Оригинальная статья / Original paper

doi:10.17853/1994-5639-2024-6-42-68

Formation of potential foreign language teachers' research competence at the university as a condition for the modernisation of education

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Abstract. *Introduction.* The investigation of student research competence development, closely related to the issues of organising educational and scientific research activities in the university environment, is an urgent problem in higher education. *Aim.* The *aim* of the research is to theoretically substantiate and develop a model for the formation of research competence in potential foreign language teachers and to create conditions for its implementation in the university environment. *Methodology and research methods.* The study was founded on a methodological framework rooted in competent-based, active engagement, systematic, humanitarian, and axiological approaches. Analysis, synthesis, generalisation, comparison, experimentation, questionnaires, observations and statistical analysis were employed to establish the foundation of the research. *Results and scientific novelty.* The concept of "research competence" and its structural components are specified and identified as: motivational-personal, cognitive, behavioural, constructive-designing, transmissive, and reflective-evaluative. The authors have scientifically substantiated and tested a model for the development of research competence in future teachers of a foreign language. This model aims to develop the main research skills of students and includes motivational-personal, cognitive, behavioural, constructive-designing, transmissive, and reflective-evaluative components. *Practical significance*. The research findings can be used for organising educational and research work among various categories of participants, such as students, undergraduates, and foreign language teachers. Educational courses built upon this model can be seamlessly integrated into the curriculum as an independent module dedicated to the preparation of future foreign language teachers.

Keywords: research competence, research skills, teacher-researcher, pedagogical model, educational research activities, research work, modernisation of education

For citation: Mombekova M.M. Formation of potential foreign language teachers' research competence at the university as a condition for the modernisation of education. *Obrazovanie i nauka = The Education and Science Journal.* 2024;26(6):42–68. doi:10.17853/1994-5639-2024-6-42-68

Формирование исследовательской компетенции будущих учителей иностранного языка в вузе как условие модернизации образования

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Аннотация. *Введение.* Изучение процессов формирования исследовательской компетенции студентов, во многом связанное с вопросами организации учебно-исследовательской и научно-исследовательской деятельности в вузах, является актуальной проблемой высшего образования. *Цель исследования* – теоретическое обоснование и разработка модели формирования исследовательской компетенции будущих учителей иностранного языка и условий ее реализации в условиях вуза. *Методология и методы исследования.* Методологическую основу исследования составили компетентностный, деятельностный, системный, гуманитарный и аксиологический подходы. Для разработки основы исследования были использованы методы анализа, синтеза, обобщение, сравнение, эксперимент, анкетирование, наблюдение и статистический анализ. *Результаты и научная новизна.* Уточнено содержание понятия «исследовательская компетенция» и конкретизированы ее структурные компоненты: мотивационно-личностный, познавательный, поведенческий, деятельностный, трансмиссионный и рефлексивно-оценочный. Научно обоснована и апробирована авторская модель формирования исследовательской компетенции у будущих учителей иностранного языка, направленная на развитие основных исследовательских навыков студентов и включающая мотивационно-личностный, когнитивный, поведенческий (характерологический), конструктивно-проектировочный, трансмиссивный (передаточный) и рефлексивно-оценочный компоненты. *Практическая значимость.* Результаты исследования могут быть востребованы для организации учебно-исследовательской и научно-исследовательской работы среди различных категорий участников, таких как студенты, магистранты и учителя иностранного языка. Учебные курсы, построенные с учетом данной модели, могут быть легко интегрированы в учебный план как самостоятельный модуль, посвященный подготовке будущих учителей иностранных языков.

