films for visual learners. These resources aid in clarifying difficult grammatical concepts or vocabulary relationships. For instance:

1) *Grammar Charts:* To make abstract ideas easier to understand, platforms employ vibrant flowcharts to illustrate tenses or sentence patterns.

2) *Interactive Videos:* To improve understanding, AI systems such as Google Classroom use visual lessons that allow students to pause, fast-forward, and engage with visual aides.

Additionally, vocabulary-building applications create visual links between words and visuals, which improves memory recall. AI may create flashcards, for example, where students match words to visuals.

Auditory Learners:

AI-powered voice recognition software is very helpful for auditory learners. Voice recognition and playback functionalities are used by platforms such as ELSA Speak and Duolingo to improve pronunciation and listening skills:

1) *Pronunciation Practice:* AI evaluates students' speech, spots mistakes, and gives them immediate feedback on their intonation, articulation, and stress.

2) AI systems provide audio-based listening comprehension activities, including simulated conversations or narratives, in which students must identify keywords or provide an MDPI summary of the material.

In addition to being interactive, these resources benefit students in honing their auditory abilities via consistent practice in a nurturing setting.

Kinesthetic Students

Interactive, practical exercises that mimic real-world language usage are beneficial for kinesthetic learners. This style is supported by AI through:

1) Activities that require students to physically move words or phrases to form sentences or match definitions are known as drag-and-drop exercises.

2) Role-playing simulations: AI-driven virtual worlds let students rehearse situations such as placing an order at a restaurant or handling a job interview. Offer immersive learning possibilities by simulating real-life interactions.

In order to accommodate kinesthetic inclinations, gamified platforms frequently incorporate movement-based tasks, such as choosing responses using mobile device motions.

Learners of Reading and Writing

For students who are learning to read and write, text-based tasks are crucial. AI customizes these interactions by producing customized cues and thorough feedback:

1) Writing essays: Programs such as Grammarly or ChatGPT offer structure enhancements, word recommendations, and grammatical repairs. Through repetitive practice, students may improve their writing.

2) Comprehension Questions: AI programs create tests based on reading passages to assist students in efficiently analyzing and synthesizing knowledge. EFL Café.

3) Vocabulary Development: AI improves lexical diversity and reading comprehension by providing word lists and contextual examples.

These characteristics guarantee that students who prefer textual, organized input have access to materials that play to their strengths.

Multimodal Integration for Diverse Learners

AI systems frequently combine these methods because they understand that students may benefit from a mix of approaches:

Interactive Stories: These narratives engage students in a seamless, multimodal experience by fusing text, images, and audio.

Adaptive Feedback: AI determines preferred modalities based on user behavior and modifies information delivery appropriately. For instance, students who watch videos a lot could be given more visual material, while those who do well on text-based assignments might be given more writing assignments. (Ling Wei, 2023) [5]

Benefits of Multimodal AI

Inclusivity: By accommodating a variety of learning styles, AI makes sure that no student is left behind.

Enhanced Retention: AI enhances both short-term comprehension and long-term retention by catering to learners' preferences.

Engagement: Multimodal material lessens boredom and maintains learners' motivation.

The effectiveness of AI-driven multimodal techniques in enhancing language results is continuously supported by research. For instance, research shows that when students interact with customized, interactive information, they significantly improve their grammar, vocabulary, and reading comprehension.

CONCLUSION

Artificial Intelligence (AI) has the potential to revolutionize the learning process by enhancing its efficiency, personalization, and engagement when included into adaptive learning systems for teaching English as a second language (ESL). Students can improve their language abilities in ways that traditional approaches cannot thanks to real-time, personalized feedback provided by AI technologies, especially those that use Natural Language Processing (NLP). By providing individualized grammar lessons, pronunciation practice, and listening comprehension activities, programs like ChatGPT and ELSA Speak are revolutionizing ESL training by catering to each student's particular learning preferences and requirements. With personalized help that enhances language fluency and retention, these systems let students advance at their own speed.

Learner motivation and engagement are further increased by using gamification components like leaderboards, adaptive challenges, and badges. AI-powered systems keep students' attention and promote regular practice by offering quantifiable objectives and incentives, which makes language learning both pleasurable and successful. It has been demonstrated that this gamified method increases motivation, especially for students who balance other obligations like employment or family. Additionally, AI's capacity to support a variety of learning styles—visual, aural, kinesthetic, and reading/writing—guarantees that every student may interact with the content in a way that suits them best, regardless of their chosen method of learning.

Despite these encouraging advancements, there are still obstacles in the way of completely incorporating AI into ESL classes, especially in environments with limited resources. To guarantee that AI tools may realize their full potential in enhancing language instruction for all students, concerns including uneven access to technology, the requirement for teacher training, and potential biases in AI algorithms must be addressed. However, AI offers a great chance to improve ESL training by offering individualized and flexible learning pathways that meet the demands of each learner. AI's position in ESL instruction is expected to grow as technology develops further, providing fresh approaches to assist language learners and enhancing language instruction's efficacy, accessibility, and inclusivity for a wide range of global populations.

References

1. Sandaruwani, N.W. B. (2018). Artificial intelligence education (AIEd) in English as a second language (ESL) classroom in Sri Lanka. *International Journal of Conceptions on Computing and Information Technology*, 6(1). https://ijcim.thesai.org/Downloads/Volume6No1/Paper_4-Artificial_Intelligence_Education.pdf
2. Ali, A. M. (2023). An intervention study on the use of artificial intelligence in the ESL classroom: English teacher perspectives on the effectiveness of ChatGPT for personalized language learning. *Journal of English Language Teaching*, 24(2), 120-134.
3. Gorski, A., Gorski, H., & Tudorache, P. (2023). Adaptive learning using artificial intelligence in e-learning: A literature review. *Education Sciences*, 13(12), 1216. <https://doi.org/10.3390/educsci13121216>
4. Lee, M., Park, H., Chung, J. (2020). Opportunities and challenges for AI in English language instruction. *Journal of Educational Technology in Higher Education International*, 17(2), 12–22.
5. Ling Wei. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology* Retrieved December 12, 2023, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.00001/full>

GAME-BASED TECHNOLOGIES IN TEACHING ENGLISH TO PRIMARY SCHOOL STUDENTS**Zhandarbek Aiyim Maratkyzy***Master student of South Kazakhstan State Pedagogical University named after O.Zhanibekov***Abstract**

In the digital age, where technology is deeply integrated into daily life, educators face the challenge of engaging young learners and maintaining their attention during the learning process. This is particularly true in primary education, where children's attention spans are often limited. To address this issue, the concept of edutainment—the fusion of education and entertainment—has emerged, with game-based learning (GBL) technologies playing a central role. This article examines the use of GBL in teaching English to primary school students, focusing on platforms like Kahoot, Quizizz, and teacher-designed interactive games. These tools are shown to increase student engagement, improve cognitive skills, and create dynamic, interactive learning environments. The article explores the benefits of GBL, such as enhanced motivation, reduced anxiety, and the development of critical skills like self-regulation and teamwork. Additionally, it discusses challenges such as technical limitations, student emotional intelligence, and the need for age-appropriate adaptations. Despite these challenges, the growing body of research highlights the potential of GBL to revolutionize education, offering significant benefits to both teaching and learning in primary schools.

Keywords: *Game-Based Learning (GBL), Edutainment, Primary Education, English as a Foreign Language, Kahoot, Quizizz, Digital Games in Education, Student Engagement, Cognitive Development, Emotional Intelligence (EI), Classroom Technology, Educational Technology.*

INTRODUCTION

In today's world, where technology and gadgets are integrated into nearly every aspect of life, educators face an increasing challenge: capturing students' attention and maintaining their focus during the learning process. Traditional methods of teaching are no longer sufficient to engage young learners, especially in primary education, where children are naturally curious, energetic, and often struggle with attention span. This challenge has given rise to the concept of "edutainment" – an educational approach that combines entertainment with learning to foster engagement and improve focus.

The importance of incorporating engaging and interactive methods in the classroom becomes even more apparent when teaching English as a foreign language to primary school students. Young learners possess unique developmental traits such as hyperactivity and a limited capacity for sustained concentration, which can hinder their ability to absorb new information through conventional teaching methods. In this context, game-based learning technologies emerge as a powerful tool to bridge the gap between effective learning and sustained student engagement.

The primary goal of this article is to explore the role of game-based learning technologies in primary education, with a specific focus on teaching English as a foreign language. It aims to examine how these technologies—such as digital platforms like Kahoot, Quizizz, and Bamboozle, as well as teacher-designed interactive games—can enhance student engagement, improve cognitive skills, and create a more supportive and dynamic learning environment. Additionally, this article seeks to identify the key challenges of implementing game-based learning and offer insights into how these tools can be effectively tailored to meet the developmental needs of young learners.

The role of the game-based technologies in modern education

From a historical perspective, researchers like Jean Piaget have emphasized the importance of games in development of young learners, highlighting their role in enabling children to interact meaningfully with their environment. However, the integration of games into classroom settings is a relatively recent phenomenon. The rapid evolution of social media, digital games, and other technologies has introduced new challenges for educators, particularly in maintaining students' motivation and engagement. (Rabah, J., Cassidy, R., & Beauchemin, R., 2018) [1].

For instance, earlier generations approached tasks like watching a cartoon with a sense of ritual. Completing chores and homework beforehand made the reward of a single uninterrupted hour of entertainment deeply satisfying. In contrast, today's children, influenced by platforms like TikTok and Instagram, where they can watch some short videos that are called Reels, are accustomed to brief bursts

of attention. This shift has resulted in diminished concentration and limited ability for self-directed learning, presenting significant challenges for modern educators.

In this context, game-based technologies have emerged as a vital tool for enhancing engagement. One key approach is gamification, which involves incorporating game design elements into non-gaming contexts, such as education. It is essential to differentiate between structured "games" (with clear objectives and rules) and "play for pleasure" (a creative and open-ended process), which together embody the concept of edutainment — a blend of education and entertainment.

Advantages of game-based technologies

The implementation of game-based technologies offers numerous benefits to the educational process. First and foremost, game-based activities significantly improve students' cognitive abilities by fostering higher-order thinking skills. They are particularly effective in low-risk tasks, such as Quizzes or Kahoot where students can practice and apply knowledge in a structured yet engaging manner.

By providing flexibility in participation, the former application enhances classroom instruction by enabling students to participate either alone or in groups. The platform's real-time feedback feature makes sure that students may identify and correct their errors throughout the lesson, interactively reinforcing important ideas, whereas, the latter, one of the most widely used GBL tools, is praised for its lively graphics and user-friendly interface. Kahoot quizzes are frequently used by teachers to introduce or review material, which makes learning fun and interesting. According to research, it effectively maintains students' interest and aids in their concentration on the lesson's goals. Additionally, the platform gives students instant feedback in the form of scores, allowing them to evaluate their performance and identify areas in which they may improve (Ahmad Ghazy, Majid Wajdi, Ikhsanudin, & Clary Sada., 2021) [2].

Secondly, game elements transform monotonous tasks into exciting challenges. Features like competition, collaboration, and social interaction energize students, encouraging them to actively participate in the learning process.

Thirdly, games create a supportive and low-pressure environment where students can explore and make mistakes without fear of failure. This approach not only reduces anxiety but also promotes the development of critical skills, such as self-regulation, teamwork, and confidence building.

Game-based technologies are not merely a means to make lessons entertaining; they address significant educational challenges posed by modern technological habits. By leveraging these tools, educators can adapt to the evolving needs of students, fostering an engaging and effective learning experience. For example, an article by Siti Nazleen Abdul Rabu and Zuliana Talib (2017) describes the use of Speed Word Game to develop vocals, privately, vocabulary related to applications describing people. The game is used as part of the game-based learning (GBL) approach to improve the memorization and use of English words, which consists of several lessons in which you need to memorize words, filling in gaps in words, removing letters (vowels, consonants, first and last letters). The game includes 24 applications for people, and students must coax this word by completing tasks in different lessons. For example, in one damage, all vowels are omitted, in another, all consonants, and so on. During the game, teachers receive feedback on their work, which allows them to better assimilate the material and motivate them to repeat the game in order to improve results. In addition, the study also uses an interactive multimedia application (IML) for vocal development, created using Microsoft PowerPoint. In IML, he learns to work with the same 24 words as in the game, but using texts, images, music and animation to improve the perception and understanding of the material. (Siti Nazleen Abdul Rabu, & Zuliana Talib, 2017) [3].

Speed World Game can be suitable for preschoolers if it is adapted according to the age characteristics of children. For example, for younger age groups, the tasks could be simplified and made the game more visual by using bright and large images instead of text, as well as reduce the response time. It is important to keep in mind that preschoolers may have limited reading and writing skills, so using pictures and other visual elements will contribute to better vocabulary acquisition.

However, younger children may need more guidance from an adult to help them master the game. The difficulty of the game and the speed must be adapted to their level of development so that it remains interesting and accessible.

According to the data analysis of a study conducted in 2020 by Alhebshi, A. A. and Halabi, M. S., (Alhebshi, A. A., & Halabi, M. S., 2020) both teachers and students had favorable opinions about the use of digital games for language learning. According to research by Petko et al. (2016) [4], who discovered a substantial correlation between educational technology and students' successful performance in the classroom, the results imply that DGBL enhances both teaching and learning skills in ESL. Students that

play digital games are more motivated and participate more in class activities, which improves learning results [5].

The study also emphasizes how playing digital games can make children feel less anxious, which fosters a calm environment that is ideal for learning. effectively learning experiences are produced when teachers are able to effectively organize class time and pay attention to the requirements of their pupils. Furthermore, DGBL has been demonstrated to increase students' passion and task focus, indicating that engagement is a critical component of both teaching and learning.

Overall, the results support the notion that digital games can enhance the ESL learning process by showing that DGBL has a favorable impact on teachers' classroom management abilities as well as students' cognitive abilities. Other researchers' studies, such as those by Majdoub (2016) [6] and Fithriani (2018) [7], have highlighted the benefits of using digital games to enhance students' communication and cognitive skills.

Contextual constraints (technical infrastructure, student characteristics)

One of the challenges mentioned is the lack of facilities and technology to support digital game-based learning. Some teachers found it difficult to implement this approach due to insufficient technological resources at schools. This restriction might make it more difficult to use digital games as a teaching tool. The authors also emphasized the versatility of the game-based learning approach by pointing out that traditional games could be utilized as substitutes in situations when digital tools are not available.

The authors such as A.D. Saputra, L. Septiani, R. Adriani and H. Sundari, also discussed how the efficiency of game-based learning can be impacted by students' interests and emotional intelligence (EI) (Saputra, A. D., Septiani, L., Adriani, R., & Sundari, H., 2021). For example, some research revealed that pupils with higher EI performed better in games when learning, but there was no discernible difference for those with lower EI. Furthermore, it was observed that some students behaved more like competitors than like cooperative learners, which can undermine the collaborative nature of game-based learning [8].

These elements highlight how crucial it is to take into account both the technical and student-related background when putting game-based learning methodologies into practice. To guarantee the effective use of this approach, educators are urged to evaluate the resources at their disposal as well as the requirements and interests of their pupils.

The other article written by Syahrial, Asrial, Kurniawan, D. A., Kiska, N. D., & Damayanti, L. (2022) touches on issues related to the accessibility of technologies and the need to adapt traditional games, such as Congklak, to the age of the students. In particular, it is stated that incorporating traditional games into the classroom improves student engagement and helps them better understand content that is appropriate for their age and traits (elementary school pupils). This implies that teaching strategies that use traditional games must be modified to fit the developmental characteristics of the students. This will enable more effective participation in the learning process and foster the development of a variety of values, including tolerance, environmental care, and love for the country [9].

CONCLUSION

In conclusion, game-based learning (GBL) is a revolutionary way to teach elementary school, particularly when it comes to teaching English to speakers of other languages. These tools have been shown to be successful in raising student engagement, developing cognitive abilities, and establishing a more encouraging, dynamic learning environment. They include digital platforms such as Kahoot, Quizizz, and interactive activities created by teachers. In addition to addressing the difficulties of holding young learners' attention, edutainment encourages deeper learning through gamified experiences by fusing education and enjoyment.

The benefits of GBL are obvious: it increases motivation, promotes involvement, and eases anxiety while fostering a lively and upbeat learning environment. Additionally, it enables students to study at their own speed while providing instant feedback to reinforce key ideas. For GBL to be completely successful, however, issues like technological constraints, student emotional intelligence, and the requirement for suitable age-group modifications must be resolved. To maximize the impact of game-based learning, educators must consider the resources at their disposal, the developmental traits of their students, and their emotional requirements.

Despite these challenges, the increasing amount of studies demonstrating the value of digital games in the classroom indicates that GBL is a crucial instrument for contemporary instruction, particularly in elementary school. The potential for game-based learning to improve young learners' social and cognitive development will only grow as technology advances. To guarantee that every kid has

the chance to participate, learn, and thrive in a quickly evolving educational environment, educators must keep investigating and modifying these resources.

References

1. Rabah, J., Cassidy, R., & Beauchemin, R. (2018). Gamification in education: Real benefits or edutainment? Retrieved from <https://www.researchgate.net/publication/325615804>
2. Ahmad Ghazy, Majid Wajdi, Ikhsanudin, & Clary Sada. (2021). The use of game-based learning in English class. *Journal of Applied Studies in Language*, 5(1), 67–78. <https://doi.org/10.31940/jasl.v5i1.241202>
3. Siti Nazleen Abdul Rabu, & Zuliana Talib. (2017). The effects of digital game-based learning on primary school students' English vocabulary achievement and acceptance. *Innovative Teaching and Learning Journal*, 1(1), 61–73.
4. Iten, N., & Petko, D. (2016). Learning with serious games: Is fun playing the game a predictor of learning success?. *British Journal of Educational Technology*, 47(1), 151-163. <http://dx.doi.org/10.1111/bjet.12226>
5. Alhebshi, A. A., & Halabi, M. S. (2020). Teachers' and learners' perceptions towards digital game-based learning in ESL classroom. *Journal for the Study of English Linguistics*, 8(1), 166–176. <https://doi.org/10.5296/jsel.v8i1.17353>
6. Majdoub, M. (2016). Promoting high school ESL learners' motivation and engagement through the use of gamified instructional design. Master's thesis, Concordia University.
7. Fithriani, R. (2018). Communicative game-based learning in efl grammar class: suggested activities and students' perception. *Jeels (Journal of English Education and Linguistics Studies)*, 5(2), 171-18. <http://dx.doi.org/10.30762/jeels.v5i2.509>
8. Saputra, A. D., Septiani, L., Adriani, R., & Sundari, H. (2021). Game-based English learning for young learners: A systematic review. *JEdu: Journal of English Education*, 1(3), 109-122. <https://doi.org/10.30998/jedu.v1i3.4752>
9. Syahrial, Asrial, Kurniawan, D. A., Kiska, N. D., & Damayanti, L. (2022). Teaching primary school students through local cultural games for improving positive characters. *International Journal of Instruction*, 15(3), 1047-1078. <https://doi.org/10.29333/iji.2022.15356a>

COMPARISON OF THE APPLICATION OF DIGITAL TECHNOLOGY IN HIGHER EDUCATION BETWEEN CHINA AND BELARUS UNDER THE "BELT AND ROAD" POLICY

Zhang Yumeng

*International Sakharov Environmental
Institute of Belarusian State University, Minsk, Belarus*

Abstract

With the deepening of the "the Belt and Road" initiative, international cooperation in the field of education has become increasingly frequent, in which digital education technology plays a crucial role. Especially in the higher education cooperation between Belarus and China, digital education technology has not only brought education closer between the two countries, but also promoted deep integration in academic, research, and cultural exchanges between the two sides. This article aims to explore in depth the current application status of digital education technology in Belarusian and Chinese universities in this grand context. We will see that although both countries have made significant progress in the digitization and networking of educational resources, they still face many challenges, such as the unification of technical standards and the balanced allocation of educational resources. At the same time, the article will also look forward to the future development trends of digital education technology, in order to provide new ideas and directions for cooperation between Belarus and China in the field of higher education, and promote education cooperation between the two countries to a new level.

