

ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print)



SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS

PUBLISHED SINCE 1944

4 (416)

JULY – AUGUST 2025

ALMATY, 2025

EDITOR-IN-CHIEF:

ABYLKASSIMOVA Alma Yesimbekovna, Doctor of Pedagogical Sciences, Professor, Academician of NAS RK, Director of the Center for the Development of Pedagogical Education, Head of the Department of Methods of Teaching Mathematics, Physics and Computer Science at Abai KazNPU (Almaty, Kazakhstan), <https://www.scopus.com/authid/detail.uri?authorId=57191275199>, <https://www.webofscience.com/wos/author/record/2076124>.

DEPUTY EDITOR-IN-CHIEF:

SEMBIEVA Lyazzat Myktybekovna, Doctor of Economics, Professor of the Eurasian National University (Astana, Kazakhstan), <https://www.scopus.com/authid/detail.uri?authorId=57194226348>, <https://www.webofscience.com/wos/author/record/38875302>.

EDITORIAL BOARD:

RICHELLE Marynowski, PhD in Education, Professor, Faculty of Education, University of Lethbridge, (Alberta, Canada), <https://www.scopus.com/authid/detail.uri?authorId=57070452800>, <https://www.webofscience.com/wos/author/record/16130920>.

SHISHOV Sergey Evgenievich, Doctor of Pedagogical Sciences, Professor, Head of the Department of Pedagogy and Psychology of Professional Education, Moscow State University of Technology and Management named after K. Razumovsky (Moscow, Russia), <https://www.scopus.com/authid/detail.uri?authorId=57191518233>, <https://www.webofscience.com/wos/author/record/2443966>.

ABILDINA Saltanat Kuatovna, Doctor of Pedagogical Sciences, Professor, Head of the Department of Pedagogy, Karaganda University named after E.A. Buketov (Karaganda, Kazakhstan), <https://www.scopus.com/authid/detail.uri?authorId=56128026400>, <https://www.webofscience.com/wos/author/record/4131549>.

RYZHAKOV Mikhail Viktorovich, Doctor of Pedagogical Sciences, Professor, Academician of the Russian Academy of Education, Editor-in-Chief of the journal “Standards and Monitoring in Education” (Moscow, Russia), <https://www.scopus.com/authid/detail.uri?authorId=6602245542>, <https://www.webofscience.com/wos/author/record/13675462>.

BULATBAEVA Kulzhanat Nurymzhanovna, Doctor of Pedagogical Sciences, Professor, Chief Researcher of the National Academy of Education named after Y. Altynsarin (Astana, Kazakhstan), <https://www.scopus.com/authid/detail.uri?authorId=57202195074>, <https://www.webofscience.com/wos/author/record/40173122>.

PETR Hájek, PhD, Unicorn University, Associate Professor, Department of Finance, (Czech Republic), <https://www.scopus.com/authid/detail.uri?authorId=35726855800>, <https://www.webofscience.com/wos/author/record/672404>.

JUMAN Jappar, Doctor of Economics, Professor, Honorary Academician of NAS RK, Honored Worker of Kazakhstan, Director of the Center for International Applied Research Al-Farabi Kazakh National University (Almaty, Kazakhstan) <https://www.scopus.com/authid/detail.uri?authorId=59238481900>; <https://www.scopus.com/authid/detail.uri?authorId=56658765400>, <https://www.webofscience.com/wos/author/record/60977874>.

LUKYANENKO Irina Grigorievna, Doctor of Economics, Professor, Head of Department of the National University of Kyiv-Mohyla Academy (Kyiv, Ukraine), <https://www.scopus.com/authid/detail.uri?authorId=57189348551>, <https://www.webofscience.com/wos/author/record/939510>.

YESIMZHANOVA Saira Rafihevna, Doctor of Economics, Professor of the University of International Business (Almaty, Kazakhstan), <https://www.scopus.com/authid/detail.uri?authorId=56499485500>, <https://www.webofscience.com/wos/author/record/45951098>.

Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Owner: «Central Asian Academic Research Center» LLP (Almaty).

The certificate of registration of a periodical printed publication in the Committee of information of the Ministry of Information and Communications of the Republic of Kazakhstan **No. 3620-Ж**, issued on 05.06.2025

Thematic focus: *«publication of the results of new achievements in the field of fundamental sciences»*

Periodicity: 6 times a year.

<http://www.bulletin-science.kz/index.php/en/>

© «Central Asian Academic Research Center» LLP, 2025



БАС РЕДАКТОР:

ӘБІЛҚАСЫМОВА Алма Есімбекқызы, педагогика ғылымдарының докторы, профессор, ҚР ҰҒА академигі, Педагогикалық білім беруді дамыту орталығының директоры, Абай атындағы ҚазҰПУ математика, физика және информатиканы оқыту әдістемесі кафедрасының меңгерушісі (Алматы, Қазақстан), <https://www.scopus.com/authid/detail.uri?authorId=57191275199>, <https://www.webofscience.com/wos/author/record/2076124>.

БАС РЕДАКТОРДЫҢ ОРЫНБАСАРЫ:

СЕМБИЕВА Ләззат Мықтыбекқызы, экономика ғылымдарының докторы, Л.Н.Гумилев атындағы Еуразия ұлттық университетінің профессоры (Астана, Қазақстан), <https://www.scopus.com/authid/detail.uri?authorId=57194226348>, <https://www.webofscience.com/wos/author/record/38875302>.

РЕДАКЦИЯ АЛҚАСЫ:

РИШЕЛЬ Мариновски, білім беру саласындағы PhD, Летбридж университеті педагогика факультетінің профессоры, (Альберта, Канада), <https://www.scopus.com/authid/detail.uri?authorId=57070452800>, <https://www.webofscience.com/wos/author/record/16130920>.

ШИШОВ Сергей Евгеньевич, педагогика ғылымдарының докторы, профессор, К.Разумовский атындағы Мәскеу мемлекеттік технологиялар және басқару университетінің кәсіби білім беру педагогикасы және психологиясы кафедрасының меңгерушісі (Мәскеу, Ресей), <https://www.scopus.com/authid/detail.uri?authorId=57191518233>, <https://www.webofscience.com/wos/author/record/2443966>.

ӘБІЛДИНА Салтанат Қуатқызы, педагогика ғылымдарының докторы, профессор, Е.А.Бөкетов атындағы Қарағанды университетінің педагогика кафедрасының меңгерушісі (Қарағанды, Қазақстан), <https://www.scopus.com/authid/detail.uri?authorId=56128026400>, <https://www.webofscience.com/wos/author/record/4131549>.

РЫЖАКОВ Михаил Викторович, педагогика ғылымдарының докторы, профессор, Ресей білім академиясының академигі, «Білім берудегі стандарттар мен мониторинг» журналының бас редакторы (Мәскеу, Ресей), <https://www.scopus.com/authid/detail.uri?authorId=6602245542>, <https://www.webofscience.com/wos/author/record/13675462>.

БОЛАТБАЕВА Күлжанат Нұрымжанқызы, педагогика ғылымдарының докторы, профессор, Ы. Алтынсарин атындағы Ұлттық білім академиясының бас ғылыми қызметкері (Астана, Қазақстан), <https://www.scopus.com/authid/detail.uri?authorId=57202195074>, <https://www.webofscience.com/wos/author/record/40173122>.

ПЕТР Хайек, PhD, Юникорн университеті, Қаржы департаментінің қауымдастырылған профессоры (Чех Республикасы), <https://www.scopus.com/authid/detail.uri?authorId=35726855800>, <https://www.webofscience.com/wos/author/record/672404>.

ЖҰМАН Жаппар, экономика ғылымдарының докторы, профессор, Қазақстанның Еңбек сіңірген қайраткері, ҚР ҰҒА құрметті академигі, әл-Фараби атындағы Қазақ ұлттық университетінің Халықаралық қолданбалы зерттеулер орталығының директоры (Алматы, Қазақстан). <https://www.scopus.com/authid/detail.uri?authorId=59238481900>; <https://www.scopus.com/authid/detail.uri?authorId=56658765400>, <https://www.webofscience.com/wos/author/record/60977874>.

ЛУКЪЯНЕНКО Ирина Григорьевна, экономика ғылымдарының докторы, профессор, «Киево-Могилянская академия» ұлттық университеті кафедрасының меңгерушісі (Киев, Украина), <https://www.scopus.com/authid/detail.uri?authorId=57189348551>, <https://www.webofscience.com/wos/author/record/939510>.

ЕСІМЖАНОВА Сайра Рафихқызы, экономика ғылымдарының докторы, Халықаралық бизнес университетінің профессоры (Алматы, Қазақстан), <https://www.scopus.com/authid/detail.uri?authorId=56499485500>, <https://www.webofscience.com/wos/author/record/45951098>.

Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Меншіктенуші: «Орталық Азия академиялық ғылыми орталығы» ЖШС (Алматы қ.).

Қазақстан Республикасының Ақпарат және коммуникациялар министрлігінің Ақпарат комитетінде 05.06.2025 ж. берілген № 3620-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік.

Тaqырыптық бағыты: *«іргелі ғылым салалары бойынша жаңа жетістіктердің нәтижелерін жариялау»*

Мерзімділігі: жылына 6 рет.

<http://www.bulletin-science.kz/index.php/en/>

© «Орталық Азия академиялық ғылыми орталығы» ЖШС, 2025

ГЛАВНЫЙ РЕДАКТОР:

АБЫЛКАСЫМОВА Алма Есимбековна, доктор педагогических наук, профессор, академик НАН РК, директор Центра развития педагогического образования, заведующая кафедрой методики преподавания математики, физики и информатики КазНПУ им. Абая (Алматы, Казахстан), <https://www.scopus.com/authid/detail.uri?authorId=57191275199>, <https://www.webofscience.com/wos/author/record/2076124>.

ЗАМЕСТИТЕЛЬ ГЛАВНОГО РЕДАКТОРА:

СЕМБИЕВА Ляззат Мыктыбековна, доктор экономических наук, профессор Евразийского национального университета им. Л.Н. Гумилева (Астана, Казахстан), <https://www.scopus.com/authid/detail.uri?authorId=57194226348>, <https://www.webofscience.com/wos/author/record/38875302>.