Ключевые слова: исследовательская компетенция, исследовательские умения, педагог-исследователь, педагогическая модель, учебно-исследовательская деятельность, научно-исследовательская работа, модернизация образования

Для цитирования: Момбекова М.М. Формирование исследовательской компетенции будущих учителей иностранного языка в вузе как условие для модернизации образования. *Образование и наука.* 2024;26(6):42–68. doi:10.17853/1994-5639-2024-6-42-68

La formación de la competencia investigativa de los futuros profesores de lenguas extranjeras en la universidad como condición para la modernización de la educación

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Abstracto. *Introducción.* El estudio de los procesos de desarrollo de la competencia investigativa de los estudiantes, que está relacionado en gran medida con las cuestiones de la organización de las actividades educativas y de investigación en las universidades, es un problema de gran actualidad en la educación superior. *Objetivo.* El propósito del estudio es fundamentar teóricamente y elaborar un modelo para desarrollar la competencia investigadora de los futuros profesores de lenguas extranjeras y las condiciones para su implementación en el ámbito universitario. *Metodología, métodos y procesos de investigación.* La base metodológica del estudio ha estado compuesta por enfoques de competencia, de actividad, por enfoques de carácter sistémico, humanitario y axiológico. Para desarrollar la base del estudio se utilizaron los siguientes métodos: análisis, síntesis, generalización, comparación, experimentación, cuestionamiento, observación, análisis estadístico. *Resultados y novedad científica.* Se aclara el contenido del concepto de "competencia investigativa" y se especifican sus componentes estructurales: motivacional-personal, cognitivo, conductual, basado en la actividad, de transmisión y reflexivo-evaluativo. El modelo del autor para el desarrollo de la competencia investigativa en los futuros profesores de lenguas extranjeras ha sido fundamentado y probado científicamente; tiene como objetivo desarrollar las habilidades investigativas básicas de los estudiantes e incluye compononentes de motivación personal, cognitivo, conductal (caracterológicos), de diseño constructivo, de transmisión (transferencia) y componentes reflexivo-evaluativos. *Significado práctico.* Los resultados del estudio pueden ser de requerimiento para organizar el trabajo educativo y de investigación entre varias categorías de participantes, como lo pueden ser, los estudiantes de pregrado, de maestría y profesores de lenguas extranjeras. Los cursos de formación creados teniendo en cuenta este modelo, se pueden integrar fácilmente en el plan de estudios como un módulo independiente dedicado a la formación de futuros profesores de lenguas extranjeras.

Palabras claves: competencia investigativa, habilidades investigativas, componentes de la competencia investigativa, docente-investigador, modelo pedagógico, actividades educativas y de investigación, trabajo de investigación, modernización de la educación

Para citas: Mombékova M.M. La formación de la competencia investigativa de los futuros profesores de lenguas extranjeras en la universidad como condición para la modernización de la educación. *Obrazovanie i nauka = Educación y Ciencia.* 2024;26(6):42–68. doi:10.17853/1994-5639-2024-6-42-68

Introduction

Developing research engagement among prospective foreign language teachers is a pressing concern in the 21st century due to the growing necessity for fostering research competence within the framework of educational modernisation and connection with socio-economic changes in market relations and the digital society, where a modern foreign language teacher should objectively and critically look at diverse problems, have a variety of research skills, and the ability to adapt to different situations and solve problems in the scope of education. In addition, the category "teacher-researcher" in Kazakhstan was introduced in accordance with

the Government Resolution of the Republic of Kazakhstan on January 23, 2012, No. 148, "On the introduction of the category "teacher-researcher" and the procedure for conferring the title "Honorary teacher of Kazakhstan"[1]. Corresponding to this decree, the category "teacher-researcher" was created to encourage teachers who are actively engaged in research activities and contribute significantly to the advancement of education.

In connection with the foregoing, higher educational institutions in Kazakhstan are tasked with preparing a future teacher-researcher for the implementation of scientific, educational, and science-related labor activities. It is emphasised that the importance of developing research competence among future foreign language teachers is related to globalisation and modernisation of education in the world. A foreign language plays the role of a bridge in the process of exchanging information and knowledge, and accordingly, future foreign language teachers have more opportunities to engage in scientific activities by publishing their works in materials near and far abroad in order to share their research discoveries. According to the State Educational Standard of Kazakhstan[1], a foreign language teacher must have professional competence, including research one, which implies the possession of a set of research knowledge, skills, and abilities for carrying out scientific and research activities.