Keywords: *The Belt and Road, educational digital technology, application status, challenges Development Trends, Cooperation Mechanisms, Data Security and Privacy Protection, Infrastructure Construction, Smart Campus.*

Introduction.

The "the Belt and Road" initiative aims to promote comprehensive exchanges and cooperation in the economic, cultural, educational and other fields of countries along the Belt and Road. As an important force to promote social progress and economic development, education's digital process is particularly important under the framework of the "the Belt and Road". Belarus and China, as important participants in the "the Belt and Road" initiative, have broad prospects for cooperation between their universities in the field of digital technology in education.

Methods

The theoretical and methodological basis of the work included: When writing this conference paper on the application of digital technology in education between the two countries, firstly, by reviewing and summarizing academic literature, policy documents, etc. in relevant fields at home and abroad, we aim to gain a deeper understanding of the historical background, development status, and theoretical basis of the application of digital technology in education. Secondly, conduct in-depth analysis of representative cases of educational digital technology applications, revealing the situations and potential problems in practical applications. In addition, processing and analyzing relevant data on the application of digital technology in education to reveal application effectiveness, existing problems, and future development trends. By comparing the practices and effectiveness of digital technology applications in education between China and Belarus, and drawing on advanced experience and practices. Based on the analysis, it is concluded that in the context of the "the Belt and Road Initiative", the application of digital education technology in Belarusian and Chinese universities has broad prospects, but also faces many challenges. In order to promote the in-depth development of digital cooperation in education between the two countries, it is suggested to strengthen the construction of technological infrastructure, optimize the allocation of educational resources, enhance cultural exchanges and language training, increase teacher training efforts, and strengthen awareness of data security and privacy protection. Through joint efforts, it is believed that the digital cooperation in education between China and Belarus in the context of the "the Belt and Road" will achieve more fruitful results.

Results

1、*The current application status of educational digital technology in universities in Belarus and China*

1.1 Current Status of Application in Belarusian Universities

The higher education system in Belarus is rich in resources, of high quality, and relatively evenly distributed. Belarusian universities actively develop and apply digital educational resources, including e-books, online courses, virtual laboratories, etc., to provide students with rich and diverse learning materials and interactive platforms. These resources not only enrich the teaching content, but also enhance students' learning enthusiasm and autonomy. In recent years, Belarus has actively promoted the digitalization of education by building convertible learning spaces based on modern digital technology, creating a more flexible and personalized learning environment for students. For example, Belarusian universities have utilized augmented reality (AR), virtual reality (VR), and mixed reality (MR) technologies to conduct immersive and experiential teaching activities, which have increased students' interest and effectiveness in learning. The digital literacy of knowledge dissemination entities is crucial for the effectiveness of embodied practice in international Chinese education knowledge dissemination. [1, p. 55] Subject based digital literacy is the driving force for the digital transformation and development of international Chinese education, and the knowledge dissemination subject is the knowledge element The integration and enhancement of digital literacy are fundamental forces driving the process of digital transformation; Driven by the embodied environment Under the action, the knowledge dissemination subject needs to enhance their digital competence and numbers even more. Character literacy to adapt to the embodiment of sustainable development environment One of the digital developments in international Chinese education It is to enhance the digital literacy of teachers, students, and educational administrators Ability, [2, p. 1-8]. Enhance the digital competence of international Chinese teachers and cultivate the digital literacy of Chinese learners. Belarusian universities are actively promoting the construction of smart campuses, integrating various intelligent systems and applications to achieve intelligent and efficient campus management. Smart campus not only improves the efficiency and quality of campus management, but also provides students with a more convenient and personalized service experience. In addition, Belarus actively participates in international digital education cooperation projects, such as conducting extensive cooperation with Chinese universities in scientific research and achievement transformation through platforms such as the China Belarus Industrial Park. These collaborations not only promote academic exchanges and resource sharing, but also provide more practical opportunities and employment choices for students from both countries.

Subject based digital literacy is the driving force for the digital transformation and development of international Chinese education, and the knowledge dissemination subject is the knowledge element The integration and enhancement of digital literacy are fundamental forces driving the process of digital transformation; Driven by the embodied environment Under the action, the knowledge dissemination subject needs to enhance their digital competence and numbers even more. Character literacy to adapt to the embodiment of sustainable development environment One of the digital developments in international Chinese education It is to enhance the digital literacy of teachers, students, and educational administrators Ability, [3, p. 46-49]. Enhance the digital competence of international Chinese teachers and cultivate the digital literacy of Chinese learners. Belarusian universities are actively promoting the construction of smart campuses, integrating various intelligent systems and applications to achieve intelligent and efficient campus management. Smart campus not only improves the efficiency and quality of campus management, but also provides students with a more convenient and personalized service experience. In addition, Belarus actively participates in international digital education cooperation projects, such as conducting extensive cooperation with Chinese universities in scientific research and achievement transformation through platforms such as the China Belarus Industrial Park. These collaborations not only promote academic exchanges and resource sharing, but also provide more practical opportunities and employment choices for students from both countries.

1.2 Current Status of Application in Chinese Universities

Since the implementation of the "National Education Digitalization Strategy Action" in early 2022, China has achieved significant results in promoting the digitization of higher education. The National Smart Education Platform not only provides rich online courses and learning resources, but also realizes the interconnection, sharing, and intelligent analysis of educational data, providing strong support for educational decision-making and management. Chinese universities have achieved optimized allocation and widespread sharing of educational resources through the construction of smart campuses, the development of online courses, and the promotion of Massive Open Online Courses (MOOCs). Especially during the COVID-19, Chinese universities quickly adapted to online teaching needs, ensuring the smooth progress of teaching activities. At the same time, China actively participates in international digital education cooperation, providing a large number of high-quality MOOC courses to university students

and learners around the world, and has released the international version of China's National Smart Education Public Service Platform, providing convenient learning opportunities for global users. The rapid rise of China's online education market has become an important component of the digital education field. During the epidemic, Chinese universities quickly adapted to the demand for online teaching, ensuring the smooth progress of teaching activities. At the same time, more and more online education platforms and enterprises are emerging, providing diverse learning choices and personalized services for students. Chinese universities widely use various digital teaching tools and equipment, such as intelligent blackboards, online homework systems, virtual simulation experiment platforms, etc. These tools not only enhance the interactivity and fun of classroom teaching, but also provide students with more convenient and efficient learning methods. China actively promotes the application of big data in education, providing support for personalized teaching and learning path planning by collecting and analyzing students' learning and behavior data. The application of educational big data not only improves teaching effectiveness and learning efficiency, but also promotes the balanced development of educational equity and high-quality educational resources.

2、Challenges Faced

2.1 Uneven application of technology

On September 30, 2016, China and Belarus issued a joint statement on establishing a comprehensive strategic partnership of mutual trust and win-win cooperation, emphasizing that both sides are willing to deepen cooperation in the field of scientific and technological innovation, promote cooperation between scientific research institutions, universities, enterprises, etc. in microelectronics, information technology, optical technology, mechanical manufacturing, and continuously improve the level of scientific and technological cooperation between the two regions; Continue to expand and strengthen cooperation in education, culture, and other fields. [7, p. 40] .Although both Belarus and China are actively promoting the digitization of education, there are still significant differences in technological infrastructure between the two countries. Belarus is relatively backward in terms of technological equipment and network coverage, which to some extent limits the effectiveness of digital technology in education. To improve this situation, intelligent classroom technology can be introduced, such as interactive whiteboards that provide touch and gesture recognition functions to enhance teacher-student interaction. Utilizing virtual reality (VR) and augmented reality (AR) to create an immersive learning environment, allowing students to conduct experimental operations, reproduce historical scenes, and enhance learning interest and effectiveness in the virtual environment. Reasonable use of remote collaboration tools such as Zoom, Microsoft Teams, etc., supporting real-time communication between teachers and students from multiple locations, crossing geographical limitations., These technologies can provide stable and easily accessible learning resources, helping to compensate for the shortcomings of technological devices. Although China has a strong technological foundation, it still needs to consider how to better adapt to the technological environment of different countries in cross-border cooperation, such as providing technical training and support to help Belarus enhance its capabilities in educational technology.

2.2 Unequal distribution of educational resources

Unequal distribution of educational resources is a common problem faced by higher education worldwide. In Belarus and China, despite efforts by the government and educational institutions to optimize resource allocation, the concentration of high-quality educational resources still exists. This poses a significant challenge to ensuring fair distribution of resources and enabling more students to benefit from digital cooperation in education. With the widespread application of digital technology in the education industry, education has become more accessible and equitable. In order to allocate educational resources more effectively, cloud computing technology can be used to achieve the sharing and distribution of educational resources, enabling high-quality educational resources to transcend geographical limitations and be utilized by more students. At the same time, using big data to analyze students' learning needs and performance can accurately push personalized learning resources and improve the efficiency of educational resource utilization. In addition, with the popularization of the Internet and the realization of distance education, online and offline hybrid teaching can make full use of high-quality educational resources to serve the backward areas. The application of digital technology in education has also made teaching more targeted and achieved personalized teaching. A large amount of digital media resources, virtual reality resources, game resources, experimental simulation resources, etc. are presented in front of students, allowing them to use their hands, brains, and various senses, which should be much better than the simple methods of teachers speaking and students listening before. In short, the application of digital technology has changed the current situation of the entire

education system, and should promote a significant improvement in the overall education level and better cultivate innovative talents with core competitiveness. Obtain learning resources such as Coursera, edX, etc. on MOOCs (Massive Open Online Courses) platforms, provide rich online course resources, and achieve global sharing of high-quality educational resources. It is also possible to establish a learning management system (LMS), such as Moodle, Blackboard, etc., to help educational institutions manage online courses, learning progress, student grades, etc., and improve teaching management efficiency. Establishing a personalized learning platform based on the national situation can use big data to analyze students' learning behavior and performance, push personalized learning resources and paths, and meet the different needs of students.

2.3 Insufficient international cooperation mechanisms

At present, the cooperation mechanism between the two countries in the field of digitalization of higher education is not yet sound, lacking long-term stable cooperation platforms and project support. This to some extent limits the depth and breadth of cooperation between the two parties. In order to strengthen international cooperation mechanisms, cross-border educational cooperation projects can be established to jointly develop educational technology products and promote in-depth exchanges and cooperation between the two countries in the field of educational technology. At the same time, an educational technology exchange platform can be established, and regular educational technology seminars and training courses can be held to promote the sharing and development of educational technology between the two countries. The two countries can use cloud computing services to provide elastic and scalable computing resources and storage space, supporting the smooth operation of large-scale online learning activities. Regularly conduct big data analysis to deeply mine and analyze educational data, identify problems and improvement points in the teaching process, optimize teaching strategies and resource allocation.

2.4 Data Security and Privacy Protection

With the advancement of digital education, issues of data security and privacy protection are becoming increasingly prominent. In cross-border education cooperation, how to ensure the secure transmission and storage of educational data, prevent information leakage and abuse, has become an urgent problem to be solved in the cooperation between both parties. In order to strengthen data security and privacy protection, encryption technology can be used to ensure the security of educational data during transmission, while establishing a data access and usage permission management system to strictly control data access and usage. In addition, the construction of data backup and recovery mechanisms can be strengthened to ensure timely recovery in case of data loss or damage. Add encryption technology to encrypt the storage and transmission of educational data, ensuring the security of the data at all stages.

Add access control and identity authentication, implement strict access control policies and identity authentication mechanisms to prevent unauthorized access and data leakage. Improve the data backup and recovery process, establish a comprehensive data backup and recovery mechanism, and ensure timely recovery in case of data loss or damage.

2.5 Cultural and language barriers

Cultural and language barriers are issues that cannot be ignored in international educational cooperation. There are significant differences between Belarus and China in terms of cultural background, education system, language habits, etc., which to some extent affect the effective application of digital technology in education. To overcome these barriers, multilingual learning resources and tools can be developed to help students and teachers overcome language barriers. At the same time, it can strengthen cultural exchanges and cooperation between the two countries, enhance mutual understanding and recognition of each other's cultures. In addition, virtual reality technology can be used to create cross-cultural communication scenarios, allowing students to experience learning and life in different cultural backgrounds in a virtual environment. Provide machine translation, offering real-time or offline machine translation services to help teachers and students overcome language barriers for communication. Establishing a multilingual learning platform: supporting learning resources and tools for multiple languages to meet the needs of students from different cultural backgrounds. Provide cultural sensitivity and adaptability training for students: develop relevant training materials and courses to enhance their understanding and adaptability to different cultures.

2.6 Shortage of teaching staff

The application of digital technology in education cannot be separated from a high-quality teaching staff. However, both Belarus and China are facing a shortage of teaching staff. Especially in the field of digital education, teachers with interdisciplinary knowledge and proficiency in digital technology

are even rarer. To address this issue, it is possible to strengthen teachers' digital technology training and enhance their interdisciplinary knowledge and abilities. At the same time, teachers can be encouraged to participate in international education cooperation projects to broaden their international perspective and teaching experience. In addition, teacher incentive mechanisms and career development paths can be established to attract more outstanding talents to join the field of digital education. By introducing online teacher training courses, we can provide online training courses on educational technology to help teachers improve their digital literacy and teaching skills. Establish a virtual mentor system to provide real-time guidance and feedback for novice teachers, accelerating their professional growth. To provide a platform for teacher career development, establish a teacher career development file and evaluation system, and support teachers' continuous learning and career advancement.

3. Future Development Trends and Suggestions

Faced with the wave of digital education, the two countries need to jointly seize development opportunities and address potential challenges.

3.1 Strengthen infrastructure construction

The two countries should jointly increase investment in the construction of digital infrastructure for education, especially in the network coverage and terminal equipment configuration of universities in remote areas. By optimizing the network environment and improving hardware equipment conditions, we ensure that all students can enjoy high-quality online education services. In 2019, education delegations from China and Belarus visited each other more than 70 times, and universities from both sides reached over 30 cooperation agreements based on mutual agreement. The Ministry of Education of China and Belarus officially signed an important agreement recognizing the academic degree certificates of the other party, which has broad influence. Under the influence and drive of the "Belarus Education Year" in China, some domestic higher education institutions have established several "China Belarus Research Centers". [5, p. 11]

At the same time, we will promote the construction of a digital education resource library for joint construction and sharing, achieve widespread sharing of high-quality educational resources, break geographical limitations, and promote educational equity.

3.2 Improve international cooperation mechanisms

In order to deepen cooperation between the two countries in the field of digital education, a long-term stable cooperation mechanism should be established. This includes strengthening policy communication to ensure collaboration between both parties in the direction of digital education development; Strengthen project coordination and jointly carry out joint scientific research and teaching projects; Strengthen talent cultivation and exchange, promote the deep integration and development of higher education between the two countries through student exchange activities and other means. During the 2019 "Belarus Education Year" in China, various higher education institutions in China and Belarus collaborated to hold multiple joint thematic forums, program performances, and seminar conferences. They also organized a higher education themed summer camp for middle school students - the Dalian University of Technology Belarusian State University 2023 International Summer Camp project. [4]

3.3 Strengthen data security and privacy protection

In the process of promoting digital education, data security and privacy protection are important aspects that cannot be ignored. The two countries should jointly strengthen the construction of data security management systems, implement strict technical protection measures, and ensure the security and privacy of educational data. At the same time, we will strengthen cooperation and communication in the field of data security, jointly address the challenges of data security in the digital age, and provide solid security guarantees for the development of digital education.

3.4 Promote the innovative application of digital education

In July 2022, the sixth meeting of the China Belarus Education Cooperation Subcommittee was held, and both sides held consultations on further deepening cooperation in education digitization, higher education, vocational education, two-way study abroad, language teaching, and industry university research application, and reached consensus. [6] Both countries should actively explore new models and paths for innovative applications of digital education. Utilize advanced technologies such as artificial intelligence and big data to optimize teaching content and methods, enhance teaching effectiveness and learning experience. Promote the widespread application of blended learning models, combining the advantages of traditional and online teaching, to provide students with more flexible and diverse learning methods. At the same time, we will strengthen cooperation and communication in remote

education, virtual laboratories, and other areas to jointly promote innovation and application of digital technology in education.

Discussion

This article delves into the development trend of digital education and puts forward specific suggestions for cooperation between the two countries. The digitization of education, as an important transformation in the field of education today, is profoundly affecting teaching modes, learning methods, and the allocation of educational resources. In this process, both countries face common opportunities and challenges. Strengthening infrastructure construction is the cornerstone of the digital development of education. Especially in remote areas, improving network coverage and terminal device configuration is crucial to ensuring educational equity. At the same time, the jointly built and shared digital education resource library will greatly promote the widespread dissemination and effective utilization of high-quality educational resources. Improving international cooperation mechanisms is the key to promoting the deepening development of digital education. Through policy communication, project alignment, and talent cultivation exchanges, the two countries can jointly explore new models and paths for educational digitization, achieving deep integration and development of higher education. The digitization of education has also brought new challenges to data security and privacy protection. Establishing a sound data security management system and technical protection measures, strengthening cooperation and exchanges between the two countries in this field, are necessary conditions for ensuring the healthy development of digital education. Promoting digital innovation and application in education is an important direction for cooperation between the two countries. Utilizing advanced technology to optimize teaching content and methods, exploring blended online and offline teaching models, and strengthening cooperation in distance education, virtual laboratories, and other areas will bring new development opportunities for education in both countries. Digitization of education is a significant transformation that both countries are facing in the field of education. By strengthening infrastructure construction, improving international cooperation mechanisms, enhancing data security and privacy protection, and promoting innovative applications of digital education, the two countries can jointly seize this historical opportunity and promote the comprehensive development and progress of the education industry.

References

1. Wang Yuan, Ye Yuhu. Comparative Analysis of Higher Education Status between China and Belarus [J]. *International Exchange in Education*, 2024 (01): 55-59
2. Wang Chunhui. Trends and Reflections on the Digital Development of International Chinese Education [J] *Journal of Yunnan Normal University (Teaching and Research of Chinese as a Foreign Language Edition)*, 2023, 21 (02): 1-8
3. Wang Yuan, Ye Yuhu The "the Belt and Road" helps China and Belarus unleash the potential of cooperation in higher education [J]. *Shenzhou Scholars*, 2024 (04): 46-49
4. Liu Leyuan Educational Exchange and Cooperation between China and Belarus under the the Belt and Road Initiative [J]. *Non lingual Studies*, 2023 (00): 157-164
5. Cao Peishan, 2018. Investigation and Analysis of Chinese Language Learning Motivation among Students at the Confucius Institute of Belarusian State University [D]. Tianjin: Tianjin Normal University
6. Ministry of Education: "Tian Xuejun presides over the sixth meeting of the Education Cooperation Subcommittee of the China Belarus (Russia) Intergovernmental Cooperation Committee", 2022-07-27, http://m.moe.gov.cn/jyb-xwfb/gzdt-gzdt/moe_1485/202207/t20220727-2649238.cn
7. Joint Statement of the Ministry of Foreign Affairs of the People's Republic of China and the Republic of Belarus on Establishing a Comprehensive Strategic Partnership of Mutual Trust and Win Win Cooperation [EB/OL] (2016-09-30) [2019-10-22].
https://www.fmprc.gov.cn/web/gjhdq_676201/gj_676203/oz_678770/1206_678892/1207_678904/t1402587.shtml

E-LEARNING TECHNOLOGIES IN MODERN EDUCATION: OPPORTUNITIES AND CHALLENGES**Zharkynbek Gulnaz Zhaksybekkyzy**

Ozbekali Zhanibekov South Kazakhstan Pedagogical University

Annotation

E-learning plays a pivotal role in modern education by providing access to quality educational resources while overcoming geographical and socioeconomic barriers. It fosters flexible, personalized, and active learning, allowing students to manage their time and educational resources independently. The integration of technologies such as artificial intelligence, virtual and augmented reality, and gamification significantly enhances student interaction with content, making the learning process engaging and productive. However, the development of e-learning faces challenges, including inadequate infrastructure, insufficient teacher training, and declining student engagement. Limited internet access and a lack of technical skills hinder the integration of technologies into educational processes, particularly in remote and underserved areas. Addressing these challenges requires a strategic approach, including professional development for educators, alignment of technologies with curriculum goals, and the design of platforms that encourage active student participation. This study highlights the importance of innovative solutions to improve accessibility, engagement, and effectiveness in digital learning, establishing e-learning as an integral part of the future educational landscape.