РЕДАКЦИОННАЯ КОЛЛЕГИЯ:

РИШЕЛЬ Мариновски, PhD в области образования, профессор факультета педагогики Летбриджского университета, (Альберта, Канада), <https://www.scopus.com/authid/detail.uri?authorId=57070452800>, <https://www.webofscience.com/wos/author/record/16130920>.

ШИШОВ Сергей Евгеньевич, доктор педагогических наук, профессор, заведующий кафедрой педагогики и психологии профессионального образования Московского государственного университета технологий и управления имени К. Разумовского (Москва, Россия), <https://www.scopus.com/authid/detail.uri?authorId=57191518233>, <https://www.webofscience.com/wos/author/record/2443966>.

АБИЛЬДИНА Салтанат Куатовна, доктор педагогических наук, профессор, заведующая кафедрой педагогики Карагандинского университета имени Е.А. Букетова (Караганда, Казахстан), <https://www.scopus.com/authid/detail.uri?authorId=56128026400>, <https://www.webofscience.com/wos/author/record/4131549>.

РЫЖАКОВ Михаил Викторович, доктор педагогических наук, профессор, академик Российской академии образования, главный редактор журнала «Стандарты и мониторинг в образовании» (Москва, Россия), <https://www.scopus.com/authid/detail.uri?authorId=6602245542>, <https://www.webofscience.com/wos/author/record/13675462>.

БУЛАТБАЕВА Кулжанат Нурымжановна, доктор педагогических наук, профессор, главный научный сотрудник Национальной академии образования имени Ы. Алтынсарина (Астана, Казахстан), <https://www.scopus.com/authid/detail.uri?authorId=57202195074>, <https://www.webofscience.com/wos/author/record/40173122>.

ПЕТР Хайек, PhD, университет Юникорн, ассоциированный профессор Департамента финансов, (Чешская Республика), <https://www.scopus.com/authid/detail.uri?authorId=35726855800>, <https://www.webofscience.com/wos/author/record/672404>.

ЖУМАН Жаппар, доктор экономических наук, профессор, заслуженный деятель Казахстана, почетный академик НАН РК, директор Центра Международных прикладных исследований Казахского национального университета им. аль-Фараби (Алматы, Казахстан) <https://www.scopus.com/authid/detail.uri?authorId=59238481900>; <https://www.scopus.com/authid/detail.uri?authorId=56658765400>, <https://www.webofscience.com/wos/author/record/60977874>.

ЛУКЬЯНЕНКО Ирина Григорьевна, доктор экономических наук, профессор, заведующая кафедрой Национального университета «Киево-Могилянская академия» (Киев, Украина), <https://www.scopus.com/authid/detail.uri?authorId=57189348551>, <https://www.webofscience.com/wos/author/record/939510>.

ЕСИМЖАНОВА Сайра Рафихевна, доктор экономических наук, профессор Университета международного бизнеса (Алматы, Казахстан), <https://www.scopus.com/authid/detail.uri?authorId=56499485500>, <https://www.webofscience.com/wos/author/record/45951098>.

Scientific Journal of Pedagogy and Economics

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Собственник: ТОО «Центрально-азиатский академический научный центр» (г. Алматы).

Свидетельство о постановке на учет периодического печатного издания в Комитете информации Министерства информации и коммуникаций и Республики Казахстан № **3620-Ж**, выданное 05.06.2025 г.

Тематическая направленность: *«публикация результатов новых достижений в области фундаментальных наук».*

Периодичность: 6 раз в год.

<http://www.bulletin-science.kz/index.php/en/>

© ТОО «Центрально-азиатский академический научный центр», 2025



CONTENTS

PEDAGOGY

G.M. Abdimanapova, S.E. Aldeshov, L.K. Zhaydakbayeva Analysis of Python programming lessons for high school students.....	14
B.A. Aidarova, A.S. Amirova Opportunities for the development of professional success of future primary school teachers in the context of dual education.....	26
A. Amirbekuly, R.I. Kadirbayeva, K.U. Nyshanbayeva Improving the training of future mathematics teachers based on constructive learning to compose and solve open problems.....	43
S.B. Dyussebaeva, U.K. Orynbayeva, S.S. Zhakipbekova Structural features of forming foreign communicative competence in primary school students.....	61
B. Yermakhanov, T. Daniarov, T. Apendiyev Formation of a healthy lifestyle in students: experimental study and research Results.....	80
G.K. Yeshmurat, L.S. Kainbayeva Examining math anxiety in secondary education: influence of demographics, educational context, and instructional support.....	99
N.B. Imankul, A.B. Ibashova, M.Zh. Koshkinbayeva The role of artificial intelligence in education in the training of future computer science teachers.....	114
A.A. Issatayeva, A.M. Nurbayeva, Serkan Kosar Blended learning technologies in the development of oral and written speech of primary school students.....	131
L.B. Kabylbekova, B.S. Abdimanapov, D.D. Baidaliyev Pedagogical aspects of teaching natural hazards in school geography course.....	150
N. Karelkhan, A.M. Yessengaliyev Analyzing the use of sign language recognition technologies in inclusive learning environment.....	164
A.S. Karmanova, N.K. Akhmetov, G.M. Madybekova Applying gamification in the digital transformation of chemistry education.....	177

G.Zh. Matzhanova, A.Z. Kairzhanova

Teaching languages at secondary school through Lesson study.....194

A.B. Medeshova

Digitalization and open educational space: new opportunities
for Part-time learning model.....209

M.S. Orazalina, A.Zh. Turikpenova, A.V. Sazhyna

Linguistic and cultural aspect of contrastive vocabulary work in the process
of teaching a foreign language.....227

F.S. Orazbayeva

Neurolinguistic methods contributing to the development of communicative
Skills.....245

G. Pilten, A. Kuralbayeva, I. Sönmez

Global use of the Denver II: validity, reliability, and cultural adaptation.....261

E. Satov, M. Kozha, E. Konuralp

Basic sources and methodology of medieval Turkish-Muslim sources.....274

M.E. Toiganbekova, G.A. Kazhigaliyeva

Linguoculturological competence: analysis of educational texts.....293

D. Toktaruly

Developing time management skills of adolescents with mild intellectual
disabilities within the subject of «Vocational training».....307

K.Zh. Uteyeva, G.K. Kassymova, A.K. Sadibekov

Overview on shaping national identity through education in the digital era.....323

ECONOMICS

A.T. Abubakirova, R.M. Tazhibayeva, S.A. Kaltayeva

Development of space tourism and future prospects.....341

A.S. Bekbolsynova, L.M. Sembiyeva, Z.R. Bashu

Implementing strategic goals for business integrity through digital
tax administration.....354

A.B. Bersimbayeva, Y.R. Bersimbayev, A.B. Maidyrova

Evaluating ESG implementation in Kazakhstan's leading universities372

M. Zhamkeyeva, T. Diba, A.K. Abzhatova

Transformation of financing mechanisms for small and medium-sized enterprises in the agricultural sector of Kazakhstan.....384

J. Juman, M.A. Yezhebekov, A.A. Cheirkhanova

ESG principles in quality and profitability management of construction companies of Kazakhstan.....401

A.Zh. Ismailova, A.A. Burtebayeva, Kh. Bektemir

Developing a new public audit paradigm in the age of technological change.....417

A. Kabybay, A. Oralova, C. Cheslovas

State audit approaches to assessing the effectiveness of environmental expenditures in Kazakhstan.....429

A.S. Karbozova, A.K. Bekhozhaeva, M.Sh. Kushenova

Introduction of digital technologies in agricultural management.....442

A. Kuanaliyev, O. Slinkova

Digitalization of public administration in world practice and on the example of the Republic of Kazakhstan.....459

G. Lukhmanova, N. Sartanova, K. Baisholanova

Financial literacy as a key mechanism of fraud avoidance.....477

B.O. Mukanov, G.M. Mukhamedieva, Z.B. Akhmetova, A.N. Lambekova

Gambling market analysis in Kazakhstan.....494

G.A. Rakhymzhanova, N.N. Zhanakova

Household expenditure structure in Kazakhstan: a quantitative assessment.....517

Z.T. Satpayeva, N.M. Akimova, D.M. Kangalakova

The impact of women's scientific activities on Kazakhstan's economic and innovative development.....529

Ye.S. Tursyn, A. Khoich

Development of a methodology for evaluating the effectiveness of investments in agribusiness based on the analysis of the agricultural potential of the East Kazakhstan region.....542

N.M. Sherimova, L.M. Davidenko, A.A. Titkov

Platform ecologization and promotion of ecological branding of industrial complex of Pavlodar region.....566

МАЗМҰНЫ

ПЕДАГОГИКА

Г.М. Абдиманапова, С.Е. Алдешов, Л.К. Жайдакбаева

Жоғары сынып оқушылары үшін Python бағдарламалау сабақтарының үрдістерін талдау.....14

Б.А. Айдарова, А.С. Амирова

Дуальді білім беру жағдайында болашақ бастауыш сынып мұғалімдерінің кәсіби табыстылығын дамытудың мүмкіндіктері.....26

А. Әмірбекұлы, Р.И. Кадирбаева, К.У. Нышанбаева

Ашық есептерді құрастыру мен шешуге конструктивті оқыту негізінде болашақ математик-мұғалімдерді даярлауды жетілдіру.....43

С.Б. Дюсебаева, Ұ.Қ. Орынбаева, С.С. Жакипбекова

Оқыту үдерісінде бастауыш сынып оқушыларының шеттілдік коммуникативтік құзыреттілігін қалыптастырудың құрылымдық ерекшеліктері.....61

Б.Ө. Ермаханов, Т.Ә. Данияров, Т.А. Апендиев

Студенттердің салауатты өмір салтын қалыптастыру: эксперименттік зерттеу және ғылыми нәтижелер.....80

Г.Қ. Ешмұрат, Л.С. Каинбаева

Орта білім беру жүйесінде математикалық мазасыздықты зерттеу: демографиялық факторлардың, білім беру ортасының және оқу барысындағы қолдаудың ықпалы.....99

Н.Б. Иманқұл, А.Б. Ибашова, М.Ж. Кошкинбаева

Болашақ информатика мұғалімдерін даярлауда жасанды интеллектінің білім берудегі рөлі.....114