Despite the many works on the competence-based approach in the sphere of educational modernisation, students of pedagogical universities are increasingly experiencing difficulties while writing scientific articles, reports, theses, coursework, design work, etc. These problems are related to the improper organisation of research activities at universities. As a result, during the writing of diplomas or term papers, students most often cannot determine a research topic and do not possess the motivation, research knowledge, and skills to be engaged in research activities. It is known that future foreign language teachers are not familiar with research activities since they have not worked with this form of organising a lesson. It can be emphasised that education at the university is often aimed at the formation of language competence and not research. In this regard, students meet the above problems, and after graduation from the university, they do not engage in scientific activities while working in educational institutions (school-college-university) and cease research work. For instance, only 5% of students enter the master's programmes[2]; this proves that the young generation does not possess any scientific interests to continue studies at the master's level.

Thus, it can be stated that the formation of research competence is a significant problem that requires a theoretical and practical solution.

[1] Stat'ja 11 "Zadachi sistemy obrazovanija" zakona Respubliki Kazahstan ot 27 ijulja 2007 goda № 319-III "ob Obrazovanii" = Law of the Republic of Kazakhstan "On Education" N. 319-III, Article 11 "Tasks of the Education System", 27 July 2007 [Internet]. 2017 [cited 2023 Sep 30]. Available from: https://online.zakon.kz/Document/?doc_id=30118747&sub_id=110000&pos=1275;-38#pos=1275;-38 (In Russ.)

[2] Zachem kazahstancy idut v magistraturu i est' li u nejo budushhee? = Why do Kazakhstanis go to graduate school and does it have a future? [Internet]. 2023 [cited 2023 Sep 30]. Available from: https://forbes.kz/process/education/est_li_buduschee_u_magistraturyi_v_kazahstane (In Russ.)

To solve the above problems, the following research **aim** was outlined: theoretical substantiation and development of a pedagogical model for the formation of research competence among potential foreign language teachers and creating conditions for its implementation.

The following **research questions** were posed:

1. How does a prospective foreign language teacher's "research competence" come to be defined? What structural components is it represented by?

2. What are the theoretical and methodical foundations: what are the theoretical and methodical foundations (approaches, methods, technologies and phases) involved in fostering research competence among students during their university education?

3. Is it possible for an elaborated pedagogical model to shape the research competence of prospective foreign language teachers?

The research **hypothesis:** if the developed model is introduced into the educational process at the university, the research competence of prospective foreign language teachers will be formed, since the model will contribute to the expansion of theoretical research knowledge and the development of research skills for conducting independent research and research-based lessons.

Limitations of the study: the validation of the pedagogical model aimed at fostering the research competence of future foreign language teachers was conducted on a limited sample consisting of students from one university (Academician E. A. Buketov Karaganda University); the sample consists of respondents from one region (Karaganda, Kazakhstan).

For the practical implementation of the developed pedagogical model, an elective course, a science club, a handbook, and methodological recommendations have been created that will facilitate the formation of the research competence of future foreign language teachers.

Literature Review

Currently, the development of research competence among teachers is a crucial issue in Europe, and concerted efforts are being made to strengthen it. The European Commission suggests that teachers' education must be related to research, which means that teachers have to analyse scientific facts and apply their knowledge in practice [1].

In the 1960s, the famous Finnish educator Matti Koskenniemi described the idea of a didactically thinking and reflective teacher who must possess research competence while fulfilling their professional work [2].

According to C. M. Clark and P. L. Peterson, research competence originates in the teacher's thinking style, which forms the scientific worldview [3].

The scientific worldview is based on justice and laws, proven methods of making decisions, and the practices of humanity as a whole [4].

For instance, researchers collect scientific facts, put forward hypotheses, test them, and formulate various theories, and all these actions can form the scientific worldview.

During the 1970s, there was a rise in the number of theoretical training courses and methodological instruction, where a research approach was applied to prepare school and university teachers. The concept of the teacher was focused on the establishment of research competence [5].

Corresponding to A. Mcmaugh, D. Saltmarsh and J. Sumsion, teacher education is a subject of constant debate for research, where the formation of teacher's research competence is an educational need of society [6]. The requirement for a modern teacher of the 21st century is handling of research competence in teaching.