Abstract

The term "e-learning," first introduced in the 1990s, represents the use of electronic devices for teaching and learning purposes. This concept has evolved into a pivotal element in modern education, offering unique opportunities and facing distinct challenges. E-learning technologies provide accessibility, flexibility, and personalized learning environments that transcend geographical barriers and socioeconomic divides. They support active learning by fostering student engagement through interactive tools and collaborative platforms. However, the effectiveness of e-learning is often hindered by insufficient infrastructure, a lack of teacher training, and challenges in maintaining student engagement. Advanced solutions like Artificial Intelligence (AI), Virtual and Augmented Reality (VR/AR), and gamification present innovative approaches to address these barriers. This paper examines the benefits, challenges, and potential strategies for implementing e-learning technologies effectively, emphasizing their critical role in transforming the educational landscape.

Keywords: *E-learning, digital education, accessibility, gamification, artificial intelligence, virtual reality, student engagement, personalized learning, teacher training*

Introduction

COVID-19 significantly increased the demand for e-learning technologies, reshaping how education is delivered and received. The term "e-learning," which emerged in the 1990s, is broadly defined as the use of electronic devices for academic purposes. Ellis et al. describe e-learning as a method to improve student learning by leveraging digital communication technologies. Similarly, Rodrigues characterizes e-learning as a modern educational approach that is interactive, learner-focused, and personalized, utilizing digital tools to enhance academic experiences. Gonzales-Videgaray further views e-learning as a pedagogical interaction between teachers and learners facilitated through the web. Although no single definition captures all aspects of e-learning, its evolution has highlighted its critical role in modern education.

Opportunities of E-Learning

One of the most significant advantages of e-learning is its ability to make education accessible to a diverse range of students. By leveraging digital tools, e-learning eliminates geographical barriers, enabling learners from rural and remote areas to access high-quality educational resources. Karishma Qureshi et al. note that this accessibility is particularly beneficial for students who would otherwise lack exposure to advanced learning materials. Furthermore, e-learning addresses socioeconomic disparities by providing affordable access to resources that are often out of reach in traditional learning environments.

Flexibility is another hallmark of e-learning. Unlike traditional classroom settings, e-learning allows students to tailor their schedules to their personal and professional commitments. Dhawan highlights this "anytime, anywhere" learning model as a significant innovation, enabling learners to pursue education without the constraints of fixed schedules. This flexibility not only fosters self-directed learning but also empowers students to take greater responsibility for managing their time and resources, as Means suggests. During crises like the COVID-19 pandemic, this flexibility proved essential in ensuring the continuity of education for millions of students worldwide. E-learning also promotes active learning, a pedagogical approach that encourages students to engage deeply with the material through interactive and collaborative activities. Digital tools such as gamification, multimedia content, and virtual discussion forums create dynamic learning environments that capture students' interest and foster motivation. Bonwell and Eison argue that these features allow learners to engage in critical thinking and problem-solving tasks, which are essential for higher-order learning.

Freeman adds that well-structured e-learning platforms can enhance analytical and decision-making skills by presenting information in multiple formats, catering to diverse learning styles. For instance, gamified elements like leaderboards and badges introduce an element of competition, making learning more enjoyable and memorable. Moreover, e-learning enables students to interact with educational content at their own pace, allowing for a more personalized and adaptable learning experience.

Challenges of E-Learning

Despite its potential, e-learning faces significant challenges that impede its widespread adoption. A major barrier is the lack of reliable infrastructure, particularly in underprivileged and rural areas. Yang and Shadiev (2020) highlight the disparity in internet access and the availability of digital devices, which prevent many students from participating in online education. This digital divide exacerbates educational inequality, leaving marginalized communities at a disadvantage.

In addition to connectivity issues, platform design and technical reliability pose challenges. Golonka et al. (2014) point out that some e-learning platforms are not user-friendly, making it difficult for students and educators to navigate. Moreover, technical failures, such as server outages or software glitches, disrupt the learning process, as Stockwell (2007) notes. These issues highlight the need for robust and reliable technological infrastructure to support e-learning effectively.

The success of e-learning hinges on the ability of educators to effectively integrate digital tools into their teaching practices. However, many teachers lack the necessary training to navigate the complexities of e-learning technologies. Hampel and Stickler (2005) emphasize the importance of targeted professional development programs that equip teachers with both technical skills and an understanding of digital pedagogy. The Technological Pedagogical Content Knowledge (TPACK) framework proposed by Mishra and Koehler (2006) underscores the need for educators to understand the interplay between technology, pedagogy, and content. Without adequate training, teachers struggle to adapt traditional teaching methods to virtual environments, particularly for activities requiring interactivity and collaboration.

Engagement is a cornerstone of effective learning, yet it remains a significant challenge in e-learning environments. Virtual platforms often fail to replicate the immersive and interactive aspects of face-to-face education. Stockwell (2007) observes that this lack of interaction can lead to disengagement and reduced motivation among students. Yang and Shadiev (2020) further note that the isolation inherent in online learning environments can exacerbate feelings of detachment, making it difficult for students to remain actively involved. Additionally, Kirschner et al. (2003) highlight the cognitive demands of navigating complex interfaces and managing multiple applications, which can overwhelm students and hinder their learning outcomes.

Future of e-Learning Technologies

AI has revolutionized e-learning by enabling personalized and adaptive learning experiences. Means et al. (2014) highlight AI's ability to analyze student performance and tailor lesson plans to individual needs, enhancing both engagement and knowledge retention. AI-driven tools also serve as virtual tutors, providing instant feedback and guidance, as Luckin et al. (2016) observe. Beyond instructional roles, AI automates administrative tasks like grading and attendance tracking, allowing educators to focus on more impactful activities (Holmes et al., 2019).

VR and AR technologies offer immersive learning experiences that were previously unattainable. Dunleavy et al. (2009) describe how these tools enable students to explore complex concepts through virtual labs or historical simulations, fostering deeper understanding. Cheng et al. (2020) emphasize AR's role in providing practical training remotely, particularly in technical fields like science and engineering.

Additionally, Jowsey et al. (2020) highlight the collaborative potential of VR, allowing students to work together in shared virtual spaces.

Gamification introduces game-based elements into learning, enhancing motivation and engagement. Hamari et al. (2016) note that features like rewards and leaderboards make learning enjoyable and competitive. Kapp (2012) underscores gamification's role in improving knowledge retention, while Burguillo (2010) highlights its ability to develop critical thinking and problem-solving skills.

Strategies for Effective Implementation

For e-learning to achieve its potential, strategic implementation is crucial. Professional development programs should focus on equipping educators with the skills needed to integrate technology effectively. The alignment of e-learning tools with curriculum goals ensures that technology enhances learning outcomes rather than detracting from them (Laurillard, 2012). Interactive content and collaborative platforms should be prioritized to maintain student engagement and foster active participation.

Conclusion

E-learning technologies have transformed education, offering accessibility, flexibility, and engagement. However, challenges such as infrastructure limitations, inadequate teacher training, and student disengagement must be addressed. By leveraging advanced technologies like AI, VR/AR, and gamification and adopting strategic approaches to implementation, educational institutions can create inclusive, dynamic learning environments that meet the needs of diverse learners. These efforts will ensure that e-learning continues to evolve as a powerful tool in modern education.

References

1. Bonwell C.C., Eison J.A. *Active Learning: Creating Excitement in the Classroom*. ASHE-ERIC Higher Education Report No. 1, George Washington University, 1991.
2. Cheng K., Wang Y., Song H. *Exploring the Use of Augmented Reality for Remote Practical Training in Science Education*. *Int. J. Sci. Educ.*, 2020, vol. 42, no. 5, pp. 769–789.
3. Dhawan S. *Online Learning: A Panacea in the Time of COVID-19 Crisis*. *J. Educ. Technol. Syst.*, 2020, vol. 49, no. 1, pp. 5–22.
4. Dillenbourg P., Järvelä S., Fischer F. *The Evolution of Research on Collaborative Learning*. In: Balacheff N., Ludvigsen S., de Jong T., Lazonder A., Barnes S. (Eds.), *Technology-Enhanced Learning: Principles and Products*. Springer, 2009, pp. 3–19.
5. Dunleavy M., Dede C., Mitchell R. *Affordances and Limitations of Immersive Participatory Augmented Reality Simulations for Teaching and Learning*. *J. Sci. Educ. Technol.*, 2009, vol. 18, no. 1, pp. 7–22.
6. Ellis R., Ginns P., Piggott L. *E-learning in Higher Education: Some Key Aspects and Their Relationship to Approaches to Study*. *Higher Educ. Res. Dev.*, 2009, vol. 28, no. 3, pp. 303–318.
7. Freeman S., Eddy S.L., McDonough M., Smith M.K., Okoroafor N., Jordt H., Wenderoth M.P. *Active Learning Increases Student Performance in Science, Engineering, and Mathematics*. *Proc. Natl. Acad. Sci. U.S.A.*, 2014, vol. 111, no. 23, pp. 8410–8415.
8. Golonka E.M., Bowles A.R., Frank V.M., Richardson D.L., Freynik S. *Technologies for Foreign Language Learning: A Review of Technology Types and Their Effectiveness*. *Comput. Assist. Lang. Learn.*, 2014, vol. 27, no. 1, pp. 70–105.
9. Hamari J., Koivisto J., Sarsa H. *Does Gamification Work? A Literature Review of Empirical Studies on Gamification*. *Proc. Annu. Hawaii Int. Conf. Syst. Sci.*, 2014, pp. 3025–3034.
10. Hampel R., Stickler U. *New Skills for New Classrooms: Training Tutors to Teach Languages Online*. *Comput. Assist. Lang. Learn.*, 2005, vol. 18, no. 4, pp. 311–326.
11. Holmes W., Bialik M., Fadel C. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston, MA: Center for Curriculum Redesign, 2019.
12. Jowsey T., Foster G., Cooper-Ioelu P., Jacobs S. *Blended Learning via Virtual Classrooms: Strengths, Limitations and Recommendations*. *Australas. J. Educ. Technol.*, 2020, vol. 36, no. 3, pp. 1–15.
13. Kapp K.M. *The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education*. San Francisco: Pfeiffer, 2012.
14. Kirschner P.A., Sweller J., Clark R.E. *Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching*. *Educ. Psychol.*, 2006, vol. 41, no. 2, pp. 75–86.

15. Laurillard D. *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology*. Routledge, 2012.
16. Luckin R., Holmes W., Griffiths M., Forcier L.B. *Intelligence Unleashed: An Argument for AI in Education*. London: Pearson, 2016.
17. Mayer R.E. *Multimedia Learning*. Cambridge: Cambridge University Press, 2009.
18. Means B., Toyama Y., Murphy R., Bakia M., Jones K. *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. U.S. Department of Education, 2014.
19. Mishra P., Koehler M.J. *Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge*. *Teach. Coll. Rec.*, 2006, vol. 108, no. 6, pp. 1017–1054.
20. Rodrigues H., Almeida F., Figueiredo V., Lopes S.L. *Tracking E-Learning Through Published Papers: A Systematic Review*. *Comput. Educ.*, 2019, vol. 136, pp. 87–98.
21. Stockwell G. *Vocabulary on the Move: Investigating an Intelligent Mobile Phone-Based Vocabulary Tutor*. *Comput. Assist. Lang. Learn.*, 2007, vol. 20, no. 4, pp. 365–383.
22. Yang J.C., Shadiev R. *Review of Research on Mobile Technology for Language Learning: An Analysis of Issues and Trends*. *Lang. Learn. Technol.*, 2020, vol. 24, no. 2, pp. 1–24.
23. Rodrigues H., Almeida F., Figueiredo V., Lopes S.L. *Tracking e-learning through published papers: A systematic review*. *Comput. Educ.*, 2019, vol. 136, pp. 87–98.
24. Yu J., Bekerian D.A., Osback C. *Navigating the digital landscape: Challenges and barriers to effective information use on the internet*. *Encyclopedia*, 2024, vol. 4, no. 4, pp. 1665–1680

Philological sciences

THE VOCABULARY THAT CONSTITUTES THE LANGUAGE PICTURE OF GENERATION Z

Sabrina Badalova

Master of philological sciences,
KazIR&WL named after Ablai Khan, Kazakhstan, Almaty

Abstract

Generation Z is the most influential group of people at this point in the 21st century. They are controlling the social media — the place where trends become commonalities. Language has become no exception. There is an array of new words and expressions that originated on the internet and made it into the real life. The article explores how those elements of vocabulary that have been popularized because of Gen Z are not random but reflect many aspects of life of this digital generation.

Keywords: Generation Z, language, social media, linguistic habits

Throughout the centuries, the evolution of society has entailed the development of the language of its people as those two concepts are tightly interconnected. The values, traditions, thought process, and the overall culture and history of a certain nation is reflected in its language. It is not uncommon to look for the answers to the question about a specific society by analyzing its mother tongue, but what will the analysis show if we zoom out and look at the linguistic evolution not of one nation, but a whole generation?

The generation that has defined roughly the first quarter of the twenty-first century is generation Z. Those are the individuals that were born between 1997 and 2012. Zoomers, as they are colloquially referred to, along with millennials became the first young competent users of social media and the internet in general. There is no argument that they are the first representatives of digital generation and for that reason have dominated the world wide web. Knowing that, one cannot be hesitant to admit that the language landscape of our age is being shaped by generation Z, since they are the ones who, using social media, promote their lingo.

It used to be an assumption that professional jargon, internet slang and abbreviations were not acceptable to be used in an everyday conversation with people of all walks of life and were best limited to its specific area of exploitation; however, zoomers are the ones who have normalized not filtering their speech for real-life daily communications. It is stylistically appropriate for generation Z to say out loud for the older generations to hear and without being concerned about being understood whatever verbiage that would typically be put in a shortened internet post where it belongs.

All of those words that the representatives of generation Z have incorporated into the daily life of most people who live in the 21st century are, metaphorically speaking, puzzle pieces that when put together depict different aspects of a typical life of a zoomer.

To begin with, while talking about generation Z and their linguistic habits, it is impossible to omit the fact mentioned earlier that they are a digital generation. Thus, most of the vocabulary that they use is one way or the other connected to the internet and everything that it encompasses.

One of those words is '**podcast**'. This lexeme was coined in 2004 and is a portmanteau of 'iPod' and 'broadcast'. For some, a podcast is a newfound radio for, even though some podcasts have a visual recording, it is designed to convey information through audio only [1]. In fact, the studies show that the rates of reading have declined in the past decade, and there are articles on the internet explaining why podcasts are a more efficient way of quenching thirst for knowledge than reading [2]. To name a couple, it allows extreme multitasking (not many people can juggle several tasks with a book in their hands and eyes glued to the text), it is more convenient as it can easily be accessed without the need to leave the house. The concept of podcasting perfectly captures the digital nature of zoomers, since it has become one of the primary ways through which they consume information [3].

Other two words that have quickly become a part of a typical Gen Z lifestyle are '**YouTuber**' and '**Tik Toker**'. They come from the name of such social media platforms as 'YouTube' and 'Tik Tok' and define a content creator who posts their videos on those apps. In the 21st century it is practically

impossible to disperse with those occupation-defining words, as there is a bevy of zoomers who make a living on those platforms, and those are the terms that they use to describe their profession. Granted, 'YouTuber' or 'Tik Toker' are not the traditional words to characterize a vocation, but they are tremendously common in our day and age especially among the youngest working generation.

Back in the day, people mostly used to watch films, TV programs, soap operas, etc. These days, the youths prefer **vlogs**. The word 'vlog' is a blend of 'video' and 'blog', where the latter is an abbreviation of 'weblog'. Basically, it describes a personal log in the form of videos. There is an array of young people on YouTube who post vlogs at certain intervals of time: daily, weekly, biweekly, monthly. That is one of the ways how YouTubers make a living in a digital world. One might assume there can be no appeal found in watching 30-minute videos that show a regular person's daily life. However, gen Z would beg to differ. For a generation, whose social connections are mostly made and maintained online and whose skills are digitally-based, being interested in promoting the vlog culture is rather fitting. Instead of checking up on their friends, they update their YouTube recommendations to see if any of their favorite vloggers have posted new videos. A lot of the regular viewers of vlogs claim in the comments section that the people behind the screen that update them on their day-to-day activities have become like real-life friends to them. While enjoying a vlog with a cup of coffee, they pretend being on a FaceTime call with a friend, when in reality they are watching a video of a person they do not know and probably will never meet. One way or the other, vlogging has become an important part of a daily routine for some and quite indispensable for others.

Another word that rather accurately reflects the prosaic days of generation Z is **binge-watching**. That word combination describes an activity of watching several episodes of a TV show in close succession. According to various sources, it was first used in that sense roughly in the end of 1990s and the beginning of 2000s. Once again, it shows how digitalized the life of zoomers is. Back in the day, it did not use to be the case to spend hours and hours in front of the screen indulging in the same TV series. People simply did not have that option as the only thing they could watch was TV, and it rarely had the same show on without breaks. 'Binge-watching' is a way of entertaining oneself that is inherent to generation Z.

Living in a digital world where a lot of the daily activities have become reachable at one click — the internet provides all sorts of information, online shopping platforms reduce the time people spend on wandering around the stores, work has become remote — made generation Z accustomed to that quick and easy lifestyle. Even making money now does not take much time. In fact, one Tik Toker was indignant about the fact that for a short video that he had spent an hour on he only earned 4000\$. The key word here is 'only', when in reality people with traditional jobs do not make that kind of money in a month. However, plenty of zoomers do not imagine their life any other way.

Speaking about professions, one of the occupations that has been on the rise during the reign of generation Z on the internet is '**influencer**'. It is rather common and goes back to the Shakespearian time when it meant a powerful religious figure as well as heavenly bodies that have an influence on human lives, according to astrology of that time; however, the contemporary connotation of that word, the one that means a public figure and/or a trendsetter with a substantial social media following who is seen as a mentor of their generation, only started to develop in the 21st century [4]. Nowadays it is a legitimate profession that does not require any qualifications apart from the blue tick nick to the influencer's name on social media and even that is not a necessity. All and sundry can become an influencer if they are popular or dedicated enough to consistently upload on social media. In many ways, it is impossible to the generation Z working lifestyle without mentioning their craft of influencing.

That quick and easy working lifestyle can all be summarized as **gig economy** which is also a term coined in the beginning of the current century. A word 'gig' is borrowed from the music industry, where performers would have gigs as short-term artistic engagements. It is another way of making money but one that does not require long-term obligations. In the 21st century the term 'gig economy' describes a labor market that has a prevailing number of temporary workers and short-term contracts. Once again, that kind of state of how business is done excellently captures the way generation Z prefers to work: temporary job, quick money and no extended contracts. There have even been talks about zoomers not complaining about doing a 9/5 job and their employers being unsatisfied with their performance. A case might be made in favor of that generation that they as a group on average are just not mentally equipped to the never-changing, slightly boring and tiresome work routine that the previous generations have become accustomed to [5].

Gen Z is the generation that struggles gravely when it comes to relationships. One of the reasons for that is them growing up in a semi-digital time and eventually moving all of their social connections

online, to a place where it is challenging to know something for sure or, in this case, being certain about another person's intentions. As a consequence, even their relationship style has changed, and new words have been coined to define it. One of them is **situationship**. It is a blend of two words and mean a relationship status with low levels of personal commitment. For older generations it would hardly be an adequate way of being involved with someone romantically; however, zoomers seem to be comfortable with it, despite multiple obvious complications that it might entail, as a result of their high levels of tolerance and a fear of commitment. They literally popularized a new relationship status and made a word for it that is being used by people of various educational backgrounds even though that term is not officially in the dictionary yet [6].

Not only do Gen Z create a term situationship out of fear of commitment, but they also repurposed another existing lexeme to describe one of their avoidance behaviors. This term is **'ghosting'**. Ghosting someone means avoiding their calls, not replying to their texts and basically going full MIA on them despite of the previous level of intimacy the people in question have had. It is not hard to guess why the word 'ghost' was chosen to explain that pattern of behavior. When a person is giving someone a silent treatment or avoiding them altogether, they act like a ghost who is presumably there but cannot be seen or heard.