А.А. Исатаева, А.М. Нұрбаева, Серкан Кошар

Бастауыш сынып оқушыларының ауызша және жазбаша тілін дамытудағы аралас оқыту технологиялары.....131

Л.Б. Қабылбекова, Б.Ш. Абдиманов, Д.Д. Байдалиев

Мектеп географиясында табиғи қауіптерді оқытудың педагогикалық аспектілері.....150

Н. Карелхан, Ә.М. Есенғалиев

Ымдау тілін тану технологияларын инклюзивті оқу ортасында қолдануды талдау.....164

Ә.С. Қарманова, Н.К. Ахметов, Г.М. Мадыбекова

Химияны оқыту процесін цифрландыруда геймификацияны қолдану.....177

Г.Ж. Матжанова, А.З. Кайржанова

Lesson study арқылы мектепте тілдерді оқыту тәжірибесі.....194

А.Б. Медешова

Цифрландыру және ашық білім беру кеңістігі: Part-time оқу моделі үшін жаңа мүмкіндіктер.....209

М.С. Оразалина, А.Ж. Турикпенова, А.В. Сажина

Шет тілін оқыту процесіндегі қарама-қарсы лексикалық жұмыстың лингвистикалық және мәдени аспектісі.....227

Ф.Ш. Оразбаева

Коммуникативтік дағдыны дамытуға ықпал ететін нейролингвистикалық тәсілдер.....245

Г. Пилтен, А. Куралбаева, И. Сонмез

Денвер II тесті: жаһандық қолданылуы, дұрыстығы, сенімділігі және мәдени бейімделуі.....261

Е. Сатов, М. Қожа, Ержиласун Конуралып

Ортағасырлық түркі-мұсылман деректерінің деректанулық және методологиясы негіздері.....274

М.Е. Тойганбекова, Г.А. Кажигалиева

Тілдік-мәдени құзыреттілік: оқу мәтіндерін талдау.....293

Д. Тоқтарұлы

«Кәсіби еңбек» пәні аясында зияты жеңіл зақымдалған жеткіншектердің тайм-менеджменттік дағдыларын дамыту.....307

К.Ж. Утеева, Г.К. Касимова, Сәдібеков

Цифрлық дәуірде білім беру арқылы ұлттық сананы қалыптастыруға шолу.....323

ЭКОНОМИКА**А.Т. Абубакирова, Р.М. Тажибаева, С.А. Қалтаева**

Ғарыштық туризмнің дамуы және болашақ перспективалар.....341

А.С. Бекболсынова, Л.М. Сембиева, З.Р. Башу

Салық әкімшілігін цифрландыру арқылы бизнестегі адалдықты дамыту стратегиялық мақсаттарын іске асыру.....354

А.Б. Берсимбаева, Е.Р. Берсимбаев, А.Б. Майдырова

Қазақстанның жетекші университеттеріне ESG қағидаттарын енгізуді бағалау.....372

М. Жамкеева, Т. Диба, А.К. Абжатова

Қазақстан ауыл шаруашылығындағы шағын және орта бизнесті қаржыландыру механизмдерінің трансформациясы.....384

Ж. Жұман, М.А. Еজেбеков, А.А. Чейрханова

Қазақстанның құрылыс компанияларының сапасы мен рентабельділігін басқарудағы ESG-қағидаттар.....401

Ә.Ж. Исмаилова, А.А. Буртебаева, Х. Бектемир

Технологиялық қайта құру жағдайында мемлекеттік аудиттің жаңа парадигмасын әзірлеу қажеттілігі.....417

А. Қабдыбай, А. Оралова, С. Cheslovas

Қазақстандағы табиғатты қорғау шығындарының тиімділігін бағалаудағы мемлекеттік аудиттің қолданылатын тәсілдері.....429

А.С. Карбозова, А.Қ. Бекхожаева, М.Ш. Кушенова

Ауыл шаруашылығын басқаруда цифрлық технологияларды енгізу.....442

А. Қуаналиев, О. Слинкова

Әлемдік тәжірибеде және Қазақстан Республикасының мысалында мемлекеттік басқаруды цифрландыру.....459

Г. Лухманова, Н. Сарганова, К. Байшоланова

Қаржылық сауаттылық негізгі механизм ретінде алаяқтықтан аулақ болу.....477

Б.О. Мұқанов, Г.М. Мұхамедиева, З.Б. Ахметова, А.Н. Ламбекова

Қазақстанның құмар ойындар нарығын талдау.....494

Г.А. Рахимжанова, Н.Н. Жанакоева

Қазақстандағы үй шаруашылықтары шығындарының құрылымы: сандық бағалау.....517

З.Т. Сатпаева, Н.М. Акимова, Д.М. Кангалакова

Қазақстанның экономикалық және инновациялық дамуына әйелдердің ғылыми қызметінің әсері.....529

Е.С. Тұрсын, А. Хойч

Шығыс Қазақстан облысының ауыл шаруашылығы әлеуетін талдау негізінде агробизнеске салымдардың тиімділігін бағалау әдістемесін әзірлеу.....542

Н.М. Шеримова, Л.М. Давиденко, А.А. Титков

Павлодар өңірінің өнеркәсіптік кешенінің экологиялық брендингін платформалық экологияландыру және ілгерілету.....566

СОДЕРЖАНИЕ

ПЕДАГОГИКА

Г.М. Абдимананова, С.Е. Алдешов, Л.К. Жайдакбаева

Анализ эффективности уроков программирования на Python для учащихся старших классов.....14

Б.А. Айдарова, А.С. Амирова

Возможности развития профессиональной успешности будущих учителей начальных классов в условиях дуального образования.....26

А. Амирбекулы, Р.И. Кадирбаева, К.У. Нышанбаева

Совершенствование подготовки будущих учителей-математиков на основе конструктивного обучения составлению и решению открытых задач.....43

С.Б. Дюсебаева, У.К. Орынбаева, С.С. Жакипбекова

Структурные особенности формирования иноязычной коммуникативной компетенции младших школьников в процессе обучения.....61

Б.О. Ермаханов, Т.А. Данияров, Т.А. Апендиев

Формирование здорового образа жизни у студентов: экспериментальная работа и результаты исследования.....80

Г.К. Ешмурат, Л.С. Каинбаева

Изучение математической тревожности в средней школе: влияние демографических факторов, образовательного контекста и поддержки в обучении.....99

Н.Б. Иманкул, А.Б. Ибашова, М.Ж. Кошкинбаева

Роль искусственного интеллекта в образовании при подготовке будущих учителей информатики.....114

А.А. Исатаева, А.М. Нурбаева, Серкан Кошар

Технологии смешанного обучения в развитии устной и письменной речи учащихся начальных классов.....131

Л.Б. Кабылбекова, Б.Ш. Абдимананов, Д.Д. Байдалиев

Педагогические аспекты обучения природным опасностям в школьной географии.....150

Н. Карелхан, А.М. Есенгалиев

Анализ использования технологий распознавания языка жестов в инклюзивной образовательной среде.....164

А.С. Карманова, Н.К. Ахметов, Г.М. Мадыбекова

Использование геймификации в цифровизации обучения химии.....177

Г.Ж. Матжанова, А.З. Кайржанова

Опыт преподавания языков в школе с использованием Lesson study.....194

А.Б. Медешова

Цифровизация и открытое образовательное пространство: новые возможности для модели Part-time обучения.....209

М.С. Оразалина, А.Ж. Турикпенова, А.В. Сажина

Лингвострановедческий аспект контрастивной словарной работы в процессе преподавания иностранного языка.....227

Ф.Ш. Оразбаева

Коммуникативные навыки и нейролингвистические методы, способствующие их развитию.....245

Г. Пилтен, А. Куралбаева, И. Сонмез

Применение теста Денвер II: валидность, надежность и культурная адаптация.....261

Е. Сатов, М. Кожа, Ержиласун Конуральп

Основы источниковедения и методологии средневековых тюрко-мусульманских источников.....274

М.Е. Тойганбекова, Г.А. Кажигалиева

Лингвокультурологическая компетенция: анализ учебных текстов.....293

Д. Токтарулы

Развитие тайм-менеджмент навыков у подростков с лёгкими интеллектуальными нарушениями в рамках предмета «Профессиональный труд».....307

К.Ж. Утеева, Г.К. Касымова, А.К. Садибеков

Обзор формирования национальной идентичности посредством образования в цифровую эпоху.....323

ЭКОНОМИКА

А.Т. Абубакирова, Р.М. Тажибаева, С.А. Калтаева

Развитие космического туризма и перспективы на будущее.....341

А.С. Бекболсынова, Л.М. Сембиева, З.Р. Башу

Реализация стратегических целей развития добросовестности в бизнесе через цифровизацию налогового администрирования.....354

А.Б. Берсимбаева, Е.Р. Берсимбаев, А.Б. Майдырова

Оценка внедрения принципов Esg в ведущих университетах Казахстана.....372

М. Жамкеева, Т. Дибя, А.К. Абжатов

Трансформация механизмов финансирования малого и среднего бизнеса
в сельском хозяйстве Казахстана.....384

Ж. Жуман, М.А. Ежебеков, А.А. Чейрханова

ESG-принципы в управлении качеством и рентабельностью строительных
компаний Казахстана.....401

А.Ж. Исмаилова, А.А. Буртебаева, Х. Бектемир

Необходимость разработки новой парадигмы государственного аудита
в условиях технологических преобразований.....417

А. Кабдыбай, А. Оралова, С. Cheslovas

Подходы государственного аудита к оценке эффективности
природоохранных расходов в Казахстане.....429

А.С. Карбозова, А.К. Бекхожаева, М.Ш. Кушенова

Внедрение цифровых технологий в управлении сельским хозяйством.....442

А. А. Куналиев, О. Слинкова

Цифровизация государственного управления в мировой практике
и на примере Республики Казахстан.....459

Г. Лухманова, Н. Сарганова, К. Байшоланова

Финансовая грамотность как ключевой механизм избежания
мошенничества.....477

Б.О. Муканов, Г.М. Мухамедиева, З.Б. Ахметова, А.Н. Ламбекова

Анализ рынка азартных игр Казахстана.....494

Г.А. Рахимжанова, Н.Н. Жанакова

Структура расходов домохозяйств Казахстана: количественная оценка.....517

З.Т. Сатпаева, Н.М. Акимова, Д.М. Кангалакова

Влияние научной деятельности женщин на экономическое и инновационное
развитие Казахстана.....529

Е.С. Турсын, А. Хойч

Разработка методики оценки эффективности вложений в агробизнес на
основе анализа сельскохозяйственного потенциала Восточно-Казахстанской
области.....542

Н.М. Шеримова, Л.М. Давиденко, А.А. Титков

Платформенная экологизация и продвижение экологического брендинга
промышленного комплекса Павлодарского региона.....566

SCIENTIFIC JOURNAL OF PEDAGOGY AND ECONOMICS

ISSN 1991-3494

Volume 4.