According to American scientists S. Whiddett and S. Hollyforde, research competence is a requirement of competency-based teacher education. It includes the knowledge, skills, and values that a teacher-researcher must demonstrate to successfully complete a teacher education programme [7].

H. Niemi believed that the formation of research competence should begin at the university, which will prepare future graduates for organising and implementing research activities [8].

According to P. Kansanen and L. Krokfors, the formation of research competence embarks on scrutinising literature reviews, writing essays, reports, and research methods [9]. It provides students with opportunities to independently analyse theory and create their own ideas for further research in the theoretical or practical part of the thesis.

Corresponding to J. Glaesser, research competence also demands from teachers their own research based on bachelor's or master's theses, and they must continue working on research problems after graduation from the university. Any teacher has to make pedagogical decisions on the basis of research [10].

Coursework, diploma work, and master's theses are considered to be future foreign language teachers' formal research documents; however, the main priority of future graduates is to reveal something significant in research that must be beneficial for society.

Research competence of teachers is a new branch in pedagogy that arose in the 1990s in Kazakhstani literature and implies educational and research skills associated with the mental, search, logical, and creative processes of students' cognition [11].

According to the Russian researcher O. E. Lebedev, research competence is the totality of all principles for setting the specific goals of education and educational processes where it can help to summarise educational results [12].

A. L. Andreev reckoned that research competence is a skill to independently analyse, select, apply, and exploit the collected data in different situations of life [13].

According to A. V. Khutorovskaya, research competence involves the concurrent acquisition of both research knowledge and skills through cognition [14].

According to V. A. Dalinger, research competence is an orientation towards students' creative potential as well as their methods of thinking and acting, as well as the development of their cognitive forces [15].

V. F. Shatalov suggested that the research competence of a teacher encompasses the skills, knowledge, and abilities required to effectively engage in scholarly inquiry, critical thinking, and systematic investigation within the educational context [16]. This competence involves the capacity to design, conduct, and analyse research, as well as to apply research findings to enhance teaching methodologies and contribute to the broader field of education.

T. M. Talmanova considered the research competence of a teacher as a dynamic development of a personality that is ready for scientific and pedagogical, experimental, design, and practical activities in the professional sphere of life [17].

In Kazakhstan, Z. A. Isaeva, S. S. Kunanbayeva and Sh. T. Taubaeva raised the issue of the formation of teachers' research competence in their scientific work.

S. S. Kunanbayeva considered the formation of teachers' competence as a source of modernisation of education, where higher education must form crucial competences (such as research, communicative, professional, etc.) among future specialists [18].

Z. A. Isaeva established the idea of the progressive development of a professional research mindset among prospective educators within the higher education system. This concept emphasises the acquisition of scientific research methodologies and the augmentation of creative and critical thinking [19].

Sh. T. Taubaeva expanded on the notion of research culture, highlighting it as an innovative and didactic endeavour for educators within the holistic pedagogical framework of general education schools [20].

A. A. Bodalev defined the characteristics of a researcher as having the following competences: reviewing research literature, the ability to discover a research problem and find its extraordinary solutions, the conduct of the experiment, a strong desire to investigate a research problem, etc. [21].

There is another list of Kazakhstani scientists who explored the problems of the formation of research competence in the pedagogical condition, such as T. N. Bidaibekova, A. A. Moldazhanova, N. D. Khmel, V. K. Omarova and others.

Analysing the above definitions, it can be stated that the research competence of a future teacher is a mastery of research knowledge and skills that are necessary to conduct research activities in the field of education, but also the ability to transmit them to future generations in the process of learning.

Summarising the outcomes reported in the academic literature, I believe that research competence is the value of the pedagogical process, which reveals the teacher's research need to solve problems in education. Prospective foreign language teachers' research competence is characterised by theoretical and practical research knowledge and skills, where they receive the necessary advanced foreign experience and creatively apply their knowledge in professional activities. All these factors

indicate the importance of the formation of research competence during university studies.

Having analysed the content of the standard curriculum of Academician E. A. Buketov Karaganda University (Kazakhstan, Karaganda) in the speciality "Foreign Language: Two Foreign Languages", the insufficient potential of the disciplines to form research competence was identified. Thus, the relevance of the ongoing research was discovered, and the incomplete solution to the identified problem in pedagogical theories urged me to create a pedagogical model.