On top of everything described above, generation Z are also known for their tolerant nature which is reflected in their values and beliefs. They are very careful about not offending certain groups of people and show acceptance for plenty of non-traditional ways of life. Zoomers are of the opinion that no one should be discriminated on the basis of their race, sexual orientation, looks, etc. That is one of the primary reasons why they popularized such a term as **'body shaming'**. This word means humiliating and mocking a person because of the imperfections of their body [7]. Another term that is tightly connected to that one is **'body positivity'** which is also a salient example of the most distinctive Gen Z vocabulary. It defines a state of mind when instead of feeling ashamed of supposed bodily faults, one looks at themselves through the lens of acceptance and understanding that they are beautiful in their own way. These two commonly used pieces of Gen Z vocabulary are demonstrative of one aspect of tolerance that this generation exudes.

While dissecting the frequently encountered elements of politically correct lexicon of zoomers, it is incidental to pinpoint the word that have been on the rise because of the fourth wave of feminism that fell on the conscious years of generation Z. During this period some words were formed and others were brought back into everyday use.

One of the terms that was thrown around right, left, and center is a portmanteau **'mansplain'** whose origin is traced back to 2008. It defines the act by a male to explain in layman's terms certain things to a female assuming that she would not understand by herself. It has a negative connotation as it implies that men are more knowledgeable by nature and, incidentally, women need to have more things explained to them. Needless to say, the word carries a certain level of condescension [8]. Another similar neologism that was popularized in the early 2010s is **'manspread'** which is also a blend of two words 'man' and 'spread'. It describes a male pose of sitting with their legs wide apart in public transport, thus making it less comfortable for the people around them. Back in the 20th century, such words would have never been brought into vogue as the perception of men and women was drastically different despite feminism being already in full swing; however, as we can clearly see, Gen Z has an alternative view on this issue, and as a result words like 'mansplain' and 'manspread' have come into use to show how certain aspects of this generation's picture of the world have shifted.

Neologisms are not the only terms that generation Z has developed an appeal to. Some of the words that have existed for centuries have also been brought back into everyday use. One of them is **'patriarchy'**. In the 21st century, it has been assigned a negative connotation as generation Z has employed it to mean the lack of respect for women. The feminist message that Gen Z is trying to send with that word is that women are meant to be empowered and in order to achieve that patriarchy has to be abolished. Once again, social beliefs of generation Z find a more concrete footing in the words that zoomers use to convey their views.

Generally, there is no shortage of words and word-combinations that have been popularized or repurposed because of generation Z and their habitual lifestyle. Some of them include [9]:

Table 1

Words that have been popularized or repurposed by generation Z.

Gen Z word	Meaning
<i>Rizz (n)</i>	<i>an innate ability to seem attractive to others.</i>
<i>Goated (adj)</i>	<i>an adjective that derived from the slang abbreviation G.O.A.T. that means 'greatest of all time' and defines someone who is particularly good at something specific.</i>
<i>Glow up (n)</i>	<i>a phrasal verb turned into a noun that is circulating mostly in the female community and means the drastic positive change in appearance.</i>
<i>Stan (n)</i>	<i>a fan of a celebrity.</i>
<i>Salty (adj)</i>	<i>a new way of describing someone who is upset or annoyed about something.</i>
<i>Low-key (adv or adj)</i>	<i>of a low intensity.</i>
<i>Google (v)</i>	<i>look up something on the internet.</i>
<i>CEO (n)</i>	<i>The absolute best at something.</i>
<i>Drip (n)</i>	<i>a fashionable style.</i>

All in all, generation Z's vocabulary thoroughly reflects their life and work style, daily habits, and even their preferred state of mind. By looking at the words that the youths of our time use, one could easily infer the main features of those people. That, once again, shows a tight link between language and society and how those two phenomena develop in pace with each other.

References

1. Hello Yoqo. 9 words that define the 21st century. URL: <https://www.yuqo.com/words-of-the-21st-century/> (accessed August 16, 2024)
2. Mackenzie Kilano. The power of reading. URL: <https://www.michigandaily.com/opinion/the-power-of-reading/> (accessed August 16, 2024)
3. Kia Davis. Why I stopped reading books... and got hooked on podcasts. URL: <https://www.linkedin.com/pulse/why-i-stopped-reading-booksand-got-hooked-podcasts-kia-davis> (accessed August 16, 2024)
4. Benjamin Veschi. Etymology of influencer. URL: <https://etymology.net/influencer/> (accessed August 16, 2024)
5. Oxford English Dictionary. Gig economy. URL: https://www.oed.com/dictionary/gig-economy_n?tl=true (accessed August 16, 2024)
6. Sanjana Gupta. Situationship: How to cope when the commitment is unclear. URL: <https://www.verywellmind.com/what-is-a-situationship-5216144> (accessed August 16, 2024)
7. Oxford English Dictionary. Body shaming. URL: https://www.oed.com/dictionary/body-shaming_n?tl=true (accessed August 16, 2024)
8. Merill Perlman. 'Mansplaining' and its offspring. URL: https://www.cjr.org/language_corner/mansplaining.php accessed August 16, 2024)
9. Maryn Liles. 50 Gen Z slang word you need to know to keep from becoming 'cheugy'. URL: <https://parade.com/1293898/marynliles/gen-z-slang-words/> accessed August 16, 2024)

LANGUAGE OF INTERNET MEDIA IN AZERBAIJAN AND PROBLEMS OF STYLE

Sura Seyid

Doctor of philosophy in philology, associate professor
Nakhchivan State University<https://orcid.org/0000-0002-5628-0959>**Abstract**

Internet linguistics is a field of linguistics advocated by British linguist David Crystal. It studies new language styles and forms that have emerged under the influence of the Internet and other new media such as short message service (SMS) text messaging.[1][2] Ever since the beginning of human-computer interaction (HCI), leading to computer-mediated communication (CMC) and Internet-mediated communication (IMC), experts such as Gretchen McCulloch[3] have recognized that linguistics plays an important role in terms of web interface and usage. Learning emergent language on the web can help improve conceptual organization, translation, and web usage. Such research aims to benefit both linguists and web users alike.[4]

The study of Internet linguistics can be done through four main perspectives: sociolinguistics, education, stylistics, and applied linguistics.[1] It has evolved as a result of subsequent technological advances, including the development of the Internet as a corpus and the dissemination and influence of stylistic variations brought about by the spread of the Internet through mass media and literary works. Given the increasing number of users connected to the Internet, defining the linguistic future of the Internet remains a goal. Because new computer-mediated technologies continue to emerge, and people continue to adapt their language to these new media.[5] The Internet continues to play an important role in both motivating and distracting people from language use.[6]

In this study, the issues of language and style of Azerbaijani internet media are discussed in detail, the scale and importance of the topic are investigated, and then cases of deviation from language and style norms in internet media are analyzed with concrete examples. Then, the causes and ways of solving language and style problems are investigated.

Keywords: internet journalism, style, grammar, integration, linguistics

Due to the rapid development of the Internet, problems of language and style are of great importance in Internet media in the Azerbaijani language. The lack of quality and correct language and style has a negative impact on the understanding of information and its influence. This problem is observed not only in the Azerbaijani internet media, but in all post-Soviet countries. How our language develops in the conditions of globalization and digitalization, how it preserves its national characteristics is also the topic of the article. Unlike traditional mass media, it is important to provide online audiences with simpler, more understandable and more interesting content.

Establishing an interactive relationship with readers, taking into account their opinions and suggestions also plays an important role in Internet media. Text, video, sound, graphics and animations are used interrelatedly in modern internet media. This calls for a richer and more colorful language and style. Unfortunately, some journalists working in the Internet media are not sufficiently aware of language and style norms and do not pay enough attention to linguistic rules, which causes these problems. We can group the problems we encountered during our research on Internet media as follows:

□ Weakness of regulatory mechanism - lack of sufficient mechanism for regulation of language and style norms in Internet media, weak control in this area leads to continuation of the problem.

□ Use of slang - The language and style used by the Internet media to reach a younger audience sometimes violates literary norms. This also leads to the introduction of jargon and dialect elements that are popular among young people.

□ Lack of modernity and interest - Sometimes the language and style used in the internet media do not meet modern trends and do not attract the interest of young people and readers. Presentation form, choice of language and stylistic appeal are weak.

□ Non-observance of linguistic rules - improper use of terms, neologisms and other language units and features that do not comply with language norms are observed in the Internet media.

Cases of deviation from language and style norms in the Internet media are mostly observed with violations of grammar, spelling, terminology and other language norms. This is observed in the text with the weakness of thought, morphological and grammatical errors.

It is important that the authors of the Internet media content take a more serious approach to language rules, spelling and grammar. In particular, this work can be solved with the supervision and editing of professional editors. In addition, Internet media can benefit from language and style standards established in traditional mass media. So, how to determine the ways to solve the problems of language and style in the Internet media?

□ Organization of training and courses on language and style norms for Internet media journalists.

□ Establishment of institutions that control Internet media content and define language and style standards.

□ More systematic implementation of editing and linguistic expertise of Internet media texts.

□ Sharing and learning the language and style practices of traditional media with Internet media.

□ Synthesis of traditional and innovative approaches

Conclusion and recommendations. Systematic approach and consistent measures should be implemented to solve language and style problems in Internet media. Reforms such as formation of language policy in Internet media, strengthening of regulatory mechanisms, integration of traditional and new media can play an important role in training professional personnel in this field and solving the problem.

Literature

1. "Language Development via The Internet". *ScienceDaily*. February 28, 2005. July 6, 2018 tarixində [arxivləşdirilib](#). İstifadə tarixi: January 9, 2024.

2. *JSTOR Crystal David Crystal*.

3. McCulloch, Gretchen, *Because Internet, Books on Tape*, 2019, [OCLC 1151437829](#).

4. Martín del Pozo, Maria Angeles. "Linguistics and web usability; Research Paper". *No Solo Usabilidad (Not Just Usability)*. 4. May 8, 2005. [ISSN 1886-8592](#). 2019-08-14 tarixində [arxivləşdirilib](#). İstifadə tarixi: 2014-02-15.

5. Kilgariff, Adam; Grefenstette, Gregory. "Introduction to the Special Issue on the Web as Corpus" (PDF). *Computational Linguistics*. 29 (3). September 2003: 333–347. [doi:10.1162/089120103322711569](#). 2023-10-05 tarixində [arxivləşdirilib](#) (PDF). İstifadə tarixi: 2024-01-09.

6. Cunliffe, Daniel; Herring, Susan C. "Introduction to Minority Languages, Multimedia and the Web". *New Review of Hypermedia and Multimedia*. 11 (2). December 2005: 131–137. [doi:10.1080/13614560512331392186](#).

ANCIENT TURKIC BOOK "BLESSED KNOWLEDGE" BY JUSUF BALASAGYN

Zayra Zhumadilova

PhD, professor, Kazakh National Agrarian University, Almaty (Kazakhstan)

ДРЕВНЕТЮРКСКАЯ КНИГА «БЛАГОСЛОВЕННЫЕ ЗНАНИЯ» ЮСУФА БАЛАСАГЫНА

Зайра Жумадилова

PhD, Казахский Национальный аграрный
исследовательский университет, г.Алматы (Казахстан)**Abstract**

The object of study of this article is a Turkic-language monument - the ancient book "Kutadgu Bilik" by Yusuf Balasagyn. The book is a moral and ethical program of the Kazakh people and has social significance. The author talks about the socio-political system of the Turkic state, the ideological and moral principles of the state elite.

For the Turkic people, on a subconscious level, the idea of the stability of existence conveyed by the author of "Blessed Knowledge" is more important.

Аннотация

Объектом изучения данной статьи является тюркоязычный памятник - древняя книга «Кутадгу билик» Юсуфа Баласагына. Книга является нравственно-этической программой казахского народа и имеет общественное значение. Автор рассказывает об общественно-политическом строе тюркского государства, идейно-нравственных принципах государственной элиты. Для тюркского народа на подсознательном уровне важнее представление о стабильности бытия, передаваемого автором «Благословенного знания».

Keywords: Turkic civilization, statehood, history, kaganate, culture, poem, image.

Ключевые слова: тюркская цивилизация, государственность, история, каганат, культура, поэма, образ.

У казахов есть два крупных литературных памятника эпохи Караханидов: первый – это «Кутадгу билик» Юсуфа Баласагына, а второй – произведение Махмута Кашгари «Дивани лугат ат-тюрк». Юсуф Баласагын написал «Кутадгу билик», что означает «Благодатное знание», за восемнадцать месяцев [1, С.3].

«Кутадгу билик» Юсуфа Баласагына считается попыткой автора рассказать об устройстве тюркской государственности более чем 10 веков назад: ее системе управления, этике государственных служащих, отношениях правительства с обществом, философию управления страной, в целом о культуре тюркского народа.

Как говорит автор перевода на казахский язык книги «Кутадгу билик» Бекарыс Нуриман, это произведение было подарено правителю государства Караханидов Табгашу Арслану хану Богратегину. В своем труде, имеющем глубокое общественное значение и являющимся нравственно-этической программой тюркского народа, Юсуф Баласагын исследовал вечно актуальные вопросы морали, нравственности, чести, справедливости и закона, семьи и воспитания.

«Кутадгу билик» - это сокровище всего тюркского народа, поэтому книга «Кутадгу билик» признана ЮНЕСКО общим духовным сокровищем человечества, а 2019 год был объявлен ЮНЕСКО «Годом «Кутадгу билик», - добавил молодой исследователь.

Введение обязательного изучения в рамках школьной учебной программы либо факультативов исторических памятников культуры тюркских народов, на наш взгляд, даст возможность подвигнуть их к саморазвитию и самовоспитанию, отдавая дань уважения к культурным ценностям предков, и в соответствии с общечеловеческими ценностями.

Большой Алтай – это огромный регион, включающий Россию, Казахстан, Китай и Монголию. Жители этих современных государств называют Алтай своей родиной. А когда родина одна на всех, то и одна для всех история. Алтай с его резко континентальным климатом есть прародина тюрков. Именно эти факторы – преобладание степей над горами для среды

обитания тюркского общества и очень суровые условия жизни - стали вызовом для зарождения тюркской цивилизации.

И регион Большого Алтая, не имеющий четких территориальных границ в современном геополитическом пространстве, связан многовековыми историческими, культурными корнями, традициями, которые обуславливают особенности существования и развития тюрко-монгольского мира. В связи с этим изучение поэмы Ю. Баласагына имеет важное научное значение с позиции литературы, языка, истории и является ценным наследием, необходимым для исследования и познания повседневной жизни, мировоззрения, обычаев, средневекового образа жизни родов и племен. Так, аллегорические герои Кунтогды и Уздылмиш олицетворяют «справедливость» и «разум». Следовательно, рассматриваются как вечные категории мира. Айтолды и Одгурмыш олицетворяют «счастье», «государство» и «довольство». Соответственно, они интерпретированы как категории временные и изменчивые. Основная борьба и конфликт происходят между вечными и временными явлениями. По мнению Баласагына, только благодаря вечным ценностям человек и общество могут обрести гармонию и избежать хаоса.

Не секрет, что среди обывателей до сегодняшнего дня бытует мнение о том, что тюрки не имели ни истории, ни культуры, ни литературы, а тем более государственности, т.е. не относились к цивилизованному обществу. И только в последние два-три столетия начал проливать свет в этом вопросе. Тюркская цивилизация стала признаваться как древнейшая, уникальная и универсальная цивилизация со своим зарождением и развитием, спадами и подъемами. Чтобы доказать предвзятость подобных «авторитетных» заявлений, необходимы разносторонние исследования в литературно-лингвистических, философско-исторических, культурологических аспектах. И «Кутадгу билик» Юсуфа Баласагына в этом смысле является одним из лучших образцов подлинного мастерства в ранней литературе тюркского народа.

Е.И. Кычанов, определяя характер кочевой государственности, впервые обратил внимание на специфику кочевого общества и осознанию уникальности форм государственного устройства средневековых кочевников. «К сожалению, приходится констатировать, что данная проблематика является одной из слабо разработанных» [2, С. 301-302]. Верно и наблюдение А.Ш. Кадырбаева, ученика Е.И. Кычанова, говорящего о традициях преемственности между кипчакским государственным объединением и предшествующих ему государственных и этнополитических объединений, существовавших на территории Казахстана [3, С.19]. Исследования так же подтверждают, что на территории Поволжья формировалось население с изначальным европеоидным расовым типом, которое постепенно синтезировалось со второй группой древнего населения центральноазиатского происхождения по монголоидному расовому типу. Эта ассимиляция продолжалась около трех тысячелетий в истории тюркской цивилизации. [4, С.117]

В научной литературе тюркскую цивилизацию зачастую заменяют термином «номадическая цивилизация», что, заметим, крайне ошибочно.

Во-первых, номадическая цивилизация охватывает не только степи Евразии, но и афразийские степи: «... на сегодняшний день ясно, что «практически все характерные черты «неолитического образа жизни» (культивация и domestikация растений, оседлый образ жизни, возникновение архитектуры, появление кладбищ) возникли задолго до позднего эппалеолита и раннего неолита; что миграции позднего верхнего палеолита Евразии и Северной Африки были, как миграция из Передней Азии в Северную и Восточную Африку/ и в обратном направлении». [5, С.29]

Во-вторых, тюркская цивилизация – это не только номадизм, но намного сложнее: ее следует рассматривать как единое целое, объединяющее как кочевой, так и оседлый образ жизни одновременно, с каменными глинобитными городами, торговыми рынками, развитой наукой, преобладанием материального над духовным, религиозностью, причем широким распространением мировых религий, в особенности ислама. Так, тюркская цивилизация необходимо включает в себя и оседлый, и кочевой миры.

Через сохранившиеся исторические памятники, такие как «Кутадгу билик» имеется возможность воссоздать историю тюркского народа. В последнее время тюркологическими исследованиями охвачены многие страны, особенно Китай и Турция. Но уже сегодня, как явствует из археологических исследований, на территории проживания тюркских народов со времени мезолита существовали самостоятельные культуры, которые, благодаря наличию

кочевого компонента, объединяющего всю цивилизацию, вступали во взаимодействие друг с другом.

Именно номадизм определил формирование своего собственного пути постижения мира и законов взаимодействия с ним, наиболее полно выразившегося в тенгрианстве с его космоцентрической картиной мира. Номадизм определил и такие качества и особенности, как чрезвычайно высокий интеграционный потенциал, доминирование духовного над материальным, устного способа передачи информации над письменным, способность к восприятию инноваций и достижений других народов, внутренняя свобода и независимость, а также совершенно особый тип государственности и экономики, основанной на скотоводческом способе хозяйствования.

Новые исследования ученых-археологов С. Ш. Аязбековой и С.Аязбекова могут пролить свет на этот вопрос. По мнению ученых, период зарождения тюркской цивилизации уходит далеко за пределы I тыс. до н.э. «...В этой культурной общности, просуществовавшей до II в. до н.э., четко прослеживается деление на земледельцев и воинов-кочевников, обеспечивающих земледельцам мирную жизнь. Кроме того, выявлена генетическая связь языка царских скифов и древнетюркского языка, а также восхождение тюркских эпосов «Алпамыш», «Урал Батыр», «Кер-оглы», «Деде Коркут», к образам скифов», - пишет С. Ш. Аязбекова [6, С.67]. Эту мысль подтверждают и исследования С.А. Плетневой, разработавшей свою классификацию кочевого хозяйствования древних тюрков [7, С.23]. во взаимосвязи с уровнем развития социально-политической организации и государственности. Согласно классификации, у половцев наблюдалась на тот период вторая ступень кочевания, т.е. «полукочевье», являвшееся немаловажным условием для создания своего ханства. Такого уровня достигали приднепровское и донецкое объединения. К началу монгольского ига половцы подошли к третьей ступени «полуоседлости» и могли создать собственное государство, хотя этому не случилось сбыться по причине вторжения монголов. В этой связи особенно интересным, на наш взгляд, являются те определения, которые дает Юсуф Баласагун о необходимой и полезной деятельности купцов (торговцев), ученых и мудрецов в развитии человеческого общества. Высокий уровень развития товарно-денежных отношений издревле в государствах, населенных тюркскими племенами в целом, и международных в частности, связан в первую очередь их транзитным расположением на Великом Шелковом пути. Соответственно купечество составляло влиятельную социально-экономическую прослойку общества в тюркоязычных государствах. О необходимости и полезности вклада деятельности купцов (торговцев) в хозяйственную деятельность государства Юсуф Баласагуни писал так:

Торговцы земледельцу не сродни:

Торговлей прибавляются они.