Number 416 (2025), 323–340

<https://doi.org/10.32014/2025.2518-1467.1004>

UDC 378

IRSTI: 14.01.45

© K.Zh. Uteyeva¹, G.K. Kassymova^{1*}, A.K. Sadibekov², 2025.¹Abai Kazakh National Pedagogical University, Almaty, Kazakhstan;²Khoja Akhmet Yassawi International Kazakh-Turkish University,
Turkestan, Kazakhstan.

*E-mail: zhaina.kassym@gmail.com

OVERVIEW ON SHAPING NATIONAL IDENTITY THROUGH EDUCATION IN THE DIGITAL ERA

Uteyeva K.Zh. — Lecturer, Abai Kazakh National Pedagogical University, Almaty, Kazakhstan,
E-mail: uteeva.kundyz@mail.ru, ORCID ID: <https://orcid.org/0009-0009-8947-4918>;

Kassymova G.K. — Ph.D., Abai Kazakh National Pedagogical University, Almaty, Kazakhstan,
E-mail: zhaina.kassym@gmail.com, ORCID ID: <https://orcid.org/0000-0001-7004-3864>;

Sadibekov A.K. — Ph.D., Khoja Akhmet Yassawi International Kazakh-Turkish University, Turkestan,
Kazakhstan,

E-mail: askat.sadibekov@ayu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-6567-436X>.

Abstract. This article examines the issues of forming national identity through education in the digital era by conducting a bibliometric analysis of scientific publications between 2009-2025. Spiritual heritage and national consciousness of Kh.A. Yassawi, the philosophical ideas of Al-Farabi and the national code, the thoughts of A. Kunanbayev and their role in the patriotic education of youth were examined from a philosophical perspective. The authors study the dynamics of the formation of national identity and patriotism in the post-independence period of Kazakhstan. In addition, the potential of new technologies such as VR, AI, immersive cultural experiences, digital platforms and educational content was analyzed. With the help of these technologies, opportunities are opened for students to familiarize themselves with the historical and cultural heritage in a new way, create an interactive educational environment, and effectively convey patriotic values. The research results showed that the effective use of digital technologies has a significant impact on the renewal of national values, the preservation of the cultural code, and the strengthening of the cultural identity of young people in the context of globalization. Special attention is paid to the methods of integrating patriotism, national identity, and knowledge. The analysis of the content of publications made it possible to identify innovative approaches aimed at preserving national identity. It provides practical recommendations for educators and politicians working in a multicultural,

digital society in developing the national identity of young people. Simultaneously, it provides a basis for preserving national identity through the integration of digital technologies into the education system.

Keywords: national consciousness, national identity, VR technology, language, educators, teaching

© **К.Ж. Утеева¹, Г.К. Касымова^{1*}, Сәдібеков², 2025.**

¹Абай атындағы Қазақ ұлттық педагогикалық университеті,
Алматы, Қазақстан;

²Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті,
Түркістан, Қазақстан.

*E-mail: zhaina.kassym@gmail.com

ЦИФРЛЫҚ ДӘУІРДЕ БІЛІМ БЕРУ АРҚЫЛЫ ҰЛТТЫҚ САНАНЫ ҚАЛЫПТАСТЫРУҒА ШОЛУ

Утеева К.Ж. — лектор, Абай атындағы Қазақ ұлттық педагогикалық университеті, Алматы, Қазақстан,

E-mail: uteeva.kundyz@mail.ru, ORCID ID: <https://orcid.org/0009-0009-8947-4918>;

Касымова Г.К. — философия докторы (PhD), Лектор, Абай атындағы Қазақ ұлттық педагогикалық университеті, Алматы, Қазақстан,

E-mail: zhaina.kassym@gmail.com, ORCID ID: <https://orcid.org/0000-0001-7004-3864>;

Сәдібеков А.К. — философия докторы (PhD), Лектор, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан, Қазақстан,

E-mail: askat.sadibekov@ayu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-6567-436X>.

Аннотация. Бұл мақалада 2009-2025 жылдар аралығындағы білім беру саласындағы ғылыми жарияланымдар мен конференция материалдарына библиометриялық талдау жүргізу арқылы цифрлық дәуірде білім беру арқылы ұлттық сананы қалыптастыру мәселелері жан-жақты қарастырылған. Зерттеу барысында Қожа Ахмет Яссауидің рухани мұрасы мен ұлттық сана, әл-Фарабидің философиялық идеялары мен ұлттық код, Абай Құнанбаевтың ойлары және жастардың патриоттық тәрбиесіндегі рөлі терең философиялық тұрғыдан қарастырылды. Авторлар Қазақстанның тәуелсіздік алғаннан кейінгі кезеңінде ұлттық сана мен патриотизмнің қалыптасу динамикасын зерттеп, білім берудің осы процестегі орны мен ықпалын нақтылай түседі. Сонымен қатар, виртуалды шындық, жасанды интеллект, иммерсивті мәдени тәжірибе, цифрлық платформалар мен білім беру контенті сияқты жаңа технологиялардың жастардың бойында ұлттық сананы қалыптастырудағы әлеуеті талданды. Бұл технологиялардың көмегімен білім алушыларға тарихи-мәдени мұраны жаңаша қырынан таныстыру, интерактивті білім беру ортасын қалыптастыру және патриоттық құндылықтарды тиімді жеткізу мүмкіндіктері ашылады. Зерттеу нәтижелері цифрлық технологияларды тиімді қолдану ұлттық құндылықтарды жаңғыртуға, мәдени кодты сақтауға және жаһандану жағдайында жастардың мәдени сәйкестігін нығайтуға елеулі ықпал ететінін

көрсетті. Жаһандық ғылыми ортада патриотизм, ұлттық бірегейлік және білімді ықпалдастыру әдістеріне ерекше назар аударылады. Жетекші журналдар мен конференция материалдарының мазмұнын талдау ұлттық болмысты сақтауға бағытталған инновациялық тәсілдерді айқындауға мүмкіндік берді. Мақала көпмәдениетті, цифрлық қоғамда қызмет ететін педагогтар мен саясаткерлерге жастардың ұлттық санасын дамытуда практикалық ұсыныстар береді. Сонымен бірге, зерттеу нәтижелері білім беру жүйесіне цифрлық технологияларды интеграциялау арқылы ұлттық сананы сақтаудың негізін ұсынады.

Түйін сөздер: ұлттық сана, ұлттық болмыс, VR технологиясы, тіл, мұғалім, оқыту

©К.Ж. Утеева¹, Г.К. Касымова^{1*}, А.К. Садібеков², 2025.

¹Казахский национальный педагогический университет им. Абая,
Алматы, Казахстан;

²Международный казахско-турецкий университет имени Ходжи Ахмеда
Ясави, Туркестан, Казахстан.

E-mail: zhaina.kassym@gmail.com

ОБЗОР ФОРМИРОВАНИЯ НАЦИОНАЛЬНОЙ ИДЕНТИЧНОСТИ ПОСРЕДСТВОМ ОБРАЗОВАНИЯ В ЦИФРОВУЮ ЭПОХУ

Утеева К.Ж. — преподаватель, Казахский национальный педагогический университет им. Абая, Алматы, Казахстан,

E-mail: uteeva.kundyz@mail.ru, ORCID ID: <https://orcid.org/0009-0009-8947-4918>;

Касымова Г.К. — PhD, Казахский национальный педагогический университет им. Абая, Алматы, Казахстан,

E-mail: zhaina.kassym@gmail.com, ORCID ID: <https://orcid.org/0000-0001-7004-3864>;

Садібеков А.К. — PhD, Международный казахско-турецкий университет имени Ходжи Ахмеда Ясави, Туркестан, Казахстан,

E-mail: askat.sadibekov@ayu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-6567-436X>.

Аннотация. В данной статье всесторонне рассматриваются вопросы формирования национального сознания посредством образования в цифровую эпоху путем проведения библиометрического анализа научных публикаций и материалов конференций в области образования за период с 2009 по 2025 год. В ходе исследования духовное наследие и национальное сознание Ходжи Ахмета Ясави, философские идеи Аль-Фараби и национальный кодекс, мысли Абая Кунанбаева и их роль в патриотическом воспитании молодежи были рассмотрены с глубокой философской точки зрения. Авторы изучают динамику формирования национального сознания и патриотизма в период после обретения независимости Казахстана и выясняют роль и влияние образования в этом процессе. Кроме того, был проанализирован потенциал новых технологий, таких как виртуальная реальность, искусственный интеллект, иммерсивный культурный опыт, цифровые платформы и образовательный контент в формировании национального сознания у молодежи. С помощью этих

технологий открываются возможности для учащихся по-новому ознакомиться с историко-культурным наследием, создать интерактивную образовательную среду и эффективно передать патриотические ценности. Результаты исследования показали, что эффективное использование цифровых технологий оказывает существенное влияние на обновление национальных ценностей, сохранение культурного кода и укрепление культурной идентичности молодежи в условиях глобализации. В мировой научной среде особое внимание уделяется методам интеграции патриотизма, национальной идентичности и знаний. Анализ содержания ведущих журналов и материалов конференций позволил выявить инновационные подходы, направленные на сохранение национальной идентичности. В статье даны практические рекомендации для педагогов и политиков, работающих в поликультурном цифровом обществе, по развитию национального самосознания молодежи. Одновременно результаты исследования создают основу для сохранения национального самосознания посредством интеграции цифровых технологий в систему образования.