Methodology, Materials and Methods

The pedagogical experiment was organised at Academician E. A. Buketov Karaganda University at the Faculty of Foreign Languages under the educational programme 6B01705 – "Foreign Language: Two Foreign Languages" for 2nd year students in the period 2022–2023, where 98 students participated in the study on the formation of research competence, where 48 students formed the control group and 50 students were in the experimental group. Meanwhile, the students of the control group, consisting of 48 people, were trained according to the traditional system of education, and 50 students were trained according to the created model for the formation of research competence.

The developed pedagogical model includes target, content, procedural, assessment and result blocks that are focused on developing research competence specifically in pedagogical areas. Each of the allocated blocks will be aimed at achieving specific goals related to the formation and development of research knowledge and skills in future foreign teachers.

I. The target block defines a major objective of the educational model, "to form research competence of potential foreign language teachers". The peculiarities of the notion of research competence are explicated in this block, where I have discovered that research competence includes elements of key competences based on the competency-based approach (Table 1).

Table 1

The relationship of research competence with other types of competences

Competences	Definition	Research competence
Value-semantic competence	Awareness of the value of something	Awareness of the theoretical and practical value of the research
Information competence	Skills and abilities to work with information	Selection, classification and systematisation of scientific literature for writing research papers
Digital competence	Technical skills in the use of computer and digital technologies	Use of digital competence for writing reports, articles, theses, master's, dissertations, etc.
Acmeological competence	Skills and abilities aimed at achieving success	Development of leadership and organisational skills in conducting group research (project)

Sociocultural competence	Teacher's ability to work in several interdisciplinary areas	Use of not only Kazakhstani research experience but also foreign (study of foreign literature, academic mobility, internships, etc.)
Communicative competence	Communicative skills which are in compliance with the cultural norms of the language	Scientific public speech skills, which can help to defend a scientific point of view in front of a scientific society
Professional competence	A formed system of theoretical knowledge and skills applied to specific pedagogical situations	Research as part of the professional work of the future foreign language teacher

In addition, I have found that research competence is based on competence-based, active engagement, systematic, humanitarian, and axiological approaches (Table 2).

Table 2

Approaches to research competence

Approaches	Description
Competence -based	Constant enhancement of research knowledge and skills in a life-long learning process that can form research competence.
Active engagement	Development of the students' research skills through organising and guiding educational and scientific research work.
Systematic	Structuring the characteristics, properties, parts of the subject, and object of the research.
Humanitarian	Conducting research must be perceived as a student-centered process regarding the creative potential of students.
Axiological	A cognitive, practical, and valuable function in research, interconnecting theories and practice.

II. Content block. The structure of research competence in the content block of the pedagogical model consists of numerous components that were studied in the works of E. F. Zeera [22], D. C. McClelland, [23], Craig E. Runde [24], T. M. Talmanova [17], N. N. Stavrinova [25] and others.

Having analysed the works of scientists, who investigated the structural elements of research competence, the following components were spotted, which are significant for the formation of research competence:

1) *motivational-personal component*: an individual understands the value of the research, there is an internal motivation, which is stimulated by external motivation and based on personal experience [3];

2) *cognitive component*: an individual strives to learn the object of research through various research methods; thereby, he/she develops his/her research skills

and abilities [10]. At this stage, the researcher gathers theoretical material for conducting practical or experimental research;

3) *behavioural component*: a researcher covers the specific actions and strategies for conducting research, such as making a research plan, collecting, analysing, and organising data, using research methods, etc. [12].

4) *constructive-designing component:* the researcher strives to find practical solutions of the research problem, where his/her actions are aimed at creating a new product using the collected material and his/her own ideas and experience [19];

5) *transmissive component:* a teacher-researcher strives to explicate and convey research knowledge and skills for future generations and create conditions for organising research work in the educational process [2].

6) *reflective-evaluative component*: evaluation and presentation of research results [21].