«Где что продать» – мечту лелея эту,

Спешат купцы, идут по белу свету.

Там взять, а там отдать – вот их удел.

Они других не знают в жизни дел.

Не будь купцов, нам всем жилось бы хуже –

Брели б мы сами по жаре и стуже.

Не странствуй люд торговый – мы едва ли б

Заморский шелк и жемчуг увидали б». [1, с. 144–145]

Важно заметить, что тенгрианская цивилизация, а также ее «сыновние цивилизации» в силу доминирования номадического компонента становилась для многих народов не только связующим звеном, но и тем вызовом, который способствовал осознанию и формированию их самобытных качеств. Осваивая различные территории, расширяя пространство своего мира, эти цивилизации способствовали распространению различных инноваций в пространстве Евразии, внося свой вклад в историю и культуру её народов. В тенгрианской цивилизации была сформирована и своя особая система экономических отношений, объединяющая кочевое скотоводство и экономические ресурсы оседлого земледельческого и городского хозяйства. На основе этого разделения в рамках одной цивилизации стала возможностью интеграция двух экономических отношений, в основе которой – принцип общественного разделения труда. Взаимодействие мира кочевья и мира оседлости в рамках единой цивилизации выработало и особый тип социальной стратификации, в которой важнейшую роль играет группа обожествленных героев, устанавливающий и аккумулирующий эти контакты. Великий поэт Юсуф Баласагун так пишет об землепашце:

*«Нас кормит землепашцев честный труд,
Хоть это бедный и безвестный люд».*

В древнетюркской племенной (корпоративной) общине преобладала система дуализма, когда общественное производство с одной стороны характеризовалось общим (общинным, родовым) владением пастбищной территорией (основным условием для скотоводства) и водными источниками, с другой – частной собственностью семьи на скот (основное средство производства) и другое имущество. Однако, удельные правители зачастую присваивали право распоряжаться общинными пастбищными угодьями по своему личному усмотрению, без согласования с другими членами общины. О существующей системе дуализма в тюркских государствах повествует в своей поэме Юсуф Баласагуни, указывая в своем произведении о том, что кочевые и полукочевые скотоводы не имеют в собственности недвижимое имущество, т.е. землю, хотя имеют в частной собственности многочисленные стада различных видов домашних животных.

А труд ремесленника в раннем средневековье в тюркском обществе считался незаменимым и самым искусным. Оценивая достаточно высокую степень специализации в данной сфере материального производства, Юсуф Баласагун восклицает:

*«Пусть славится ремесленный народ!
Богатство он руками создает».*

Симбиоз кочевого населения и оседлой части тюрков находил свое выражение в устном народном творчестве интересным образом: появился некто обожествленный Воин в нескольких ипостасях: как Воин-освободитель, Воин-Музыкант и Воин-охотник. «Не случайно поэтому, образы Воина-Музыканта, а также описания средств передвижения присутствуют абсолютно во всех артефактах культуры – в древнейших наскальных изображениях и других видах изобразительного искусства, образцах письменности, фольклоре, поэтическом, музыкальном творчестве и др.» [6, С.68].

В истории тюрков наблюдались периоды, когда «взаимодействие» с иными культурами и мирами приводило к значительному урону и даже потере национального колорита, приводящим, казалось бы, к потере самобытности и распаду всей тюркской цивилизации. Но проходит время, и тюркская цивилизация вновь и вновь концентрируется и самовозрождается, т.е. несмотря на периоды забвения и религии, и письменности, и языка, и культуры, все же на глубинном подсознательном уровне тюркский народ сохранил представление о стабильности мира, всего мироздания и об открытости пространства у кочевничества быта против замкнутого пространства при оседлом образе жизни. На глубинном уровне сохранились и общекультурные, и психологические связи между всеми тюркоязычными народами. И эту внутреннюю идею древней книги «Кутадгу билик» раскрывается в работе отечественных культурологов [7, С. 174].

Чрезвычайно высокая оценка тюркской цивилизации в Евразии связана с взаимодействием обоих составляющих, которое еще с эпохи неолита проявлялось через взаимодействие племен и их культурных традиций, увеличение численности тюркского населения, диффузию производственных навыков. И даже тогда, когда в отдельных частях тюркского мира, там, где исторически доминировал кочевничество, происходит полный переход к оседлости, наблюдается устойчивое сохранение духовного субстрата кочевничества, обеспечивающего эволюционное развитие общества. Однако на сегодняшний момент важен именно тот исторический урок кочевничества-тенгрианской цивилизации, которая смогла объединить большую часть Евразии, продемонстрировав тем самым основы для осмысления «Большой Евразии».

Таким образом, древний тюркский мир создал для себя оригинальную цивилизацию на основе гармонии, науки о Вселенной и познания человеческой сути, в соответствии с которыми строил и собственные законы. В отличие от многих оседлых «интровертных» цивилизаций, тенгрианская цивилизация экстравертна, для нее характерен широкий охват предметов мысли как в пространстве горизонтали, так и вертикали. Этому способствовали, с одной стороны, разнообразные миграционные процессы, а, с другой, космоцентрическое представление мира. Если говорить об энергетике всех этих кочевнических цивилизаций, то она заряжается от внешнего мира и фокусируется на всю Евразию.

Литература

1. Баласагун Юсуф. Благодатное знание. – М. 1983, – 197с.
2. Кычанов Е.И. Кочевые государства от гуннов до маньчжуров. – М.: Издательская фирма «Восточная литература» РАН, 1997. – 319 с.

3. Кадырбаев А.Ш. Тюрки и иранцы в Китае и Центральной Азии XIII–XIV вв. – А.-А.: Гылым, 1990. – 160 с.
4. С.Г. Кляшторный, Т.И. Султанов. Казахстан. Летопись трёх тысячелетий. –А-А: «Рауан». 1992. 378 с
5. Романчук А. А. 2024. Проникновение гаплогруппы R1b-V88 Y-хромосомы в Африке: историко-археологический контекст. – Кишинев: Стратум плюс. С 54
6. Аязбекова С.Ш. Картина мира этноса: Коркут-ата и философия музыки казахов. – Алматы, 1999. – 221 с.
7. Плетнева С.А. Закономерности развития кочевнических обществ в эпоху Средневековья // Вопросы истории, № 6. – Москва, 1981. – С. 50-63.
8. Аязбекова С.Ш, Аязбеков С.А. Тюркская цивилизация: теоретический и исторический контекст\ журнал «Тюркский альманах» - Астана, 2014 – С 176-179

Philosophical sciences

PHILOSOPHICAL PROBLEMS OF VIRTUAL REALITY

Khairullayeva Venera

Candidate of Philosophical Sciences, PhD, Associate Professor of Kazakh Ablai khan University of International Relations and World Languages

Kurbanbek Arailym

2nd year Master's degree student of Kazakh Ablai khan University of International Relations and World Languages

Abstract

Virtual reality (VR) has emerged as a transformative technology that challenges our conventional understanding of reality, identity, ethics, and consciousness. This article explores the philosophical issues raised by VR, examining how it blurs the boundaries between the physical and the virtual, and poses fundamental questions about human existence. First, it delves into the question of what is real?, considering how VR complicates traditional epistemological distinctions between reality and simulation. It then explores the concept of personal identity in virtual worlds, where individuals can assume multiple, radically different personas, complicating traditional notions of selfhood. The article further addresses ethical concerns, such as the moral status of virtual actions and the potential for exploitation in virtual economies and social spaces. It also examines the nature of consciousness in virtual environments, raising the possibility of consciousness extending beyond the physical brain into virtual realms. The article concludes with a discussion on the impact of VR on social interaction, human flourishing, and the potential for both positive and negative outcomes. By considering VR as both a philosophical and technological frontier, the article emphasizes the need for thoughtful reflection on how these virtual environments shape and redefine human experience in a rapidly evolving digital world.

Keywords: virtual reality, reality and simulation, personal identity, ethics of virtual reality, consciousness in VR, digital identity, moral status of virtual actions, VR and consciousness, digital economy and exploitation

Introduction

Virtual reality (VR) has emerged as one of the most transformative technologies of the 21st century. Once a futuristic concept confined to science fiction, VR is now a rapidly growing field influencing sectors ranging from entertainment to healthcare, education, and even social interaction. As VR technology becomes increasingly sophisticated, it not only challenges the boundaries of what is possible technologically but also raises profound philosophical questions about the nature of reality, identity, consciousness, ethics, and human experience. In this article, we will explore the philosophical problems that VR presents, focusing on how these issues challenge our understanding of the world and our place within it[1].

At the heart of the philosophical inquiry into VR lies the age-old question: What is real? For centuries, philosophers have questioned the nature of reality, with thinkers like Plato, Descartes, and Kant offering varying perspectives. In the context of VR, this question becomes especially pressing.

The experience of virtual environments, despite being entirely simulated by computers, can feel incredibly real. Through the use of immersive headsets, haptic feedback, and high-quality graphics, VR has the capacity to create sensory experiences that mimic the real world so effectively that they can trick the brain into believing in the authenticity of these experiences. In many ways, VR challenges the traditional understanding of reality as something strictly grounded in physical, external existence. René Descartes' philosophical skepticism is often invoked in discussions of VR. Descartes famously posited that we can doubt the existence of the physical world, suggesting that an "evil demon" could be deceiving us into believing in a reality that doesn't exist. In this context, VR is a modern metaphor for Descartes' skeptical challenge[2]. If a virtual world can be made to feel as real as the physical world, can we ever be certain of the reality of the world around us?

The existence of VR thus raises a deeper epistemological question: Can we trust our perceptions of the world? In the past, reality was generally thought to be whatever is external and independent of our

minds. But in VR, reality becomes something that can be constructed, altered, and experienced entirely within the confines of our minds, making the distinction between the "real" and the "virtual" more difficult to maintain.

Jean Baudrillard's theory of simulacra and simulation provides an insightful framework for understanding VR's challenge to the notion of reality. Baudrillard argued that in a postmodern world, representations (such as media, advertisements, and, in this case, virtual environments) no longer simply reflect reality—they begin to replace it entirely. In VR, we are confronted with the experience of hyper-real environments—virtual worlds that are more "real" in some ways than the real world itself, simply because they are designed to be free from the chaos and unpredictability of reality[3].

This leads to an unsettling question: If VR offers a more controlled, predictable, and customizable experience, does it become a more "real" world? And if the virtual is indistinguishable from the real in sensory experience, does it have the same claim to reality?

Main body

The question of personal identity is one of the most significant philosophical issues raised by VR. In the real world, personal identity is traditionally understood as the continuity of the self over time. Philosophers like John Locke have argued that identity is primarily a function of psychological continuity—specifically, the continuity of memory and consciousness. According to this view, as long as a person maintains a sense of self through memory and self-awareness, they are the same individual, regardless of physical changes. In VR, however, identity can be fluid. Users can create avatars that represent them in the virtual world, and these avatars need not resemble their physical bodies in any way. A person might experience themselves as a giant dragon, a robot, or even a completely different human being. This creates a tension between the continuity of the self and the flexibility of identity in virtual spaces[4].

If someone spends significant time in a VR environment with a radically different avatar, the question arises: Is the person the same in both the virtual and physical worlds? This becomes especially complicated if the virtual world allows for the construction of multiple identities. Locke's theory of identity based on psychological continuity would struggle to account for these kinds of transformations, where the "self" in the virtual world could radically differ from the "self" in the physical world.

Philosophers like Andy Clark and David Chalmers have proposed that our sense of self extends beyond our physical bodies to include the tools and environments we interact with. If we accept this view, then avatars in VR could be seen as extensions of the self, suggesting that an individual's identity is not bound to their physical form but can encompass their virtual persona. In this sense, VR avatars might not just represent individuals—they could, in some ways, become a part of their identity[5].

However, this raises another question: How do we understand the authenticity of a self that is fragmented across multiple platforms? In VR, individuals may live out multiple aspects of their identity in different virtual spaces—an issue that has significant implications for how we conceive of personal identity in the digital age.

The development of VR technologies also brings to the forefront important ethical considerations. On one hand, VR has the potential to enrich human life—by offering new avenues for creativity, education, and communication. On the other hand, it introduces new ethical dilemmas that challenge our understanding of moral behavior and responsibility. One of the most pressing ethical issues in VR is the moral status of actions performed within virtual environments. In VR, users can engage in behaviors—such as violence, theft, or deception—that would be considered morally wrong in the real world. Yet, because these actions take place in a simulated world, they do not have the same immediate physical consequences. From a consequentialist perspective, one could argue that actions in VR are morally neutral, as they do not cause harm in the physical world[6]. However, deontologists might contend that there is an inherent moral value in the actions themselves, regardless of their consequences. If a person kills another player in a VR game, is that morally equivalent to committing murder in the real world, or is it less significant because the victim is not real?

The Psychological Impact of Virtual Actions

Another concern is the psychological impact that VR can have on users. While VR simulations may not involve physical harm, they can still produce emotional and psychological effects. For example, exposure to violent VR content could desensitize individuals to real-world violence, or VR harassment could cause real emotional distress, even though it is taking place in a virtual world. In this regard, the ethical questions surrounding VR extend beyond actions performed in the virtual space to the broader consequences these actions have on the individual's behavior, attitudes, and perceptions in the real world.

VR also introduces new opportunities for exploitation, particularly in virtual economies. Many VR environments include virtual currencies and marketplaces where users can buy, sell, and trade virtual goods. These economies may operate within the framework of the game or VR platform, but they can also create systems of inequality or exploitation. Just as the internet has enabled various forms of online exploitation (such as the sale of data or the spread of misinformation), VR might similarly facilitate new kinds of manipulation, fraud, or coercion. Another form of exploitation arises in VR social spaces. The anonymity and immersive nature of VR may encourage harmful behaviors like harassment, cyberbullying, and sexual misconduct. The presence of virtual spaces where users can engage with others without the constraints of the physical world complicates the application of ethical principles that would apply to real-world interactions.

Methods and discussion

This article primarily adopts a philosophical and theoretical approach to the analysis of virtual reality (VR) and its implications. The methodology involves:

Literature Review and Conceptual Analysis:

A comprehensive review of existing philosophical literature on the nature of reality, personal identity, ethics, and consciousness was conducted. Key texts from both classic and contemporary philosophers—such as Descartes' *Meditations*, John Locke's theory of personal identity, Baudrillard's *Simulacra and Simulation*, and Heidegger's critique of technology—served as the foundational philosophical framework for examining VR. Additionally, recent academic discussions on the ethics of technology and VR were explored, drawing from interdisciplinary sources, including ethics in virtual environments, psychology, and cognitive science[7].

Comparative Analysis: The paper compares and contrasts traditional philosophical questions with the new challenges posed by VR technology. By using VR as a lens through which to reconsider age-old philosophical problems (e.g., the nature of reality, personal identity, and consciousness), this article aims to synthesize insights from both philosophy and VR studies to generate new perspectives on these issues.

Thought Experiments and Speculative Scenarios: Given the speculative nature of VR and its ongoing technological development, the article incorporates thought experiments and hypothetical scenarios to explore philosophical dilemmas. For example, the question of whether an AI in a VR environment could develop consciousness, or whether actions in a virtual world have moral weight, is approached through conceptual reasoning and philosophical exploration[8].

Case Studies and Examples: While primarily theoretical, the discussion occasionally draws from real-world VR applications to ground the abstract philosophical questions. Examples include VR gaming, social VR platforms like Second Life or VRChat, and the use of VR in education or psychotherapy. These case studies illustrate the practical implications of philosophical issues like digital identity, moral behavior in VR, and the ethics of virtual spaces.

Discussion

The rapid development of VR technology presents both exciting opportunities and significant philosophical challenges. In this section, we reflect on the implications of the philosophical problems of VR raised in the article, providing a deeper analysis of how VR might shape future human experience and philosophical discourse.

1. The Nature of Reality: Beyond the Physical World?

The question "What is real?" becomes even more complex in the context of VR. VR offers immersive, sensory experiences that can be indistinguishable from the physical world, yet it remains fundamentally a simulation, dependent on code, algorithms, and computer-generated environments. In traditional epistemology, reality was considered to be external to the mind, something we perceive through our senses and interact with in physical space. However, VR challenges this assumption by showing that the mind can be tricked into believing in the authenticity of a virtual world.

Philosophers like Jean Baudrillard argue that we live in an era of "hyperreality," where simulations (such as those created by VR) become more real to us than the real world. Baudrillard's critique suggests that VR, far from being a mere imitation of reality, could eventually replace it as the dominant form of experience. In this sense, VR does not simply replicate reality but creates an alternate form of reality that competes with and perhaps even surpasses the physical one in terms of control, accessibility, and richness of experience.

Discussion Point: The implications of this hyperreal experience raise questions about how we should understand reality in the digital age. If a virtual world offers the same sensory satisfaction as the physical world, what criteria should we use to define "authenticity" and "reality"? Should virtual worlds be seen

as legitimate realities in their own right, or do they remain inherently inferior imitations of physical existence?

Personal Identity: The Fluidity of the Self in Virtual Worlds

Personal identity, traditionally understood as the continuity of the self through time, faces a profound challenge in virtual environments. In VR, users can assume avatars that bear little or no resemblance to their physical selves, effectively allowing them to inhabit multiple identities simultaneously. The flexibility of virtual avatars raises the question: Can identity still be understood as continuous if it can be radically altered at will? John Locke's theory of personal identity is based on psychological continuity—memory, self-awareness, and consciousness connect a person over time. In VR, however, avatars may be disconnected from the psychological and physical continuity of the user. A person can choose to take on an entirely different persona, potentially with a different gender, age, race, or social status. Does this mean their identity is fragmented, or can the psychological continuity Locke describes transcend the virtual body?

Further complicating this issue, VR allows individuals to experience an "extended self" through their avatars and virtual actions. The extended mind hypothesis, proposed by philosophers like Andy Clark and David Chalmers, argues that the mind is not confined to the brain but extends to tools and environments. This suggests that if avatars and virtual worlds are integrated into our cognitive processes, they might become part of our broader sense of self. The question then becomes: If an avatar becomes an extension of the self, does it carry the same moral and ethical responsibilities as the user's physical body?

As we engage with virtual identities and environments, we must reconsider whether personal identity is an inherently physical, psychological, or digital construct. If avatars can become integral parts of the self, how should we interpret the ethical implications of virtual actions, such as harassment or aggression, performed through these avatars?

Conclusion

Virtual reality (VR) represents not just a technological innovation but a profound challenge to our traditional understanding of reality, identity, ethics, and human experience. As VR technology continues to evolve and becomes increasingly embedded in our lives, it prompts us to reexamine some of the most fundamental questions in philosophy: What is real? What does it mean to be human? How should we interact with each other and our digital environments?

The philosophical problems presented by VR—such as the nature of reality, the fluidity of personal identity, the morality of virtual actions, and the potential for virtual consciousness—force us to reconsider the very foundations of existence and human interaction. VR blurs the lines between the physical and the virtual, opening new possibilities for creative expression, social connection, and self-exploration. However, it also raises serious ethical and existential concerns, including issues of authenticity, moral responsibility, and the potential for escapism.

In examining the philosophical implications of VR, we find both risks and opportunities. On one hand, VR offers profound potential for human flourishing. It can serve as a powerful tool for education, therapy, and creative expression, allowing individuals to transcend the limitations of the physical world and explore new realms of possibility. On the other hand, VR poses risks of alienation, addiction, and social isolation, particularly as individuals may begin to prefer virtual worlds over real-world interactions. The philosophical challenge is to navigate these risks while embracing the benefits of VR, ensuring that the technology is used to enhance human well-being rather than diminish it.