Ключевые слова: национальное сознание, национальная идентичность, технология VR, язык, педагоги, преподавание

Introduction. National consciousness is one of the important values that form the spiritual foundation of humanity (Carretero & Kriger, 2011). It means that each person deeply feels and respects the culture, language, history, traditions, and customs of his nation. The formation of national consciousness in modern youth will undoubtedly have a great impact on their development as individuals, their place in society, and the development of our country in the future. Factors such as history, literature, music, philosophy and culture greatly influence the formation of Kazakhstan's national consciousness. Today, along with the development of society, young people's views are also changing. Although global information flows and the influence of different cultures have expanded young people's worldviews, there is a danger of losing our national values. Therefore, the role of schools, teachers, and parents in the formation of adolescents' national consciousness is very important. They should correctly convey to children the history, culture, and traditions of their people and contribute to the formation of national identity.

The formation of national consciousness is not only the acquisition of the national language and culture but also the development of a sense of pride and respect for one's native land, the Motherland. A person with a developed national consciousness strives to continue the traditions of his nation and preserve its cultural heritage. These qualities should be instilled in every person from an early age and become their life principles. In the formation of national consciousness among schoolchildren, it is first of all very important to provide them with knowledge about the history and culture of the nation. By introducing students to the history of Kazakhstan and the life path of our great personalities, it is possible to increase their love for their homeland. In addition, glorifying the traditions and customs of the people, teaching national songs and dances, and promoting the literature and art of the nation are effective ways to form national consciousness.

Language is also of great importance in the process of developing national consciousness (Uteeva et al., 2023). Bond (2019) studied international students and focused on identity studies alongside the language and culture of academic contexts, students developed an understanding of, and reflexivity around. Because language is the foundation of national culture, through which the identity of the nation, its system of thought, worldview, and the development of the people are formed (Qoyyimah et al., 2020). By helping children master their native language and understand the depth of the language, their respect for the nation and a sense of patriotism are strengthened. In this context, it is possible to raise national consciousness by mastering the Kazakh language and delving deeply into its rich vocabulary and deep meaning. Parents also play a special role in the upbringing of national consciousness. Parents should provide their children with national education in their families, teach them the customs and traditions of the people, and provide information related to Kazakh education and culture. Close ties between family and school are very important in instilling patriotism in the younger generation. If a child learns to respect national values at home, he will be able to develop these qualities at school as well. This study examines the main studies and their results that have contributed to the formation of national consciousness and analyzes their contribution to the development of national values in the field of education. In recent years, the issue of forming national identity in the field of education has become an important focus of the scientific community. In particular, the introduction of modern technologies such as virtual reality (VR) tools into education (Urazaliyeva, Bekalaeva and Kassymova, 2024), teaching process allows us to consider new ways of influencing the national consciousness of young people. Through VR tools, students can interactively perceive historical information, national heroes or cultural monuments and establish an emotional connection to the motherland. In the historical context of Kazakhstan, the study of the issue of national identity has been relevant since the period of independence.

Khoja Akhmet Yassawi and National Consciousness: Khoja Akhmet Yasawi's book "Diwani Hikmet" has a special influence on the formation and development of national consciousness. Yasawi's works contain ideas aimed at strengthening national consciousness through the promotion of morality, justice, mercy, and national ideals. Islamic education and Sufi ideas form the basis of national spirituality, which contributes to the formation of national consciousness (Turysbek, 2023).

Al-Farabi and the national code: Al-Farabi's philosophical heritage, especially anthropological ethics, plays an important role in the formation of the national code of the Kazakh people. His concept of "happiness", the anthropocentric nature of the human character, determines the foundations of national consciousness (Raev, 2021). Al-Farabi's ideas play an important role in the formation of the national consciousness of young people, through the development of the foundations of national spirituality and moral values.

Youth and patriotic education: Patriotic education of adolescents is the basis for the formation of national consciousness. Patriotism, through national consciousness and sympathy for the nation, contributes to the formation of young people as

conscious citizens (Baikulova & Yelubayeva, 2022). In Kazakhstan, patriotism is formed through the love and respect of each citizen for his country, his homeland, this process plays an important role in the development of the national consciousness of young people.

The role of Abai Kunanbayev: Abai Kunanbayev's creativity occupies a special place in the formation of national consciousness. The concept of character in his poems, the importance of man, mind, knowledge, and good character play an important role in the formation of national values (Sargeltayeva & Ybyraikyzy, 2023). By teaching Abai's work, the ideas of virtue will take on an important place in the minds of young people, and their role in developing national values will increase (Kertayeva & Magauova, 2021). Nowadays, virtual reality technology (VR) has emerged as a powerful instrument that can impact the formation and expression of national identity. Digital technologies have become integrated into our daily lives, and the younger generation has been compelled to construct new, multifaceted identities for themselves within virtual environments (Şimşek & Şimşek, 2014). This dynamic led to a blurring of the boundaries between the physical and digital worlds, enabling users (which also include the young generation) to explore and experiment with their identity in ways that may not be possible in the physical world. Some researchers argue that this is incorrect; however, with proper guidance, VR technology may benefit the formation of a national identity in youth.

VR can help develop national identity in students by creating immersive experiences that can enhance cultural awareness, historical understanding, and acceptance and by providing emotional connections to national heritage, thus contributing to the formation of national identity (Jiang, 2023; McGivney, 2019; Babri, 2025). For instance, VR can simulate historical events, momentous landmarks, museums, and monuments, and it can even recreate iconic national symbols. Thus, allowing students to experience their nation's past virtually can create a sense of pride and belongingness to their culture. Moreover, students may acquire a deeper appreciation for their history and cultural traditions and develop a stronger visual and emotional connection to their homeland. (Nair, 2021; Vesisenaho et al., 2019; Dobrova et al., 2019).

VR-supported language learning can incorporate cultural elements, which helps students connect with national traditions, customs, and folklore. Additionally, VR can enhance exploring a nation's linguistic and cultural diversity, fostering cross-cultural understanding and appreciation (Dobrova et al., 2019; Nair, 2021). It can also provide interactive experiences that immerse users in the customs, traditions, and daily lives of various cultural groups within a nation. By nurturing emotional connections and hands-on engagement, VR can develop a more nuanced and inclusive understanding of national identity.

Students living abroad or immigrants often encounter challenges related to their racial and cultural identities. They struggle to balance their ethnic heritage with the dominant culture, which can lead to increased mental health issues. Virtual reality (VR) can act as a bridge to their homeland, helping to cultivate a sense of belonging

and connection. VR-based narratives can emotionally engage students with stories of national struggles, achievements, and cultural evolution.

Thus, VR has the potential to form a national identity. Moreover, some educational institutions have already started their utilization. For example, Eileen McGivney taught a course titled ‘The Virtual Self: Identity, Culture, and Learning in Digital Worlds’ at Harvard University (2020). Where students studied how virtual environments can be a powerful tool for learning, and drawing on sociocultural learning theories to understand how these experiences both shape and are shaped by cultural, gender, racial, and professional identities. Another course, “Virtualizing Cultures (Cultures 3.0),” merged digital technology with cultural studies envisioned by Jung-Hsien Lin, director of the VR Lab for Global Languages & Cultures at UCI’s School of Humanities. While students develop technical skills, the course remains grounded in fundamental humanities questions, using extended reality (XR) technologies to examine how cultures manifest and evolve in virtual spaces. With the help of virtual tours and interactive simulations, students explored cultural representation and identity formation beyond the boundaries of the physical classroom.

Materials and methods of research. This study employed a quantitative approach to analyze publications related to national identity in education, such as journal articles, books, and conference papers, from 2009 to 2025. The study aims to examine the trends, geographic orientation, and evolution of the concepts of national consciousness and national identity in educational research and also to study in more depth the relationship between education and national consciousness by conducting a bibliometric analysis of scientific works published on the topic of education and national identity for the period 2009-2025. The research tools are citation databases such as Clarivate Analytics (Web of Science), Google Scholar, ResearchGate articles, and bibliometric software such as RStudio, ChatGPT and BibExcel. The study provides a comprehensive understanding of how national consciousness and national identity are formed in the context of education, how they develop, and how they affect adolescents.

Research results and discussions. Formation of national consciousness is not limited to national borders; it is closely related to the general spiritual values of society. Each person learns to understand the world and find their place in society based on their national culture; the promotion of ‘national values’ within the history curriculum has become an increasingly topical issue in the wake of recent debates about ‘Britishness’ and community cohesion in England. (Andrews, McGlynn, Mycock, 2009). National consciousness is an important orientation not only to the past but also to the future. It gives young people the necessary strength to contribute to the development of our country and to find their place in the world community. Ortega-Sánchez, Pagès Blanch, Pérez-González (2020) analyzed the national identity and suggested some ideas for the search for a balance of teaching and learning. The results of this study indicate that the topic of developing and shaping national consciousness in students is an active but somewhat declining field of research. The number of scholars who have studied it is small at the global level. While some

research has involved international collaboration, most of the work is still relatively isolated to specific national contexts. The documents themselves are mainly research articles and indicate that the field is still developing, but is being studied at a slow pace.

Table 1 shows the extent of research on national identity and its teaching in the Web of Science database, covering almost two decades. The research sources were collected from 48 different sources, including academic journals, books, conference proceedings, and other scholarly works, including research on national identity teaching and related pedagogy. Over the past 20 years, research on teaching national identity to students has been reported in 50 documents in the Web of Science database. The annual growth rate is -6.64%; this indicates a decrease in the number of publications related to national identity teaching, which means that fewer new articles and studies are being published in this specific area (Figure 1). The average age of the document is 5.56 years: this means that the average document in the dataset is relatively recent, with most studies published in the last 6 years or more. This suggests that national identity teaching is still a developing or active area of interest.