III. The procedural block of the suggested model, which is focused on the formation of potential foreign language teachers' research competence, consists of the following steps:

a. Diagnostics of the formation of research competence using various diagnostic methods of research: D. Everson's questionnaire of metacognitive involvement [26], A. Mehrabian's questionnaire of motivation for achievement [27], M. Grant's method for determining the level of reflection [28], etc.

b. Theoretical and methodological training is aimed at obtaining methodological knowledge and theoretical research skills through passing the elective course "Fundamentals of Scientific Research", consisting of 45 lectures, 30 practical classes, and 15 hours of independent work by students. The elective course "Fundamentals of Scientific Research" was based on problem-based learning technology where students should solve problematic research tasks and situations.

After completing the elective course using the created educational and methodological syllabus, research handbook, and methodological recommendations, students must:

1) know scientific terminology, varieties of science and stages of its development;

2) apply scientific methods in research;

3) know the types of research and choose the direction of pedagogical research;

4) choose a research problem, set the aim, objectives, subject and object of the research;

5) scrutinise and process the required data;

6) be able to identify the types and stages of the pedagogical experiment;

7) create criteria and diagnostic tools in the pedagogical experiment;

8) process the theoretical and empirical research findings;

9) draw up research work corresponding to university requirements;

10) prepare a scientific public speech, etc.

c. Practical and methodological training for cultivating research competence should promote practical research skills via the establishment of a science club

within the Faculty of Foreign Languages at Academician E. A. Buketov Karaganda University.

The science club was conducted in the English language, which boosted not only research competence, but also communicative one.

The tasks of the "Young Researcher" club of students are:

– theoretical and practical preparation for research;

– increasing potential foreign language teachers' intellectual, scientific and pedagogical level;

– training students to analyse important problems in the field of pedagogy, psychology, methodology, etc. and conduct scientific research;

– preparing students for active participation in scientific conferences and other similar events held in the republic, near and far abroad, at the university and department level;

– development of independent ideas and individual proposals for solving research problems;

– implementation of events with the participation of foreign universities and development of academic mobility, etc.

d. At the reflective-consolidating stage, students obtain feedback on conducted research at scientific events such as round tables, conferences, seminars, etc. Students are able to not only acquire feedback from professional specialists but also estimate their own outcomes from research and others.

IV. In the assessment block, diagnostics of the initial and control levels are carried out according to the components of research competence (Table 3).

Table 3

The system of assessment of the formation of research competence

Components	**Characteristics of research levels**		
	Low	**Average**	**High**
1	4	5	6
Motivational-personal	A student does not see the value of research. There is no internal or external motivation, scientific and cognitive need. He/She does not know how to conduct research and use personal experience.	There is internal and external motivation, research interest, and skills with scientific information. However, sometimes external motivation is required to maintain an internal one.	A student sees the value of research; there are clear research skills, abilities, and knowledge. He/She is able to work independently without external motivation. He/She applies creativity and originality to solve a problematic task.
Cognitive	Characterised by an inability to think critically. There is no research logic, theoretical and methodological knowledge about conducting research.	There is incomplete independence in critical thinking and research actions. Theoretical and methodological knowledge is grouped and actively used in the research process.	Research actions are free and independent; theoretical and methodological knowledge and skills are fully assimilated. There is a purposeful interest in obtaining and mastering new knowledge without external factors.

Behavioural	Unconscious research actions are performed by analogy. There is no effectiveness in committed research actions.	Research activities were carried out under the guidance of a supervisor. drawing up goals, objectives, hypotheses, choosing methods, etc.	Conducting independent investigation of the research problem and finding creative solutions: making a plan, selecting approaches and research methods, etc.
Constructive-designing	A student is not able to apply methods and conduct experimental work. He/She does not understand the essence of the experiment and cannot organise the practical part of the research.	A student knows the types and stages of the pedagogical experiment and can test results of the research. However, assistance and consultation with the scientific adviser are observed.	Characterised by the independence of conducting experimental work. He/She is able to statistically process the results of the experience and draw a conclusion from the research on an independent basis.
Transmissive	There is a low level of theoretical knowledge; a student is unable to transfer it to another person and apply it in practice.	A student can successfully apply theoretical knowledge but finds it difficult to use his knowledge and skills for others.	The student has research knowledge and skills and can transfer them to others and motivate other participants or mentees to conduct research.
Reflective-evaluative	Inability to evaluate the results of own research and the research of others. A student does not understand the initial aim of the research.	Evaluative skills are developed at an intermediate level. A student knows the role of the study and is able to critically reason about the results with some doubts.	Mental operations and critical analysis are well developed. A student actively discusses results of the research and estimates the results of others.