References

1. Baudrillard, J. (1994). *Simulacra and Simulation*. University of Michigan Press.
2. Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis*, 58(1), 7-19.
3. Descartes, R. (1641). *Meditations on First Philosophy*.
4. Heidegger, M. (1977). *The Question Concerning Technology and Other Essays*. Harper & Row.
5. Locke, J. (1690). *An Essay Concerning Human Understanding*.
6. Bainbridge, W. S. (2007). The Scientific Research Potential of Virtual Worlds. *Science*, 317(5837), 472-476.
7. Brey, P. (2007). The Ethics of Virtual Reality. *The Atlantic Philosophy Review*, 8(2), 46-58.
8. Harris, C. (2019). *Ethics in Virtual Reality: Morality, Deception, and Disembodiment*. Routledge.

Technical sciences

MEDIA DESIGN AND BOOKS: CONNECTION AND DEVELOPMENT PERSPECTIVES

Dastan Kuandyk

KazNU (Kazakh National University), Faculty of Journalism

Abstract

This article explores the connection between media design and books. It discusses how media design is applied in book design, enhancing aspects such as typography, graphics and illustrations, text layout, and modern formats. The article examines the influence of media design on the visual consumption of books, including digital books and mobile formats, as well as the development of interactive books. Additionally, it highlights the future directions for media design in the book industry, including the use of virtual and augmented reality, interactive learning tools, and digital printing technologies. The article emphasizes the growing relationship between book design and media design and their combined potential for future development.

Keywords: media design, book design, typography, graphics, illustrations, digital books, e-books, interactive books, mobile formats, virtual reality, augmented reality, digital printing technologies, visual consumption of books.

Media design is an art field focused on presenting information visually, considering both its aesthetic and functional aspects. This term has gained significant popularity in recent years and is applied across a wide range of fields, from traditional print design to digital media, the internet, and mobile applications. Books, in turn, remain a crucial format for delivering information. This article discusses the connection between media design and books and its role in this field.

The Connection Between Media Design and Books

The connection between media design and book design is very close. Media design is primarily used to enhance the aesthetic appearance and internal structure of books. Both fields focus on structuring visual information and presenting it in a way that is convenient for the reader or user. The connection between media design and books manifests in the following key aspects:

Typography and Fonts: The font, size, line spacing, and number of lines in a book are all the result of typographic design. Media designers work with typography to ensure the harmonious integration of text and visuals, making it easy to read.

Graphics and Illustrations: Illustrations, images, and graphic elements in a book are part of media design. These elements reveal the content of the book and help capture the reader's attention.

Layout and Text Arrangement: The structure of the book and the arrangement of pages are also influenced by media design. Designers focus on the layout of text, the division of chapters and paragraphs, and the integration of diagrams and tables to improve the reading experience.

Modern Book Formats: The rise of e-books and audiobooks has opened up new possibilities for media design. The process of producing books in digital formats differs significantly from traditional print design, but the role of media design remains essential. In e-books, the arrangement of text on the screen and the creation of a user-friendly interface are key tasks of media design.

The Influence of Media Design on the Visual Consumption of Books

In recent years, the boundaries between book design and media design have become increasingly blurred. While books used to be created with traditional printing methods and focused primarily on typography and illustrations, media design now plays a significant role in the visual consumption experience of print books as well as digital and e-books.

Digital Book Versions: Media design is widely used in the creation of digital books and applications. The interface of e-books, their readability, text size, and color – all of these aspects are the result of media designers' work. For example, to make reading easier on screens, text colors and fonts must be carefully coordinated.

Mobile Formats of Books: The reading experience is changing with mobile apps and reading platforms. Media designers develop new solutions and elements to make the interface of books more accessible and convenient for readers.

Interactive Books: In the digital world, media design is not limited to the text of books. Today, interactive and multimedia books are becoming more widespread. These books may include videos, animations, games, and other elements. Such books offer readers the opportunity to engage with not only the text but also various media tools.

Future Development Directions of Media Design in Books

The connection between books and media design will continue to deepen in the future. With the advancement of digital technologies, book design will acquire new possibilities. These include:

Virtual and Augmented Reality (VR/AR) Technologies: New media design technologies provide opportunities to present books from a fresh perspective. The integration of virtual or augmented reality elements into books can offer readers a deeper and more immersive experience.

Interactive Learning Tools: Media design allows for the creation of e-books as effective tools for education and learning. Interactive elements and multimedia resources could be added to make the learning process more engaging for students.

Digital Printing and 3D Design: The new 3D formats of books, the physical structure of book pages, and the visual experience of reading will reach a new level when combined with the digital age. Digital printing technologies will transform book design and offer new ways to update it.

Conclusion: *The connection between media design and books has been a creative and technological process that has developed over centuries. Modern media design not only influences the artistic side of books but also significantly improves their connection with readers. Contemporary e-books and interactive books open up new opportunities for the future of media design. The visual and functional features of books offer opportunities to elevate creativity in this field to new heights.*

References

1. Dickson, P. (2016). *Media Design: Theory and Practice*. Almaty: Book House.
2. Jumabayev, T. (2019). *History of Book Design and Graphic Arts*. Almaty: Rawan.
3. Mukhamendjanov, E. (2020). *Digital Books and Media Design: New Opportunities and Development Trends*. *New Media and Design Journal*, No. 2, 34-42 p.
4. Adilbekova, G. (2021). *The Intersection of Media Design and Print Design*. Almaty: Science.
5. Altybaeva, R. (2022). *Changes in Book Design in the Digital Age*. *Contemporary Design*, 12(3), 58-63 p.
6. Sharipova, G. (2018). *Graphic Design and Book Arts: Theory and Practice*. Almaty: Kazakh University.
7. Bekenova, N. (2020). *The Role and Future of Media Design in Book Publishing*. *Culture and Arts Journal*, No. 1, 11-17 p.
8. Ermekova, S. (2019). *E-books and Media Design: New Trends in Education*. *Contemporary Education*, 7(2), 45-50 p.

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INTERACTION OF USER AND UX-DESIGN: NEW STANDARTS FOR SOFTWARE*Popko V.S.**Lets Y.M.**Lishchyna N.M.**Lutsk national technical university**Lutsk, Ukraine*

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ВЗАЄМОДІЯ КОРИСТУВАЧА ТА UX-ДИЗАЙН: НОВІ СТАНДАРТИ ДЛЯ ПРОГРАМНОГО ЗАБЕЗПЕЧЕННЯ*Попко В.С.**Лець Є.М.**Ліщина Н.М.**Луцький національний технічний університет,**м. Луцьк, Україна.***Abstract**

The research is dedicated to analysis of development User Interface at web-development and another types of software. The meaning of User Interface and User Experience is examined. Special attention is paid to evolution of development user interfaces and standards, which are using developers of software. Also the teamwork for development the User Interface for software is examined.

Анотація

Дослідження присвячене аналізу розробки користувацького інтерфейсу у веб-розробці та не тільки. Розглянуто поняття User Interface та User Experience. Особливу увагу було приділено еволюції у розробці інтерфейсів, стандартам, якими зараз користуються розробники програмного забезпечення. Також було приділено увагу командній роботі у розробці інтерфейсу для програмного забезпечення.

Абсолютно кожне програмне забезпечення має хоча б якийсь інтерфейс. Це може бути наприклад як консольний рядок, так і вікно з багатьма кнопками. Але для того, щоб в кінцевому результаті вийшов зручний інтерфейс, розробникам треба ой як постаратись, щоб його правильно створити. Тому у даній роботі розглянеться, чому User experience та user interface займають для розробників напевно ледь не найважливіший етап життєвого циклу проекту.

User interface – спосіб взаємодії між пристроєм та людиною. Це може включати в себе вікно на робочому столі, клавіатуру, мишку або ще багато подібних пристроїв. Також UI може бути вікном браузера, чи стороннього програмного забезпечення взагалі, яке взаємодіє з користувачем за допомогою шрифтів, іконок, кнопок, анімацій та звуків [1].

User experience можна вважати те, чого очікує кінцевий користувач. А очікує він здебільшого зручного, не навантаженого лишніми елементами інтерфейсу, який буде працювати швидко, та матиме приємне оформлення.

Хоча ці два словосполучення дехто вважає як синоніми, насправді це не так. User interface вважається просто взаємодією, то user experience охоплює більш широкий спектр, ніж просто інтерфейс програмного забезпечення. User experience включає все, що робить кінцевий користувач, пов'язаний з продуктом, включно з тим, як це вписується в загальний робочий процес, а також кроки до та після фактичного використання продукту. Крім того, user experience охоплює, як ці взаємодії змінюватимуться з часом у міру того, як змінюється використання клієнтом, а також продукт і компанія [2].

Розглянемо коротко, як змінювався інтерфейс для кінцевого користувача. Інтерфейси найперших комп'ютерів залишаються для теперішнього покоління досить незрозумілими і важкими. Воно й не дивно, оскільки комп'ютери тоді не мали тоді всю ту периферію, якими ми користуємось зараз. Тоді взаємодія між людиною та комп'ютером відбувалась за рахунок багатьох кнопок і також великою кількістю лампочок на самому пристрої.

Але все це змінилось, як тільки появились перші мікропроцесори. Саме тоді, вже в той час комп'ютери почали приймати вже такий вигляд, який ми маємо на теперішній момент (Тобто весь пристрій став займати не цілу кімнату, або навіть і цілу будівлю, а вже міг мати такі габарити, які людина вже в спромозі підняти чи підсунути). Вже в той момент набирала популярності операційна система MS-DOS. Її інтерфейс для нас є й досі незрозумілим і примітивним, але вже середньостатистичний користувач був в спромозі користуватись вже персональним комп'ютером. А саме її інтерфейсом був командною панеллю, де користувач вводив місцезнаходження того чи іншого файлу, і потім вводив іншу команду, в залежності від того, що користувач хоче зробити з цим файлом (наприклад, відкрити, видалити чи скопіювати).

Але з виходом персональних комп'ютерів Macintosh від Apple, інтерфейс персональних комп'ютерів вже отримує звичний нам інтерфейс, оскільки такий пристрій базувався вже на графічному інтерфейсі. Замість командного рядка можна використовувати мишу, що дозволяє користувачеві краще взаємодіяти з пристроєм. У 1985 році компанія Microsoft розробляє операційну систему Windows, який базується на системі MS-DOS. По факту, користувач ще зобов'язаний користуватись MS-DOS, але вже ввівши шлях до Windows, користувач вже може взаємодіяти з комп'ютером як і у випадку з MacOS, що дозволить не володіти технікою конкретно від Apple, і одночасно, користуватись пристроєм, як і на Macintosh. Вже з виходу Windows 95 необхідність у MS-DOS вже відпадає, оскільки це вже самостійна операційна система, а не його оболонка. І вже з того моменту, революційних змін, як таких не відбулось. Відбувалось лише покращення, що наприклад вікна тепер мають приємніший вигляд, а не це просто сіре вікно з піксельними іконками. Тепер вони мають свою форму, тінь, анімацію, що в кінцевому результаті, користувач це у будь-якому випадку оцінить.

Але ще не варто забувати про те, що на даний момент практично кожна людина користується смартфонами. У даних пристроїв передбачений більш компактний інтерфейс, який на одному місці містить в рази менше елементів, ніж на персональному комп'ютері. Тому розробники, під час розробки програмного забезпечення намагаються адаптувати інтерфейс під такі пристрої, оскільки використання інтерфейсу для персонального комп'ютера буде незручним.

Оскільки вже було розглянуто інтерфейси для мобільних пристроїв, варто зазначити, що розробники в першу чергу намагаються адаптувати інтерфейс вже саме під такі пристрої, оскільки ними користуються в рази більше людей, так як не кожна людина при собі має персональний комп'ютер.

Також однією необхідністю є темний, або нічний режим. Багато хто використовує пристрої вже у нічну пору. Використання звичайного режиму, який має дуже багато світлих елементів у таку пору дуже сильно напружує зір. Тому, щоб уникнути надзвичайної напруги, розробники намагаються розробити такий режим.

Більшість розробників використовують для розробки інтерфейсу стандарт WCAG. Це список коротких інструкцій, який дозволяє зробити вміст веб-сайтів більш доступним для людей з обмеженими можливостями, а також для пристроїв, які також мають вже технічні обмеження (наприклад смартфони, планшети) [3].

Авжеж, Front-end розробники не займаються розробкою інтерфейсу користувача з нуля. Цим повинні займатись розробники UI/UX. У їхні обов'язки не входить написання коду, а створення інтерфейсу на якомусь графічному редакторі (Наприклад Figma, Adobe XD, Adobe photoshop). Це важливо в першу чергу для Front-end розробника, оскільки для нього це значна економія часу, та й на теперішній час він не повинен знати всі стандарти створення інтерфейсу, тобто він його просто копіює, перетворюючи його на програмний код. У другу чергу, створення макету дозволить точніше оцінити, чи вірно було розписано інтерфейс на клієнті. На теперішній момент, це дуже важливо, оскільки неправильне розміщення якогось елементу значно руйнує всі враження від програмного забезпечення.

Враховуючи вище написані всі факти, можна зробити висновок, що прогрес не стоїть на місці, і кожної миті може розробитись революційний метод розробки UI. Розробкою інтерфейсу займається на теперішній момент не одна людина, здебільшого це ціла команда, яка має спільну мету – створення інтерфейсу, який буде в першу чергу зрозумілий незнайомій людині, а вже потім, розробникам.

Список використаних джерел

1. What is a User Interface (UI). Techtarget.com.
URL: <https://www.techtarget.com/searchapparchitecture/definition/user-interface-UI> (date of access: 30.11.2024).
2. What is User Experience? | Definition and overview. productplan.com.
URL: <https://www.productplan.com/glossary/user-experience/> (date of access: 30.11.2024).
3. Contributors to Wikimedia projects. Web Content Accessibility Guidelines - Wikipedia. Wikipedia, the free encyclopedia.
URL: https://en.wikipedia.org/wiki/Web_Content_Accessibility_Guidelines (date of access: 02.12.2024).

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THE FEATURES OF JWT, OR HOW TO PROVIDE PROTECTION OF USER FROM DATA LEAK*Popko V.S.**Lets Y.M.**Lishchyna N.M.**Lutsk national technical university**Lutsk, Ukraine*

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ОСОБЛИВОСТІ JWT, АБО ЯК ЗАБЕЗПЕЧИТИ ЗАХИСТ КОРИСТУВАЧА ВІД ЗЛИВУ ДАНИХ*Попко В.С.**Лець Є.М.**Ліщина Н.М.**Луцький національний технічний університет,**м. Луцьк, Україна.***Abstract**

The research is devoted to analysis of JWT, its general features at web-platforms and the others. The structure of JWT, all its advantages and disadvantages happens during the development with using JWT and the places, where it can be used are considered.

Анотація

Дослідження присвячене аналізу JWT, його основних властивостей на веб-платформах і не тільки. У роботі розглядаються структура JWT, всі переваги та недоліки, які можуть зустрітись під час роботи над проектом з використанням JWT, та де конкретно даний функціонал може бути застосований.

Безпека даних у будь-якому просторі є дуже важливою у наш час. Вона має напевно найперший пріоритет у розробці програмного забезпечення, оскільки не кожен захоче використовувати даний ресурс, який зливає приватні дані у публічний простір. Тому, у даній роботі буде розглянуто детально JWT технологію передачі даних.

JSON Web Token (JWT) – компактний і самодостатній спосіб передачі інформації як JSON об'єкт. Дана інформація може бути перевірена та доведена, бо підписана цифровим підписом. JWT використовується насамперед для аутентифікації та авторизації користувачів, надаючи простий спосіб передачі даних без необхідності зберігати сесію на сервері.

Структура JWT токена досить проста. Вона складається з 3 частин:

- заголовок (Header), який містить дві частини: тип токена, яким є JWT, і алгоритму підписання, що використовується, наприклад HS256 або RSA;*
- основної частини (Payload), де розміщується зміст тієї інформації, яку ввів користувач;*
- підпису.*

Детально розглянемо спочатку основну частину токена. Тут дана інформація розглядається у вигляді заявок. Заявки поділяються на 3 частини:

- зареєстровані, які не є обов'язковими, але рекомендуються для надання набору сумісних заявок. Деякі з них: exp, sub, aud та інші. Всі ті заявки повинні складатись лише з 3 символів, оскільки JWT має бути компактным;*
- публічні можуть бути визначені за бажанням тими, хто безпосередньо використовує JWT. Аби уникнути всяких накладанням назв змінних, вони повинні бути визначені згідно реєстру веб-токенів IANA JSON або бути визначеними як URI, що містить стійкий до зіткнень простір імен;*

- приватні заявки, створені для обміну інформацією між сторонами, які домовляються про їх використання та не є ні зареєстрованим, ні публічними заявами.*

Основна частина токена ніяк не шифрується, та й не мають ніякої секретної інформації. І вже безпосередньо на клієнтській частині вони можуть легко розшифруватись.

Але щоб точно переконатись, чи це дійсно не стороння людина, використовується третій фрагмент токена, а саме підпис. Саме тут розміщені різні паролі та інша інформація, які не повинні вилетіти з серверу.

Сам приклад робочого JWT токена показано на рисунку 1. Будь-який токен можна розшифрувати на сайті <https://jwt.io>,

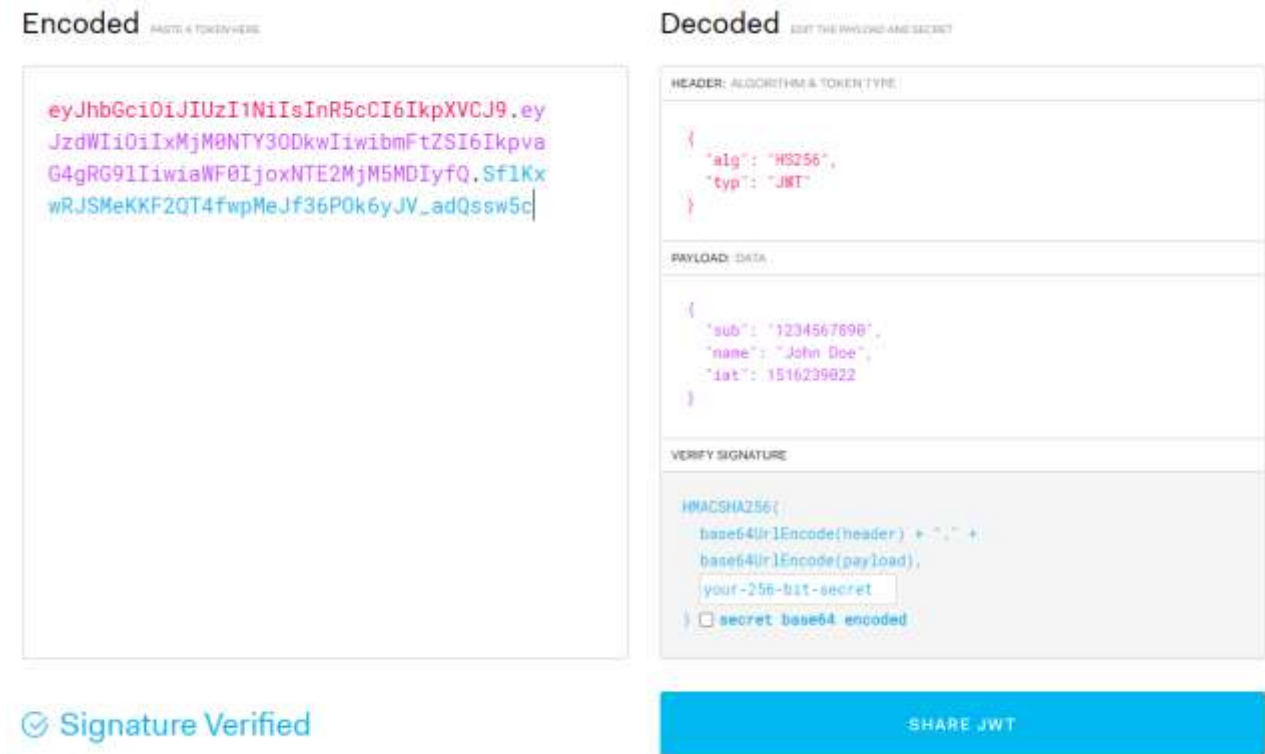


Рисунок 1 – Приклад розшифрованого токена

Зліва у нас розташований зашифрований токен. Як можна побачити, перший елемент токена це в нас заголовок (колір даного елементу червоний), другий елемент – основна частина (даний елемент зафарбований фіолетовим), а третій – підпис (він синій)

Справа вже як видно міститься розшифрована інформація з даного токена, який подається у форматі JSON. У першому, як вже було розглянуто, описано алгоритм розшифрування токена і саме ідентифікація того, що це саме JWT.