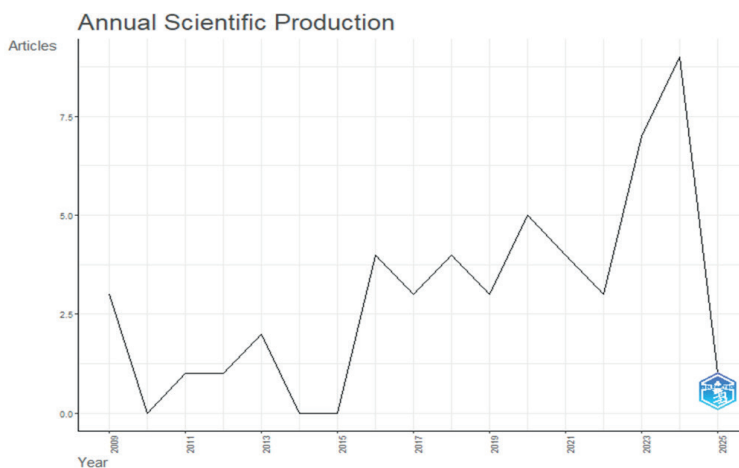


Figure 1. Annual scientific production

Figure 2 shows the main elements of citations per year; there are relatively high citations per article from 2009 to 2018, with a peak in 2018 in terms of average citations per article (29) and average citations per year (3.62). Citations generally decrease in 2019, with a sharp drop towards 2025, indicating fewer publications or new articles that have not yet been cited. This is because the authors of this study extracted data from Clarivate Analytics (Web of Science) on February 3, 2025, using RStudio. On average, each document was cited about 6-7 times, which makes it clear that although the topic may be specialized, it still has some scholarly impact (Table 1). Overall, research findings on this topic indicate that citations and publications have been declining, especially in recent years.

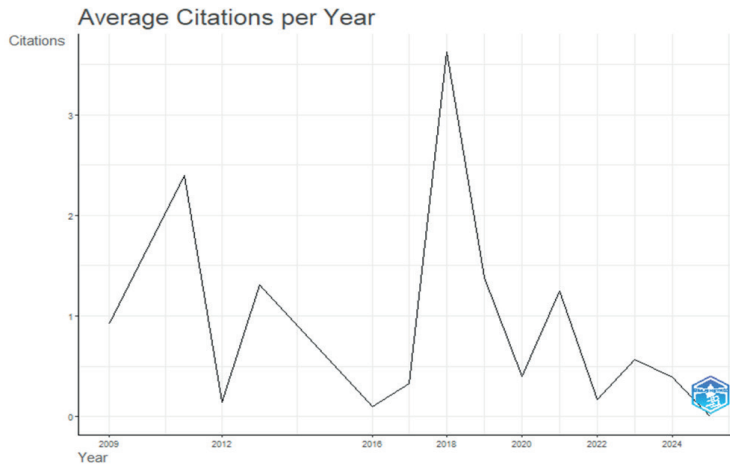


Figure 2. Average citation per year

The document content is characterized by the meaning of various relevant keywords or phrases (e.g., national identity, national sentiment, pedagogy, education, etc.) associated with the research documents. This reflects the wide range of topics and concepts related to national identity and its importance in teaching to learners. 149 authors and co-authors contributed to the 50 papers. This may indicate a fair amount of collaboration in this area of research. Some of them (17 single authors) worked independently on their articles, which suggests that some of the research on national consciousness is individual. Furthermore, the number of international co-authors is 16 %, which means that teaching national identity is a local or national issue, but there is still some international involvement (Table 1).

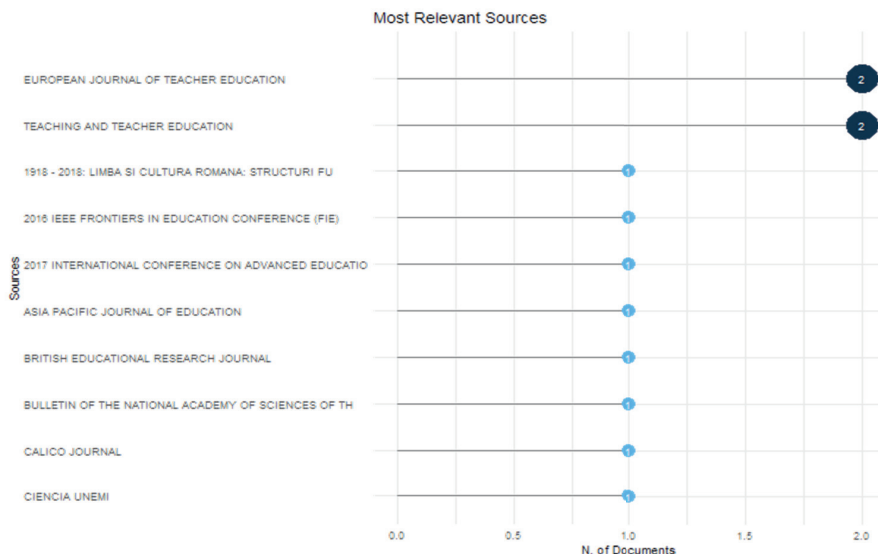


Figure 3. The most relevant sources

Most of the documents (37 out of 50) are likely to be research papers focusing on various aspects of teaching our national values in various educational institutions. Figure 3 shows the sources (journals, conferences, publications) where articles have been published related to each person's deep awareness and respect for the culture, language, history, traditions, and customs of their nation. The number next to each source indicates how many articles have been published in a particular journal or place as below:

- The European Journal of Teacher Education and Teaching and Teacher Education are the most frequent sources, with 2 articles each.
- Many other sources are less frequent, with only 1 article published in each, covering a wide variety of journals and conferences, from general education and psychology journals such as Asia Pacific Journal of Education, and Higher Education) to more specialized topics like the Journal of Language Identity and Education and Journal of Youth and Adolescence.
- The list also includes conference proceedings, for example, Proceedings of the Annual Civic Education Conference and specialized academic forums related to education and teacher training.

These various sources show that research on teaching in the process of developing national consciousness covers various educational fields and is also presented in conference proceedings. Early Access (3 articles) are the latest, published online before being published in print, which means ongoing research or cutting-edge research. The international conference proceedings consist of 9 articles and are taken from academic conferences or symposia that may offer new ideas or methodologies related to the development of national consciousness. In addition, there is 1 review article that is a comprehensive synthesis of research on the education of national identity (Table 1).

Table 1. Data on research documents published from 2009 to 2025 in Web of Science

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2009:2025
Sources (Journals, Books, etc)	48
Documents	50
Annual Growth Rate %	-6.64
Document Average Age	5.56
Average citations per doc	6.7
References	0
DOCUMENT CONTENTS	
Keywords Plus (ID)	111
Author's Keywords (DE)	218
AUTHORS	
Authors	132
Authors of single-authored docs	17
AUTHORS COLLABORATION	
Single-authored docs	17

Co-Authors per Doc	2.7
International co-authorships %	16
DOCUMENT TYPES	
article	37
article; early access	3
proceedings paper	9
review	1

Table 2 presents some bibliometric indicators for various journals and conferences related to education in the field of national consciousness education. H_index represents the number of publications that have been cited at least h times. For example, the Asia Pacific Journal of Education has an h-index of 1, meaning it has at least one article that has been cited once or more. G_index is similar to the h-index but gives more weight to highly cited articles. Asia Pacific Journal of Education also has a g-index of 1, suggesting limited highly-cited work in this area. PY_start is the starting year of publications for that journal or conference. For example, the Asia Pacific Journal of Education started publishing relevant articles in 2009. TC (Total Citations) is the total number of citations for all articles published by the journal or conference. For example, the Asia Pacific Journal of Education has a total of 6 citations across all its articles in this dataset. NP (Number of Publications) is several articles published in this dataset for each source. Most sources have one article, but some journals, like the European Journal of Teacher Education, have 2. M_index is a normalized metric that considers the number of publications and their citations. It shows the average citations per publication in a journal over time.

Table 2. Sources' Local Impact by H index on national identity in teaching

Element	h_index	g_index	PY_start	TC	NP	m_index
Asia pacific journal of education	1	1	2009	6	1	0,05882353
British educational research journal	1	1	2018	18	1	0,125
Calico journal	1	1	2021	8	1	0,2
Compare-a journal of Comparative and international education	1	1	2012	2	1	0,07142857
Culture \& psychology	1	1	2011	36	1	0,06666667
Education sciences	1	1	2020	1	1	0,16666667
Educational research	1	1	2009	14	1	0,05882353
European journal of social work	1	1	2017	5	1	0,11111111
European journal of teacher education	1	2	2021	11	2	0,2
Frontiers in Public Health	1	1	2024	1	1	0,5
Heliyon	1	1	2024	3	1	0,5
Higher education	1	1	2018	8	1	0,125
Ifte 2017 - 3rd international forum on teacher education	1	1	2017	4	1	0,11111111
International journal of inclusive education	1	1	2023	1	1	0,33333333
International journal of stem education	1	1	2018	90	1	0,125
Journal for research in mathematics education	1	1	2021	6	1	0,2

Journal of Curriculum Studies	1	1	2020	5	1	0,16666667
Journal of language identity and education	1	1	2023	10	1	0,33333333
Journal of Microbiology \& biology education	1	1	2023	1	1	0,33333333
Journal of research in science teaching	1	1	2024	1	1	0,5
Journal of youth and adolescence	1	1	2019	16	1	0,14285714
Revista de educacion	1	1	2016	4	1	0,1
Ride-the journal of applied theatre and performance	1	1	2009	27	1	0,05882353
School science and mathematics	1	1	2020	6	1	0,16666667
Sociological research online	1	1	2013	34	1	0,07692308
South African journal of higher education	1	1	2022	1	1	0,25
Teaching and learning in nursing	1	1	2022	1	1	0,25
Teaching and teacher education	1	1	2024	1	2	0,5
Teaching in higher education	1	1	2019	13	1	0,14285714
Trans-form-acao	1	1	2024	1	1	0,5

We can observe key elements from Table 2 that many journals have low citation counts, for instance, the *Asia Pacific Journal of Education* with 6 citations; which means that the research is still emerging or specialized. Some journals, like the *International Journal of STEM Education* and the *Journal of Youth and Adolescence*, have higher citation counts but still modest impact in terms of citations per article. Journals that have been published for a longer time, such as the *Asia Pacific Journal of Education*, which started publishing in 2009, show more established citation patterns, but many are newer, for example, *Frontiers in Public Health* in 2024. Overall, these data indicate that research on national identity in education and the formation of national consciousness in the younger generation is widespread, most of which shows modest reference figures, but interest has been growing in recent years.