У 2 вікні показується вся інформація, що не є прихована (тобто це може бути прізвище, ім'я, по-батькові і так далі).

А останнє вікно це вже йде безпосередньо підпис токена. Необхідно звернути увагу на те, що дана частина токена не розшифровується, і тим більше, не показується користувачеві наперед. Саме це дозволяє захистити користувача від несанкціонованих дій сторонніх людей.

Хоча дана технологія має свої переваги, у вигляді зручності розробки алгоритму авторизації та реєстрації користувача, вона має також і свої недоліки:

- розмір токена зазвичай має більший розмір, ніж решта cookie файлів, що може вплинути на швидкість завантаження і мережевий трафік;

- JWT не має вбудованого механізму відкликання, тому якщо токен вже спроектовано, він буде дійсним лише до закінчення терміну його дії;

- неправильна інтерпретація токена, що може міститись у JWT може призвести до витоку даних. Але це вже залежить як від розробника, який проектував алгоритм розшифрування токена, так і від користувача, якщо він введе не ту інформацію, яку необхідно.

Дану технологію найчастіше використовують у розробці веб-застосунків для аутентифікації та реєстрації користувачів, забезпечуючи зручний та безпечний спосіб передачі даних між клієнтом і сервером. Також його використовують у мобільних додатках, оскільки це забезпечує легку інтеграцію з серверними API.

Також JWT використовується в системах єдиного входу (SSO), що дозволяє користувачам аутентифікуватись один раз і отримати доступ до багатьох ресурсів без повторного входу.

Розглянувши всі основні аспекти роботи з JWT можна зробити висновок, що дана технологія є досить зручною як для розробника програмного забезпечення, через простоту

алгоритму, так і для користувача, оскільки при правильній інтерпретації витік даних не буде можливим. Було розглянуто саму структуру JWT, його переваги та недоліки.

Список використаних джерел

1. JWT.IO - JSON Web Tokens Introduction. JSON Web Tokens - jwt.io.
URL: <https://jwt.io/introduction/?form=MG0AV3> (date of access: 29.11.2024).
2. JSON Web Token (JWT). Internet Assigned Numbers Authority.
URL: <https://www.iana.org/assignments/jwt/jwt.xhtml> (date of access: 29.11.2024).

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INTEGRATION OF AWS INTO STREAMING WEB PLATFORMS

*Lets Y.M.
Popko V. S.
Povstyana Y. S.*

*Lutsk National Technical University,
Lutsk, Ukraine*

УДК 004.056.5

ІНТЕГРАЦІЯ AWS У СТРІМІНГОВИХ ВЕБ-ПЛАТФОРМАХ

*Лець Є.
Попко В.
Повстяна Ю.*

*Луцький національний технічний університет,
м. Луцьк, Україна*

Abstract

The research is dedicated to analyzing the potential of integrating AWS cloud services into streaming web platforms. The advantages of using AWS Media Services for streaming content, ensuring high video quality, and efficient resource management are examined. Special attention is paid to data protection mechanisms, service scaling, and cost optimization.

Анотація

Дослідження присвячене аналізу можливостей інтеграції хмарних сервісів AWS у стрімінгових веб-платформах. Розглянуто переваги використання AWS Media Services для потокової передачі контенту, забезпечення високої якості відео та ефективного управління ресурсами. Особливу увагу приділено механізмам захисту даних, масштабуванню сервісів і оптимізації витрат.

Розвиток стрімінгових сервісів вимагає застосування технологій, здатних забезпечити високу якість передачі контенту, масштабованість систем і надійний захист даних. В умовах збільшення обсягу відеоконтенту та чисельності користувачів, традиційні серверні рішення стають неефективними через обмеженість ресурсів та високі витрати. Хмарні сервіси AWS пропонують інструменти, які дозволяють вирішувати ці виклики, забезпечуючи безперебійну роботу стрімінгових платформ.

Завдання дослідження полягає у:

- аналізі сучасних тенденцій використання хмарних сервісів для стрімінгових платформ;*
- вивченні функціоналу AWS Media Services, зокрема Amazon Elastic Transcoder, AWS Elemental MediaLive, MediaConvert;*
- розробленні архітектури інтеграції AWS для стрімінгової платформи, орієнтованої на ефективність, масштабованість та захист даних;*
- оцінці впливу інтеграції AWS на якість платформи та витрати на її утримання.*

Хмарні сервіси AWS забезпечують стрімінгові платформи інструментами для обробки, зберігання і розповсюдження контенту. Основними перевагами є автоматичне збільшення або зменшення ресурсів залежно від навантаження, що дозволяє ефективно використовувати ресурси. Також у AWS присутня гнучкість, що підтримує різноманітні формати відео і аудіо, що робить платформу адаптованою до потреб користувачів. На останок AWS має високий рівень захищеного доступу до контенту за допомогою AWS Identity and Access Management (IAM) і AWS Key Management Service (KMS).

Інструменти AWS Media Services:

- Amazon Elastic Transcoder – використовується для кодування відео у формати, які підтримуються різними пристроями. Це забезпечує сумісність із широким спектром пристроїв, від смартфонів до телевізорів із великим екраном;*

– *AWS Elemental MediaLive* – він забезпечує реальний час потокової передачі контенту. Сервіс підтримує трансляції високої якості, що особливо важливо для спортивних подій чи інших масових заходів;

– *AWS Elemental MediaConvert* – він використовується для підготовки відеофайлів для відео-на-замовлення (VOD). Завдяки цьому сервісу можна досягти оптимального співвідношення між якістю відео та розміром файлу.

Безпека та захист контенту в AWS пропонує декілька рівнів захисту для стрімінгових платформ:

– використання *AWS CloudFront* дозволяє створювати захищені URL для перегляду контенту лише авторизованими користувачами;

– використання *AWS KMS* забезпечує шифрування даних на етапі зберігання та передачі;

– сервіси *AWS CloudWatch* та *AWS CloudTrail* надають інструменти для відстеження підозрілої активності та швидкого реагування на потенційні загрози.

AWS дозволяє автоматично масштабувати інфраструктуру залежно від кількості активних користувачів. Використання моделі оплати "pay-as-you-go" (оплата лише за використані ресурси) дозволяє знизити витрати порівняно з традиційними хостинговими рішеннями.

Розглянувши всі основні аспекти роботи з *AWS* можна сказати, що інтеграція хмарних сервісів *AWS* у стрімінгові веб-платформи значно підвищує їхню ефективність, масштабованість та рівень безпеки. *AWS Media Services* забезпечують гнучкість у роботі з різними форматами контенту, дозволяють реалізувати багаторівневий захист даних і оптимізувати витрати. Використання таких технологій створює конкурентну перевагу для сучасних стрімінгових платформ і відкриває нові можливості для їх розвитку.

Список використаних джерел

1. "AWS Media Services Overview." Amazon Web Services. URL: <https://aws.amazon.com/media-services/>. (date of access: 05.11.2024).

2. "Getting Started with AWS Elemental MediaConvert." Amazon Web Services. URL: <https://docs.aws.amazon.com/mediaconvert/latest/ug/what-is.html>. (date of access: 06.11.2024).

3. "OWASP Secure Coding Practices." Open Web Application Security Project (OWASP). URL: <https://owasp.org/>. (date of access: 06.11.2024).

4. "AWS Cloud Security." Amazon Web Services. URL: <https://aws.amazon.com/security/>. (date of access: 08.11.2024).

EFFICIENT AND ENVIRONMENTALLY FRIENDLY DRYING OF DISPERSED MATERIALS IN A SUSPENDED LAYER

Sazhin Victor

*Doctor of Technical Sciences, Distinguished Professor, Director of the Fund,
Russian investment and innovation Fund "Scientific Perspective",
Moscow, Russian Federation*

ЭФФЕКТИВНАЯ И ЭКОЛОГИЧЕСКИ БЕЗОПАСНАЯ СУШКА ДИСПЕРСНЫХ МАТЕРИАЛОВ В ВЗВЕШЕННОМ СЛОЕ

Сажин Виктор Борисович

*доктор технических наук, профессор, академик, директор Фонда,
Российский инвестиционно-инновационный Фонд «Научная Перспектива»,
г. Москва, Российская Федерация*

Abstract

Fulfilment of the UN 2030 Agenda for Sustainable Development commitments may contribute to increased tensions in various regions of the world. Refusal of financial assistance to Russia may disrupt the implementation of the UN 2030 Agenda. It is recommended to involve the Russian Engineering Academy as an executor and coordinator of work on the implementation of the UN 2030 Agenda in Russia in terms of minimizing industrial environmental damage. A system of measures is proposed to minimise heat and dust emissions during highly efficient drying of dispersed materials - the most environmentally unfavourable process in industry.

Аннотация

Выполнение обязательств Повестки ООН-2030 по устойчивому развитию может способствовать увеличению напряженности в различных регионах мира. Отказ от финансовой помощи России может сорвать выполнение Повестки ООН-2030. Рекомендовано привлечь Российскую инженерную академию в качестве исполнителя и координатора работ по выполнению Повестки ООН-2030 в России в части минимизации промышленного экоущерба. Предложена система мер по минимизации тепловых и пылевых выбросов при проведении высокоэффективной сушки дисперсных материалов – наиболее экологически неблагоприятного процесса в промышленности.

Keywords: *ecology, drying, particle, layer, fluidization, efficiency.*

Ключевые слова: *экология, сушка, частица, слой, псевдооживление, эффективность.*

Промышленное производство наносит серьёзный вред экологии [1] Страны мира (193 страны) поддержали Повестку ООН устойчивого развития до 2030 года, обязавшись применять самые решительные меры в части сохранения экологии и минимизации биоущерба. Представляется, что лишь кабинетный анализ ситуации позволяет рассчитывать на выполнение амбициозных планов. Парадигма современной техносферы заключается в «удовлетворении всё возрастающих потребностей человечества целесообразным способом». Существующие промышленные технологии и действующие производства создавались в традициях природоборчества (Иван Мичурин: «Мы не можем ждать милостей от природы. Взять их у нее – наша задача»). Требовать от промышленности одновременно высокой производительности и сохранения природы нелепо. Эволюция современной техносферы в природоподобную должна включать длительный переходный период, во время которого неизбежный техногенный биоущерб будет сопровождаться усилиями по минимизации вредных выбросов.

Концепция устойчивого развития (УР) базируется на принципах E-S-G: забота об окружающей среде (environment); социальная ответственность (social) и высокие стандарты корпоративного управления (governance) [2]. То есть УР – это комплекс мер, нацеленных на удовлетворение текущих потребностей человека при сохранении окружающей среды и

ресурсов, то есть без ущерба для возможности будущих поколений удовлетворять свои собственные потребности. Большинство государств мира (193 страны) заявило о поддержке Повестки ООН в сфере устойчивого развития до 2030 года и согласились приложить совместные усилия правительств, гражданского общества и бизнеса для реализации выдвинутых 17 глобальных ЦУР (целей устойчивого развития).

Собственно концепция устойчивого развития включает три сферы - экономическую, социальную и экологическую. Применительно к научно-техническому прогрессу часто ограничиваются сохранением биосферы, трактуя основные цели устойчивого развития как защиту, восстановление экосистем суши и содействие их рациональному использованию, рациональное управление лесами, борьба с опустыниванием, прекращение и обращение вспять процесса деградации земель и прекращение процесса утраты биологического разнообразия.

Бороться за мировую экологию, оставив Россию без финансовой поддержки и под мировыми санкциями, недальновидно [3]. Ведь, для примера, в России значительная часть городов и посёлков городского типа изначально создавалась как инфраструктура градообразующего промышленного предприятия. Значит, непродуманные действия в отношении таких предприятий могут пагубно сказаться на социальной сфере (которая, к слову сказать, определяет суть значительного числа глобальных целей устойчивого развития (ЦУР), составляющих Повестку ООН-2030). Численность постоянного населения Российской Федерации по состоянию на 1 января 2023 г. составляет 146,4 млн человек (девятое место в мире). По своей территории Российская Федерация (17, 125 млн. км²) занимает первое место в мире (идущие следом Канада, США и Китай имеют территорию до 10 млн. км²).

Чтобы определить действительный пул участников-интересантов, уточним, что в ООН в 2024 году представлено 193 страны-члена и 2 страны-наблюдателя из 266 стран мира, в общее число которых кроме стран - членов ООН, входят несколько десятков не признанных или частично признанных, а также стран со спорным статусом.

В России было заявлено о выполнении глобальных стратегических проектов в рамках усилий по выполнению Повестки ООН. Развитие природоподобных технологий в части промышленного производства трактовалось как опора на возобновляемые ресурсы и минимизацию влияния промышленного производства на биосферу. Техногенное влияние человека на природу – вполне вынужденный шаг, ставящий во главу угла удовлетворение потребностей человека даже ценой нанесения невосполнимого ущерба природе. Для снижения биоущерба можно концентрировать производственные ареалы в экологически неблагоприятных регионах при обязательном и достаточном бюджетировании масштабных природоохранных мероприятий для восстановления биоущерба. Учитывая, что до срока исполнения повестки ООН осталось лишь 7 лет, вместо практики заигрывания со здравым смыслом и принятия «судьбоносных решений» целесообразно оценить перспективы использования проверенных налоговых рычагов для побуждения собственника химического производства совершенствовать системы очистки.

В порядке частного мнения, отметим, что, имеющий место популизм (призыв спасти природу за счёт срочного и всеобщего перехода на природоподобные технологии) только многократно усилит последствия мирового финансового кризиса (эти последствия уже проявились эскалацией напряжения в ряде регионов мира) [3, 4]. В рамках Повестки-2030 предлагается, не больше и ни меньше, сменить уклад хозяйствования с природопреобразовательного на природоподобный. Понятно, что это желание должно быть подкреплено (кроме политической воли государств-членов ООН) формированием международного фонда под эгидой ООН с филиалами в странах «преобразовательного пула». Однако, в ближайшей перспективе возможностей даже для формирования рабочих организационных структур не просматривается (Повесткой-2030 занимаются сотрудники Департамента ООН по экономическим и социальным вопросам, деятельность которых ограничивается посильным содействием и сбором информации). Финансирование сверхамбициозной программы мероприятий (а значит, и контроль за исполнением) делегировано государствам-участникам и международным инвесторам.

По данным Департамента ООН по экономическим и социальным вопросам [5], ежегодные потребности в инвестициях для достижения 17 (единогласно принятых голосованием Повестки-2030) глобальных Целей Устойчивого Развития (ЦУР) в области устойчивого развития во всех секторах оцениваются в 5-7 триллионов долларов США. Нынешние объёмы финансирования далеки от требуемого, хотя профильные эксперты ООН, оценивая глобальные

финансовые активы в более чем 200 триллионов долларов США, утверждают, что финансовые ресурсы имеются. Однако большая их часть не направляется на цели устойчивого развития в тех масштабах и теми темпами, которые необходимы для достижения ЦУР и целей Парижского соглашения об изменении климата.

По заключению Департамента ООН по экономическим и социальным вопросам [5], интерес к Целям в области устойчивого развития и инвестиции в них растут, при этом инвестирование в Цели приносит экономическую выгоду. Достижение ЦУР способно открыть рыночные возможности, эквивалентные 12 триллионов долларов США, и обеспечить к 2030 году создание 380 миллионов новых рабочих мест.

Анализ доступной информации показывает, что трудно ожидать серьёзного роста инвестиций в ЦУР по причине устойчивого дефицита государственных бюджетов ведущей десятки стран мира (Таблица 1 [6]).

Таблица 1.

Государственный (не консолидированный) бюджет (по данным Международного валютного фонда [6]) стран мира, ранжированных по показателю доходов бюджета

№	Страна	Доходы, (млн \$)	Расходы, (млн \$)	Дефицит/Профицит, (млн \$)	Год
1	США	5 036 000	6 883 000	-1 847 000	2024
2	Китай	3 622 313	5 388 814	-1 788 501	2020
3	Германия	1 729 224	2 038 247	-309 203	2020
4	Япония	1 666 454	2 362 676	-696 222	2020
5	Франция	1 334 944	1 609 710	-274 666	2020
6	Великобритания	966 407	1 400 776	-434 369	2020
7	Италия	863 785	1 103 721	-239 936	2020
8	Индия	620 739	940 771	-320 032	2020
9	Канада	598 434	917 271	-318 837	2020
10	Испания	481 945	657 750	-175 805	2020

В сентябре 2019 года на Саммите ООН принято решение считать период 2020-2030 гг. «Десятилеткой действий» по успешной реализации Повестки ООН-2030. Трудно ожидать, что в оставшиеся 6 лет будет осуществлён полноценный переход к природоподобной техносфере.

В России указом Президента РФ №474 от 21 июля 2020 года утверждены национальные цели развития страны на период до 2030 года, которые соответствуют ЦУР Повестки ООН по устойчивому развитию до 2030 года, в частности, предусматривают переход на экологически чистые технологии.

В Российской Федерации была упразднена система отраслевых НИИ, которые занимались прикладными исследованиями, развивали отраслевую науку и осуществляли смычку промышленности и науки. Некоторое время научные исследования в интересах производства выполнялись по хозяйственным договорам отдельными фирмами различных форм собственности, вузовской наукой и сотрудниками Российской академии наук. Сегодня почти не осталось научных сотрудников, хорошо знавших производственные реалии. Контакты с производителями на постоянной основе поддерживают лишь отдельные инженерно-внедренческие фирмы и научные сотрудники, добивающиеся присвоения научных степеней.

Таким образом, продвигать государственные обязательства в части создания экологически чистых производств просто некому. Даже выделяемые финансовые средства пока успешно осваивают редкие научные объединения, которые охотно берут на себя обязательства экспертов, координаторов и т.д., но реально не могут быть конкретными исполнителями. Складывается ситуация, подобная развитию нанотехнологий, когда финансовые средства были потрачены, но никаких значимых результатов достигнуто не было.

На сегодня реальной силой, могущей принять на себя функции исполнителя является Российская инженерная академия (президент – член РАН, профессор и академик Б.В. Гусев, сопредседатель Высшего инженерного совета РФ и лауреат 7 (!) государственных премий и премий Правительства СССР и РФ в области науки и техники). Инженерную поддержку в исполнении совместных международных проектов в области устойчивого развития может принять на себя Международная инженерная академия, объединяющая национальные

инженерные академии стран на постсоветском пространстве, а также имеющая рабочие контакты с мировой инженерной общественностью,

В химической и смежных отраслях процесс сушки является наиболее энергоёмким (до 85% всех энергозатрат химического предприятия), определяет товарный вид и потребительские характеристики готового продукта. Из сотен тысяч наименований материалов как объекта сушки до 80% - дисперсные. Интенсификация сушки предполагает серьёзное техногенное воздействие на окружающую среду (за счёт тепловых выбросов и пыления высушиваемого материала).

Очевидно, что сушка заключается в том, что под влиянием поведённого тепла (потоком сушильного агента, например, воздуха) к влажной частице осуществляется перенос влаги от частицы в поток сушильного агента. Механизм переноса жидкости внутри материала в процессе сушки определяется размером пор [7].