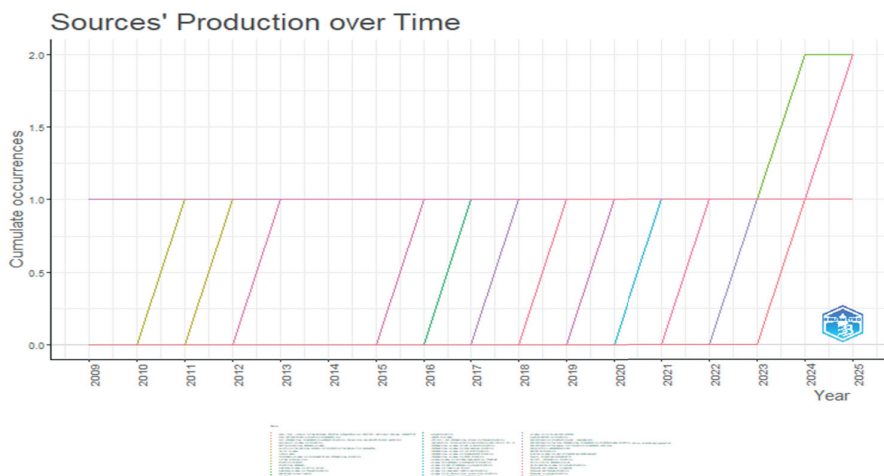


Figure 4. Sources' Production over Time

Figure 4 presents the number of articles published in various academic journals and conferences in the field of education from 2009 to 2025, especially related to the teaching of national identity and our national values. The data shows a growing trend in publications, especially after 2016, which indicates an increased interest in the field of education in the last decade due to the threat of losing national identity and our national values. Current globalization leads educators to redesign and negotiate their academic curriculum because of key aspects of managing the national labor market and encourages them to teach work identity (Ennerberg & Economou, 2020).

Figure 5 shows the frequency of countries where the teaching of national identity and national consciousness to young people is a significant topic in educational research or practice, reflecting the diverse global interest in the formation of national consciousness among students. The emphasis on the education of national identity in these countries reflects the different cultural, political, and educational priorities associated with the development of students' patriotism, cultural understanding, and national pride. For example, for China, China's rich history, vast cultural diversity, and the importance of national unity, national identity, and consciousness are of great importance. In contrast, national identity in the United States (29 publications) often focuses on values such as democracy, individual freedoms, and multiculturalism, along with patriotism. In these countries, teaching national identity and national consciousness often involves fostering a sense of pride in the nation's history, showing respect for national symbols - such as flags or anthems - and promoting values related to citizenship, patriotism and cultural understanding. This develops national consciousness in children and educates them to respect the culture, traditions, history and language of the nation. Through the joint work of the school and parents, measures are implemented to instil national values in children and develop a love for the Motherland and patriotism.

Region	Freq
China	33
Usa	29
Uk	16
Spain	9
Israel	6
Australia	5
Hungary	4
Indonesia	4
Russia	4
South Africa	4
Chile	3
Jordan	3
Pakistan	3
Peru	3
Sweden	3
Georgia	2
Iran	2
Kazakhstan	2
Malaysia	2
Romania	2
Singapore	2
South Korea	2
Argentina	1
Mexico	1
Netherlands	1
Saudi Arabia	1

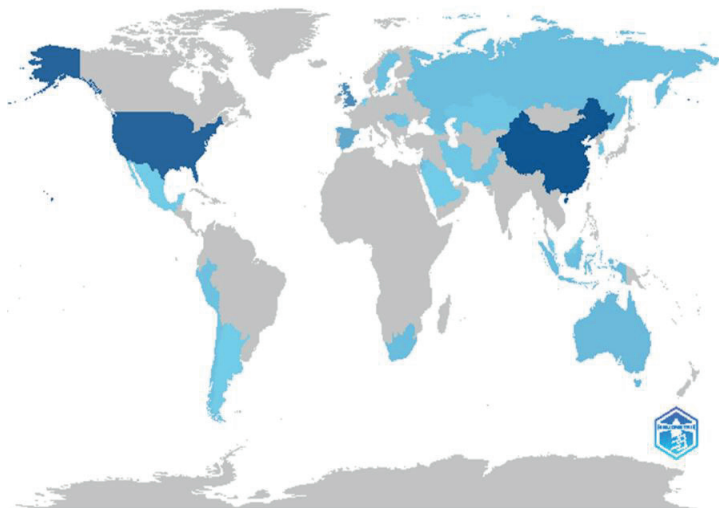


Figure 5. Country Scientific Production

Since national identity is a spiritual phenomenon formed through the historical memory, language, soul and cultural heritage of the people, the formation of this

concept in the case of Kazakhstan is closely related to the country's independence. Most of the educational reforms carried out since 1991 are aimed at reviving national values, instilling a sense of historical responsibility and patriotism in young people. In this context, the study pays special attention to schoolchildren and students. During the teaching process, teachers are encouraged to educate the young generation about our national consciousness because they are considered to be the foundation of the country's future. The level of national identity and patriotism among young people is an important indicator of the country's cultural stability and security.

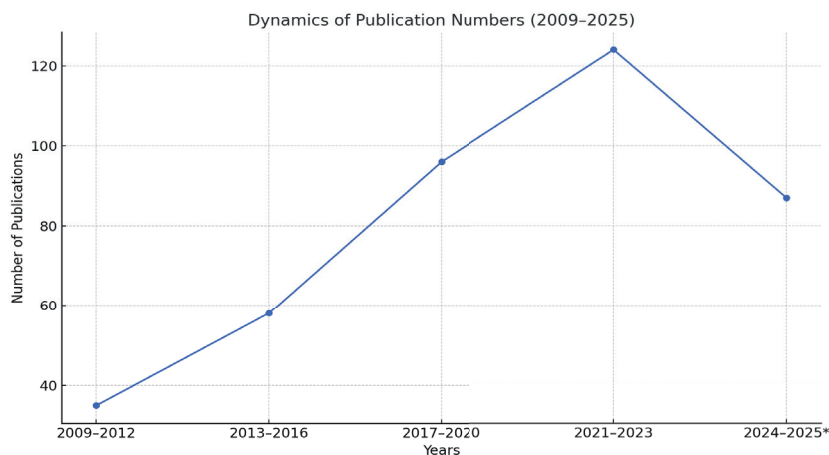


Figure 6. Dynamics of Publication about VR in education between 2009–2025 from educational academic journals

**Note that Figure 6 shows the number of publications in different years between 2009 and 2025, covering sources up to June of the current year (2025).*

In recent years, the use of virtual technologies, including virtual reality, in the educational process has had a profound impact on the content of education (Urazaliyeva, Bekalaeva and Kassymova, 2024), and researchers are actively publishing research results on the VR in education over the last decades (see Figure 6). Through VR tools, students can interactively perceive historical events, national heroes or cultural monuments and establish an emotional connection. This is not only an effective means of education, but also of educating national consciousness. The results of the study revealed the modern features of the relationship between education and national consciousness. The introduction of virtual reality technologies into the educational process is considered not only a pedagogical innovation but also a modern way to strengthen national identity. In addition, it shows that since the period of independence, the role of education in the formation of the national consciousness of young people has been increasing.

Conclusions. National consciousness is one of the important values that form the spiritual foundation of humanity. The heritage of Yassawi, Al-Farabi, and Abai plays a great role in forming Kazakhstan's national consciousness. Patriotic education of

young people, preservation of national culture, and spiritual revival are the main directions in the development of national consciousness. Considering the successful integration of virtual reality into the learning process by scientists and educators from other countries, and the lack of work in this area in our country, it has been suggested that national identity formation in youth needs further investigation.

To sum up, the formation of national consciousness in adolescents is one of the most important tasks of our time. This process is a strategic step aimed at preserving and developing the spiritual wealth of society. In this study, the authors draw attention to the increasing number of scholarly contributions over the years to various journals and conferences that demonstrate a broader and more sustained interest in topics such as teaching cultural value, national identity, issues of national consciousness and its process of developing in education. The ability to form national consciousness at a high level is a powerful tool that will allow future generations to appreciate their national culture and work towards its development. Thus, it is necessary to educate individuals who are proud of their history, culture, and language, and who will contribute to the development of our country. In the context of globalization, conveying national values to the younger generation living in a multicultural environment is one of the main tasks of the education sector. In this regard, the results of the study will serve as a basis for providing specific directions to education policymakers, teachers and researchers.

The above studies highlight the importance of philosophical, literary, cultural, and spiritual heritage in the formation of national consciousness. However, the impact of modern technologies, social media, and the Internet on the development of national consciousness among young people has not been fully studied. Conducting new research in this area will allow us to identify new factors that influence the formation of national consciousness.

Литература

Andrews R., McGlynn C., & Mycock A. (2009) Students' attitudes towards history: does self-identity matter? *Educational Research*, 51(3). — P. 365–377. <https://doi.org/10.1080/00131880903156948>

Babri N., (2025) Bringing cultural studies into the virtual world. *UCI Humanities*. University of California, Irvine. Retrieved from <https://www.humanities.uci.edu>

Байкулова А., Елубаева Р. Жеткіншектерге психологиялық және патриоттық тәрбие берудің маңыздылығы. Абай атындағы ҚазҰПУ Хабаршысы. Психология сериясы. — P. 72 <https://doi.org/10.51889/6231.2022.77.71.023>

Bond B. (2019) International students: language, culture and the 'performance of identity.' *Teaching in Higher Education*, 24(5). — P. 649–665. <https://doi.org/10.1080/13562517.2019.1593129>

Carretero M., & Kriger M. (2011) Historical representations and conflicts about indigenous people as national identities. *Culture & Psychology*, 17(2). — P. 177-195. <https://doi.org/10.1177/1354067X11398311>

Dobrova V.V., Labzina P.G., Ageenko N., & Menshenina S.G. (2019) Language Education in the Age of Globalization and Innovation. In *SHS Web of Conferences* (Vol. 71. — P. 5010). EDP Sciences. <https://doi.org/10.1051/shsconf/20197105010>

Ennerberg E., & Economou C. (2020) Migrant teachers and the negotiation of a (new) teaching identity. *European Journal of Teacher Education*, 44(4). — P. 587–600. <https://doi.org/10.1080/02619768.2020.1788536>

Jiang J. (2023) Exponenself: Exploring and strengthening cultural identity from virtual reality

to reality. In Proceedings of the 9th International Conference of the Immersive Learning Research Network (iLRN 2023). Immersive Learning Research Network. <https://doi.org/10.56198/ZH3JOSNEY>

Kertayeva G.M., Magauova A.S. (2021) Adam sanasin rxwxanı jañgırtwğa qatisti abaydıñ aqılı [Abai's advice on the spiritual revival of human consciousness]. Bulletin of Toraighyrov University. Pedagogics series. Issue 1. — P. 237-245. <http://doi.org/10.48081/BFIV8111>

McGivney E. (2019) The Virtual Self: Identity, Culture, and Learning in Digital Worlds. Harvard University.