Исходя из этого можно условно разбить поры на 5 групп. Первую группу составляют поры диаметром от 100 до 8 нм (от 10–5 до 8·10–7 см). В порах такого диаметра основным механизмом переноса является испарение жидкости из жидкой пленки со стенок капилляров, перенос пара осуществляется под действием кнудсеновской диффузии. Поверхностная диффузия не вносит ощутимого вклада в процесс переноса и составляет не более 4% от общего потока влаги при $d = 10$ нм, а при $d = 5$ нм составляет, по различным данным 13-15%. Ко второй группе относятся поры диаметром от 8 до 6 нм. Основным механизмом переноса в этой группе является кнудсеновская диффузия, коэффициент которой существенно зависит от размера пор, и поверхностная диффузия, вклад которой в общий поток жидкости становится все более ощутимым. Третью группу составляют поры диаметром от 6 до 4 нм; в этой группе основными механизмами переноса являются также кнудсеновская и поверхностная диффузия. В порах четвертой группы ($d = 4 \div 2$ нм) вклад поверхностной диффузии весьма существен и при $d = 2$ нм может составлять 80% от общего потока массы. Скорость сушки падает вследствие меньшей скорости передвижения жидкости в жидкой пленке по сравнению с переносом её по поровым каналам в виде пара. Последнюю пятую группу составляют ультрамикropоры, т.е. поры, диаметр которых соизмерим с размером молекул удаляемой жидкости. В ультрамикropорах диффузия пара весьма затруднена и не является уже ни кнудсеновской, ни поверхностной (это уже - твердотельная диффузия).

Кроме указанных механизмов переноса при сушке материалов в неизотермических условиях возможен перенос влаги в результате термокапиллярного потока, капиллярно-осмотического или электроосмотического скольжения влаги, теплового скольжения пара, термодиффузии и т.д.

Для выбора рационального аппаратного оформления процесса сушки [8, 9] до сих пор большинством разработчиков используется традиционный метод проведения экспериментальных исследований по сушке каждого материала на лабораторных и опытных моделях разных типов аппаратов с последующим сравнительным анализом полученных результатов. Это связано с огромными затратами времени, материалов, труда. Нами разработан и успешно реализуется метод выбора рационального аппаратно-технологического оформления процесса сушки (без проведения прямых исследований по сушке материала на лабораторных или опытных сушилках) на основе комплексного анализа материалов как объектов сушки с использованием принципа соответственных состояний и данных по кинетике сушки типовых модельных материалов [10-19; 23-31].

Для выбора типовых модельных материалов необходима классификация материалов как объектов сушки. Такая классификация разработана нами в рамках авторитетной международной научной школы Б.С. Сажина на основе сорбционно-структурных характеристик (ответственных за диффузионное сопротивление в процессе сушки) и обобщенного технологического показателя, характеризующего адгезионно-когезионные свойства высушиваемого материала [10; 12-14; 18-25]. Показателем, однозначно определяющим принадлежность материала к определенному классу, является критический диаметр пор — наименьших по размеру пор, из которых по технологическим условиям надо удалять влагу.

Предложена методика определения критического диаметра пор из кривых распределения пор по радиусам, полученных по десорбционной ветви изотермы сорбции-десорбции с использованием уравнения Кельвина-Томсона, которая в отличие от большинства известных методов (ртутная порометрия, рентгено-структурный анализ и др.) пригодна не только для гидрофобных, но и для гидрофильных материалов, так как определяет не чисто геометрический,

а эффективный радиус пор с учетом взаимодействия поверхности пор с удаляемой влагой. Полученный таким образом критический диаметр пор является показателем сложности технологической задачи и наибольшего диффузионного сопротивления в процессе сушки данного материала.

Для каждого класса классификационной таблицы выбраны типовые материалы, проведен их детальный комплексный анализ как объектов сушки и определены скорости удаления влаги в активных гидродинамических режимах из всех групп пор (в соответствии с известной классификацией пор по размерам) [19; 12-17; 30-36]. Построена номограмма, позволяющая по кривым распределения пор по размерам построить кривую кинетики сушки материала, не прибегая к непосредственным опытам по сушке данного материала на лабораторных или опытных сушилках. Таким образом, был осуществлен переход от статики к кинетике сушки, используя принцип соответственных состояний. Классификация дисперсных материалов как объектов сушки Б.С. и В.Б. Сажиных соответствует ряду известных классификаций, но существенно информативнее и шире таких классификаций. Так, например, для корреляции с классификацией пор по радиусам проф. Гамаюнова нами для каждого класса материалов указан диффузионный критерий Био, а для соответствия с классификацией Сажина-НИИХИММАШа указано наличие или отсутствие в материале пылевой фракции (для правильного формирования состава сушильной установки).

В качестве основного показателя размеров пор материала предложен критический размер пор $d_{кр}$ (наименьший диаметр пор, из которых по технологическим условиям надо удалять влагу), позволяющий оценить наибольшее в процессе сушки эффективное диффузионное сопротивление (то есть сложность технологической задачи и необходимое время обработки в условиях взвешенного слоя).

Критический диаметр пор $d_{кр}$ может быть определен из кривых распределения пор по размерам, полученных на основе совместного анализа изотерм сорбции-десорбции и уравнения Томсона-Кельвина [10-15; 17-21]. Использование для этой цели других методов (ртутной или газовой порометрии, микроскопического анализа и др.) в отличие от указанного метода позволяет определять чисто геометрические размеры пор без учета взаимодействия удаляемой влаги со стенками пор материала.

В основу нашей с Б.С. Сажиним классификации дисперсных материалов положены величина критического диаметра пор и ранг адгезионно-аутогезионного коэффициента, характеризующего эффекты комкования влажных материалов в процессе сушки и налипания на стенки аппарата [10; 12-14, 17; 23-28]. Согласно указанной классификации (в специальной литературе – классификация Б.С. и В.Б. Сажиных) материалы разделены на шесть классов, охватывающих весь диапазон размеров пор (от 100 до 2 нанометров). Нами для каждой группы материалов [10-19; 29-33] рекомендованы (на основе многолетних исследований) типовые сушилки с эффективными (для данных материалов и поставленной технологической задачи) гидродинамическими режимами. Так, например, для широкопористых материалов с критическим размером пор $d_{кр}$ более 100 нанометров (нм) рекомендованы в зависимости от величины показателя адгезионно-аутогезионных свойств высушиваемых материалов сушилки с режимами пневмотранспорта, циклонным и аэрофонтанным режимом. Для тонкопористых материалов ($d_{кр}$ 6-4 нм) рекомендованы дисковые вихревые сушилки, а для микропористых материалов ($d_{кр}$ 4-2 нм) рекомендованы сушилки с виброкипящим слоем.

Причем, для каждого класса классификационной таблицы рекомендован типовой аппарат, реализующий те гидродинамические режимы взвешенного слоя, которые являются активными при сушке материалов данного класса (Таблица 2).

Таблица 2.

Оптимальные гидродинамические режимы и типовые сушилки для дисперсных материалов классификации Сажиных (авторская разработка)

Класс влажного материала	Эффективный гидродинамический режим	Тип сушилки
Первый	Закрученный поток (ЗПЦ)	Циклонная (ЦС)
	Пневмотранспорт (ПТ)	Труба-сушилка в одну ступень (ТС-1)
Второй	Пневмотранспорт (ПТ)	Труба-сушилка в две ступени (ТС-2)
	Проходящий кипящий слой (ПКС)	С проходящим кипящим слоем (СПКС)
	ПКС+ЗПЦ	Комбинированная циклонная (КЦС)
Третий	Встречные закрученные потоки (ВЗП)	С встречными закрученными потоками (СВЗП)
	Проходящий кипящий слой с режимом свободного фонтанирования (ПКС+СФ)	Комбинированная аэрофонтанная (КАС)
Четвёртый	Вихревой слой (ВС)	Вихревая камера (ВК)
	ВС+ВЗП	Комбинированная безуносная (по твёрдой фазе) с закрученными потоками и вихревой камерой (СВЗП-ВК)
Пятый	Виброкипящий слой (ВКС)	С виброкипящим слоем (ВКС)
Шестой	Виброкипящий слой модифицированный (ВКСМ)	Кипящего слоя с вибрирующими поверхностями нагрева, погружёнными в слой (КСВПН)

Важнейшим фактором, определяющим пригодность типового аппарата для обработки материалов данного класса, является гарантия обеспечения требуемого времени пребывания материала в аппарате, то есть обеспечения получения высушенного продукта при любой начальной влажности (в пределах реальной технологии) и размерах частиц дисперсного материала до 4 мм (материалы с размерами частиц более 4 мм относятся уже к гранулированным материалам) [27; 33; 34].

Наша классификация дисперсных материалов как объектов сушки использует также предложенную нами классификацию гидродинамических режимов взвешенного слоя Б.С. и В.Б. Сажиных, включающую и новые (выявленные и описанные нами с Б.С. Сажиным) ранее неизвестные гидродинамические режимы.

Процесс сушки большинства материалов во многом определяется гидродинамической обстановкой в сушильном аппарате. Нами разработан метод сравнительной оценки активности гидродинамических режимов с использованием эксергетического анализа по величине эксергетических коэффициентов полезного действия [2; 8; 12; 16-19; 27-29]. Этот метод позволяет правильно выбрать гидродинамический режим сушки. Необходимо сопоставлять полезный эффект, получаемый в результате использования эффективных гидродинамических режимов, с затратами на их реализацию.

В качестве показателя, характеризующего термодинамическую эффективность используемых методов активизации гидродинамической обстановки в аппарате, целесообразно использовать отношение эксергетических коэффициентов полезного действия до и после применения указанных методов или для альтернативных технических решений различных авторов. В этом случае эффективным (применительно к конкретному материалу и аппаратному оформлению) следует считать гидродинамический режим, для которого указанный показатель достигает наибольшего значения.

Эксергетический КПД является комплексным показателем для оценки гидродинамического режима и степени загрязнения окружающей среды тепловыми выбросами, которые характеризуют экологическую чистоту сушильной установки [2; 8; 12; 17-19; 23-29].

При этом проблема пылевых выбросов решается в рамках стандартной процедуры стратегии рационального выбора промышленной сушильной установки. Для каждого места классификационной таблицы нами с Б.С. Сажиным не только рекомендована наиболее эффективная сушилка, но и весь комплект вспомогательной аппаратуры: питатели-дозаторы, калориферы, теплообменники, тяго-дутьевое оборудование, системы пылеулавливания, толки и др.). Причём, рекомендованные системы пылеулавливания наилучшим образом соответствуют характеристикам подлежащего сушке дисперсного (или диспергированного) материала, но и характеру технологической задачи

Изложенное позволяет утверждать, что в части процесса сушки дисперсных и диспергируемых материалов в взвешенном слое имеется серьёзный научный и производственный опыт создания (в рамках действующих или проектируемых химических (и смежных) производств) новых и реконструкции уже действующих отделений сушки, функционирующих с минимальным (в рамках современного производственного уклада) экологическим ущербом [1-4; 7-9; 10; 17-19; 37-38].

Список литературы

1. Sazhin Victor. *Energy and resource-saving dryers with counter-swirling flows for the development of nature-like technologies* // Innovative scientific research XIV, 14-15.11.2024. Toronto. Canada. 2024, 453 p. (ISBN: 978-92-44514-28-3). – Pp. 441-453. DOI <https://doi.org/10.5281/zenodo.14199182>
2. Sazhin Victor. *Exergetic analysis of dryer efficiency and of heat-using elements of the component equipment Scientific Investigation* // XXXVII International Multidisciplinary Conference "Recent Scientific Investigation". Proceedings of the Conference (October, 2022). Primedia E-launch LLC, Shawnee, USA. 2022. - 64 p. (ISBN 978-1-64871-560-0). – PP 28-39.
3. Sazhin Victor. *Engineering and technical support for the process of forming an environmentally friendly technosphere* // World science priorities. Proceedings of the XIV International Scientific Conference. Vienna, Austria. 2024.
4. Sazhin V.B. *Engineering and technical support in the formation of an environmentally friendly technosphere* // The priorities of the world science: experiments and scientific debate XXX: Proceedings of the International scientific conference November 25-26, 2024, Morrisville, North Carolina, USA. Section «Economics». – Morrisville (NC, USA): Lulu Press, 2024.
5. The official portal of the UN Sustainable Development Goals. - URL: <https://www.un.org/sustainabledevelopment/ru/> (December 3, 2024).
6. State budget by country // Wikipedia. - URL: https://ru.wikipedia.org/wiki/Gosudarstv_ennyy_blyudzheth_po_stranam (December 3, 2024).
7. Sazhin V.B. *Selecting an efficient dryer within the framework of the strategy for forming a nature-like technosphere* // Proceedings of the XLIX International Multidisciplinary Conference «Innovations and Tendencies of State-of-Art Science». Mijnbestseller Nederland, Rotterdam, Nederland. 2024, 162 p. (ISBN: 978-94-036-1025-2). – Pp. 109-119.
8. Sazhin Victor. *Energy and resource-saving drying units for the implementation of nature-like technologies* // Scientific advances and innovative approaches. Proceedings of the XIV International Scientific and Practical Conference. - Tokyo, Japan. 2024. 250p (ISBN 978-92-44514-26-9). – Pp. 242-250.
9. Sazhin V.B. *Efficient use of suspended bed drying equipment when renewing stocks* // Fundamental and applied sciences today XXXV. - Bengaluru, Karnataka, India: Pothi.com, 2024, p. 206 p. (ISBN: 9781326853310). – Pp. 126-133.
10. Sazhin, VB, Sazhin BS *Scientific foundations of drying technology*. - М.: Science. 1997. – 448 p.
11. Sazhin B.S. Sazhin V.B., Bulekov A.P., *Evaluation of the efficiency of devices with an active hydrodynamic mode based on their exergy characteristics* // Theoretical Foundations of Chemical Technology. 1999. Vol.33. No.5. Pp. 521-527.
12. Sazhin, B.S. *Exergy analysis of industrial installations* / B.S. Sazhin, A.P. Bulekov, V.B. Sazhin. - М.: MTI, 2000. - 297 p.
13. Sazhin, VB *Selection and Calculation of Suspended Bed Apparatus* /VB Sazhin, MB Sazhina. Moscow: RosZITLP. 2001. - 336 p.

14. Sazhin, VB *Drying in Swirling Flows: Theory, Calculation, Technical Solutions* / VB Sazhin, MB Sazhina. Moscow: RosZITLP, 2001. - 324 p.
15. Sazhin V.B. [et al.] *Analysis of thermal conductivity for wet dispersed materials* // *Advances in Chemistry and Chemical Technology*. Vol. XV. 2001, No. 1. P. 33-37.
16. Sazhin B.S., Sazhin V.B., Akulich A.V. *Mathematical modeling of gas movement in the separation zone of a straight-through vortex apparatus based on the (κ_m - ϵ)-turbulence model* // *Theoretical Foundations of Chemical Technology*. 2001, Vol. 35, No. 5, P. 472-478.
17. B.S. Sazhin and V.B. Sazhin *Scientific Principles of Drying Technology* / New York - Connecticut - Wallingford (U.K.): Begell House Inc. - 2007. - 506 PP.
18. Sazhin, VB *Scientific Foundations of the Strategy for Selecting Effective Drying Equipment* / VB Sazhin, B.S. Sazhin. - M.: Chemistry, 2013, 544 p.
19. Sazhin, B.S. *Scientific foundations of heat and moisture treatment of dispersed and rolled materials* / B.S. Sazhin, V.B. Sazhin. M.: Chemistry, 2012, 776 p.
20. Sazhin V.B. [et al.] *Analysis of the main approaches to the classification of materials as drying objects* // *News of universities: Chemistry and chemical technology*, Vol. 48, No. 5, 2005. P. 99-104.
21. Sazhin V.B. [et al.] *Analysis of the main characteristics of wet materials as drying objects during the rational selection of drying equipment* // *News of universities: Chemistry and chemical technology*, Vol. 48, No. 12, 2005. Pp. 98-104.
22. Sazhin V.B. [et al.] *Mathematical model of the process of drying bulk products in a fluidized bed* // *Industrial heat engineering*. - Academy of Sciences of the BSSR, 1985, No. 6, Vol. 7, Pp. 40-46.
23. Sazhin V.B. [et al.] *Optimization of equipment design of drying processes in the suspended bed technique* // *Advances in Chemistry and Chemical Technology*. Vol. XXI. 2007. No. 1 (69). P. 49-65
24. V.B. Sazhin & B.S. Sazhin. *Actual contemporary problems of effective drying of dispersed materials in swirled flows* [Article] // *Sciences of Europe*, # 34, 2018, in 4vv. - Vol. 1. Technical Science. (ISSN 3162-2364, Czech Repub., Praha). - 66 p. - PP. 50-63
25. V. B. Sazhin, B. S. Sazhin *Analysis of the thermal properties of the materials to be dried* // *Sciences of Europe*. Vol. 1, # 12(12), 2017 | *Technical Science*. PP. 100-110. (ISSN 3162-2364, Czech Repub., Praha)
26. V.B. Sazhin. *Taking into account the dependence of thermal characteristics of wet dispersed materials on temperature and humidity when calculating dryers* // *Danish Scientific Journal (DSJ)* No42/2020. - 64 p. - P. 46-53.
27. Sazhin V.B. *Analysis of energy efficiency of dryers with a fluidized bed of dispersed particles* // *Österreichisches Multiscience Journal* # 45, 2021. - Vol. 1. - Innsbruck, Austria, 2021, p. 63. - P. 39-49.
28. Sazhin V.B. *Analysis of phase motion in vortex apparatuses. Theory, experiment, practice* // *Danish Scientific Journal (DSJ)* No64/2022 (ISSN 3375-2389 : Istedgade 104 1650 København V Denmark, 2020. - 73 p. - P. 66-72.
29. Sazhin Victor. *Basics of strategy for selection of effective drying units for disperse materials* // *Prospects and Key Tendencies of Science in Contemporary World XXXVII*. Bubok Publishing S.L., Madrid, Spain. 2023. 152 p. (ISBN 978-94-036-1025-2). - P. 108-117.
30. Sazhin Victor. *Effective resource and energy saving when carrying out heat and mass transfer processes as a vector for reducing anthropogenic load* // *Topical areas of fundamental and applied research XXXIII: Proceedings of the Conference*. Bengaluru, India, 20-21. 11.2023. - Bengaluru, Karnataka, India: Pothi.com, 2023, p. 221 (ISBN: 978-1 4466-5812-3), 124-130 p.
31. Sazhin Victor. *Methods for engineering calculation of characteristics of materials as drying objects and efficient process plants parameters* [Article] // *Annali d'Italia*, # 36: Vol. 1. Florence, Italy, 2022, p. 78 (ISSN 3572-2436). - P. 63-77.
32. Sazhin Victor. *The effect of changing the structure of flows in the apparatus on improving the efficiency of technological processes and the creation of multifunctional apparatuses with controlled (variable) hydrodynamics* // *Norwegian Journal of development of the International Science (NJD): NJD* #99/2022. - Oslo, Norway, 2022. 58 p. (ISSN 3453-987). - P. 47-57.
33. V.B. Sazhin *Utilization of heat from heat-technological equipment in multifunctional vortex-type apparatuses* // *The Strategies of Modern Science Development: XXII International scientific-practical conference*. October 18-19, 2022, Morrisville, NC, USA
34. Sazhin V.B. *Vortex devices with effective hydrodynamic modes for sustainable development* // *Danish Scientific Journal (DSJ)* No78/2023. - København, Denmark, 2023 (ISSN 3375-2389). - 95 p. - P. 82-94.

35. Sazhin Victor. *Assessment of hydrodynamics of flows in the apparatus, modeling and calculation of vortex dust collectors with counter swirling flows* [Article] // *Annali d'Italia*, # 50: Vol. 1. Florence, Italy, 2023, p. 70 (ISSN 3572-2436). – P. 51-69.
36. Sazhin Victor. *Application of multifunctional devices vortex layer when implementing the concept sustainable development* // *Innovations and Tendencies of State-of-Art Science XXXVII*. Mijnbestseller Rotterdam, Nederland. 2023. 152 p. (ISBN 978-94-036-1025-2). – P. 108-117.
37. Sazhin Victor. *Efficient use of obsolete drying equipment when preparing it for operation after long-term storage* // *Proceedings of the XLVIII International Multidisciplinary Conference «Prospects and Key Tendencies of Science in Contemporary World»*. Bubok Publishing S.L., Madrid, Spain. 2024. 146 p. (ISBN 978-84-685-5375-7). – P. 97-108.
38. Sazhin Victor. *Rational use of suspended bed modes for efficient drying of dispersed materials* // *Modern science: actual problems XVI*. - Manchester. United Kingdom, 2024, p. 133 (ISBN: 978-91-65423-93-0). – PP. 126-133. DOI <https://doi.org/10.5281/zenodo.14091395>



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