Nair A. (2021) A Brief Study on Virtual Reality. In International Journal for Research in Applied Science and Engineering Technology (Vol. 9, Issue 4. — P. 665). International Journal for Research in Applied Science and Engineering Technology (IJRASET). <https://doi.org/10.22214/ijraset.2021.33664>

Ortega-Sánchez D., Pagès Blanch J., & Pérez-González C. (2020) Emotions and Construction of National Identities in Historical Education. Education Sciences, 10(11). — P. 322. <https://doi.org/10.3390/educsci10110322>

Qoymimah U., Singh P., Exley B., Doherty C., & Agustian Y. (2020) Professional Identity and Imagined Student Identity of EIL Teachers in Islamic Schools. Journal of Language, Identity & Education, 22(2). — P. 121–136. <https://doi.org/10.1080/15348458.2020.1833726>

Раев Д.С. (2021) Әл-Фараби іліміндегі антропологиялық этикасофия. Аль-Фараби, 73(1). <https://doi.org/10.48010/2021.1/1999-5911.01>

Саргелтаева А.Қ., Ыбырайқызы Г. (2023) Абай өлендерінде кездесетін әртүрлі мінез көріністері. Керуен. — №1, 78-том. — P. 123-133. <http://doi.org/10.53871/2078-8134.2023.1-11>

Şimşek A., & Şimşek E. (2014) Transformation of Identities in the Mediated Landscape of the Network Society. Online Journal of Communication and Media Technologies (Vol. 4, Issue 4). <https://doi.org/10.29333/ojcm/2491>

Турысбек Р.С. (2023) Қожа Ахмет Ясауи хикметтеріндегі адамдық мұрат пен имандылық негіздері. Л.Н. Гумилев атындағы Еуразия ұлттық университетінің Хабаршысы. Филология сериясы, 142(1). — P. 134–145. <https://doi.org/10.32523/2616-678X-2023-142-1-134-145>

Уразалиева У., Бекалаева А.О., Касымова Г. (2024) Обучение через виртуальную реальность: результаты пилотного исследования английского языка. Вестник Евразийского Гуманитарного Института, (3). — P. 235-247. <https://doi.org/10.55808/1999-4214.2024-3.22>

Uteeva K.Zh., Zharmagambetova A.S., Kassymova, G. (2023) Teaching significance of preserving national identity in intercultural communication in the global world. Scientific Journal «Bulletin of NAS RK», 403(3). — P. 257-266. <https://doi.org/10.32014/2023.2518-1467.507>

Vesisenaho M., Juntunen M., Häkkinen P., Pöysä-Tarhonen J., Fagerlund J., Miakush I., & Parviainen T. (2019) Virtual Reality in Education: Focus on the Role of Emotions and Physiological Reactivity. Journal of Virtual Worlds Research (Vol. 12, Issue 1). <https://doi.org/10.4101/jvwr.v12i1.7329>

References

Andrews R., McGlynn C., & Mycock A. (2009) Students' attitudes towards history: does self-identity matter? Educational Research, 51(3). — P. 365–377. <https://doi.org/10.1080/00131880903156948> (in Eng.).

Babri N., (2025) Bringing cultural studies into the virtual world. UCI Humanities. University of California, Irvine. Retrieved from <https://www.humanities.uci.edu> (in Eng.).

Baikulova A.M., Yelubayeva R.S. (2022) Jetкінсектерге психологиялық патриоттық тәрбие берудің маңизділігі [The importance of psychological and patriotic education of adolescents]. Bulletin of Abai KazNPU. Series of Psychology. — P. 727 <https://doi.org/10.51889/6231.2022.77.71.023> (in Kaz.).

Bond B. (2019) International students: language, culture and the 'performance of identity.' Teaching in Higher Education, 24(5). — P. 649–665. <https://doi.org/10.1080/13562517.2019.1593129> (in Eng.).

Carretero M., & Kriger M. (2011) Historical representations and conflicts about indigenous people as national identities. Culture & Psychology, 17(2). — P. 177-195. <https://doi.org/10.1177/1354067X11398311> (in Eng.).

Dobrova V.V., Labzina P.G., Ageenko N., & Menshenina S.G. (2019) Language Education in the Age of Globalization and Innovation. In SHS Web of Conferences (Vol. 71. — P. 5010). EDP Sciences. <https://doi.org/10.1051/shsconf/20197105010> (in Eng.).

Ennerberg E., & Economou C. (2020) Migrant teachers and the negotiation of a (new) teaching

identity. *European Journal of Teacher Education*, 44(4). — P. 587–600. <https://doi.org/10.1080/02619768.2020.1788536> (in Eng.).

Jiang J. (2023) Exponself: Exploring and strengthening cultural identity from virtual reality to reality. In *Proceedings of the 9th International Conference of the Immersive Learning Research Network (iLRN 2023)*. Immersive Learning Research Network. <https://doi.org/10.56198/ZH3JOSNEY> (in Eng.).

Kertayeva G.M., Magauova A.S. (2021) Adam sanasin rxwxanı jañğırtwğa qatisti abaydıñ aqılı [Abai's advice on the spiritual revival of human consciousness]. *Bulletin of Toraighyrov University. Pedagogics series*. Issue 1. — P. 237-245. <http://doi.org/10.48081/BFIV8111> (in Eng.).

McGivney E. (2019) *The Virtual Self: Identity, Culture, and Learning in Digital Worlds*. Harvard University. (in Eng.).

Nair A. (2021) A Brief Study on Virtual Reality. In *International Journal for Research in Applied Science and Engineering Technology* (Vol. 9, Issue 4). — P. 665). *International Journal for Research in Applied Science and Engineering Technology (IJRASET)*. <https://doi.org/10.22214/ijraset.2021.33664> (in Eng.).

Ortega-Sánchez D., Pagès Blanch J., & Pérez-González C. (2020) Emotions and Construction of National Identities in Historical Education. *Education Sciences*, 10(11). — P. 322. <https://doi.org/10.3390/educsci10110322> (in Eng.).

Qoyyimah U., Singh P., Exley B., Doherty C., & Agustawan Y. (2020) Professional Identity and Imagined Student Identity of EIL Teachers in Islamic Schools. *Journal of Language, Identity & Education*, 22(2). — P. 121–136. <https://doi.org/10.1080/15348458.2020.1833726> (in Eng.).

Raev D.S. (2021) Äl-farabı ilimindegi antropologiyalıq étikasofiya [Anthropological Ethicasophy in the Teachings of Al-Farabi]. *Al-Farabi*, 73(1). — P. 3-17. <http://doi.org/10.48010/2021.1/1999-5911.01>(in Kaz.).

Sargeltayeva A.K., Ybyraikyzy G. (2023) Abay öleñderinde kezdesetin ärtürli minez körinisteri [The concept of character (behavior) in the poems of Abay]. *Keruen*, Vol. 78, Issue 1. — P. 123-133. <http://doi.org/10.53871/2078-8134.2023.1-11>(in Kaz.).

Şimşek A., & Şimşek E. (2014) Transformation of Identities in the Mediated Landscape of the Network Society. *Online Journal of Communication and Media Technologies* (Vol. 4, Issue 4). <https://doi.org/10.29333/ojcm/2491>(in Eng.).

Turysbek P.C. (2023) Qoja Axmet Yasawı xıkmetterindegi adamdıq murat pen imandılıq negizderi [Fundamentals of humanism and morality (on the Hikmetas of Khoja Ahmed Yassawi)]. *Bulletin of L.N. Gumilyov Eurasian National University. Philology Series*, 142(1). — P. 134–145. <https://doi.org/10.32523/2616-678X-2023-142-1-134-145> (in Kaz.).

Urazaliyeva U., Bekalaeva A.O., Kassymova G. (2024) Obuchenıye cherez virtual'nuyu real'nost': rezul'taty pilotnogo issledovaniya angliyskogo yazyka [Virtual reality-supported education: results of a pilot study on English language]. *Bulletin of the Eurasian Humanities Institute*. Issue 3. — P. 235-247. <https://doi.org/10.55808/1999-4214.2024-3.22> (In Russ.).

Uteeva K.Zh., Zharmagambetova A.S., Kassymova, G. (2023) Teaching significance of preserving national identity in intercultural communication in the global world. *Scientific Journal «Bulletin of NAS RK»*, 403(3). — P. 257-266. <https://doi.org/10.32014/2023.2518-1467.507> (in Eng.).

Vesisenaho M., Juntunen M., Häkkinen P., Pöysä-Tarhonen J., Fagerlund J., Miakush I., & Parviainen T. (2019) Virtual Reality in Education: Focus on the Role of Emotions and Physiological Reactivity. *Journal of Virtual Worlds Research* (Vol. 12, Issue 1). <https://doi.org/10.4101/jvwr.v12i1.7329> (in Eng.).

Publication Ethics and Publication Malpractice in the journals of the «Central Asian Academic Research Center» LLP (Almaty)

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct (http://publicationethics.org/files/u2/New_Code.pdf). To verify originality, your article may be checked by the originality detection service Cross Check <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www: nauka-nanrk.kz](http://www.nauka-nanrk.kz)

ISSN 2518–1467 (Online),

ISSN 1991–3494 (Print)

<http://www.bulletin-science.kz/index.php/en>

Директор отдела издания научных журналов НАН РК *А. Ботанқызы*

Редакторы: *Д.С. Аленов, Ж.Ш. Әден*

Верстка на компьютере *Г.Д. Жадыранова*

Подписано в печать 25.08.2025.

Формат 60x881/8. Бумага офсетная. Печать - ризограф.

37,0 п.л. Тираж 300. Заказ 4.