V. In the result block, the potential foreign language teachers' research competence will be obtained, where research competence is the integration of research knowledge, skills, qualities, experience, etc. to carry out research in professional activities.

Research Results

During the preliminary stage of the experiment, the initial level of research competence was determined through five components: motivational-personal, cognitive, behavioural, constructive-designing and reflective-evaluative in the control group (48 students) and experimental group (50 students) using diagnostic methods. Based on the findings of the preliminary experiment, the following situation was observed: the motivational-personal, cognitive, behavioural, constructive-designing, transmissive and reflective-evaluative components of research competence are low by 78% in the experimental group and 77% in the control group. Only 22% of students in both groups have little motivation for conducting research and demonstrate basic research knowledge and skills.

In order to increase the levels of the components of research competence, the following pedagogical conditions were organised at the university:

1) educational research (elective course "Fundamentals of Scientific Research");

2) science club "Young Researcher" that consists of the following sections:

– scientific and cultural activities (intellectual games, visits to research centers and laboratories, interviews with university professors, seminars, etc.);

– informational work with students (announcing various seminars, webinars, competitions, conferences, as well as providing information assistance of writing articles);

– scientific research (solving problematic tasks, participation in conferences, round tables, conducting a lesson with elements of research, etc.);

The realisation of pedagogical conditions was based on problem learning, gaming, student-centered, developing, modular, health-saving, research, creative technologies.

Depending on the chosen technology, a teacher or scientific adviser can choose the following forms of teaching and working with students (Fig. 1):

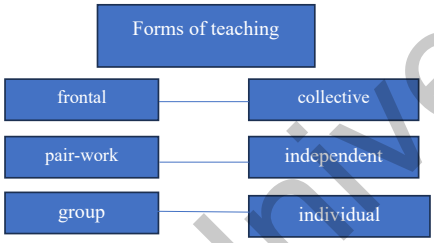

Fig. 1. Forms of teaching for formation of research competence

So as to form the motivational-personal component of students, intellectual games, debates, interviewing professors, visiting research libraries, scientific centres, and laboratories, consulting, and mentoring works were organised within the framework of the scientific and cultural section of the science club. All work conducted by students was based on a humanitarian approach and student-centred technology, where the individual interests of students were considered.

I also conducted an interview about how the science club "Young Researcher" influenced the motivation to engage in scientific activities. Here are some answers from members of the Science Club:

1. "I really liked the conversations with university professors. Also, I was inspired by the scientific experience and achievements of our dear professors. Now I also want to connect my life with science" – Zhaniya S., 2nd year student.

2. "It was a great experience for me to visit research institutes and research centers as part of my research topic. I met experienced researchers in various fields of scientific activity. I am very grateful to the science club for such an invaluable experience" – Asylbek T.

3. "It was very informative for me to participate in the debate on the topic "The benefits and drawbacks of online learning" at the science club. I was finally able to share about the main difficulties of online learning" – Salima K., 2nd year student.

4. "The most interesting thing for me was the role-play game in the science club, where we played the role of the school administration, got acquainted with the

school regulations, organised the educational, up-brining and research processes, and made lesson plans with elements of Research Action, etc. I had an incredible experience and realised the responsibility for the future of the younger generation" – Camila C., 2nd year student.

After conducting a formative experiment, the level of formation of the motivational-personal component of research competence was checked using A. Mehrabian's questionnaire (Motivation to achieve success in research) [27]. The ranking of points was the following: 83% of students sought achievement in research activities; 14% of students avoided difficulties in performing research work; however, with the help of a scientific adviser and the science club, they were able to overcome difficulties during conducting the research; and only 3% of students did not possess any motivation for research (Fig. 2).

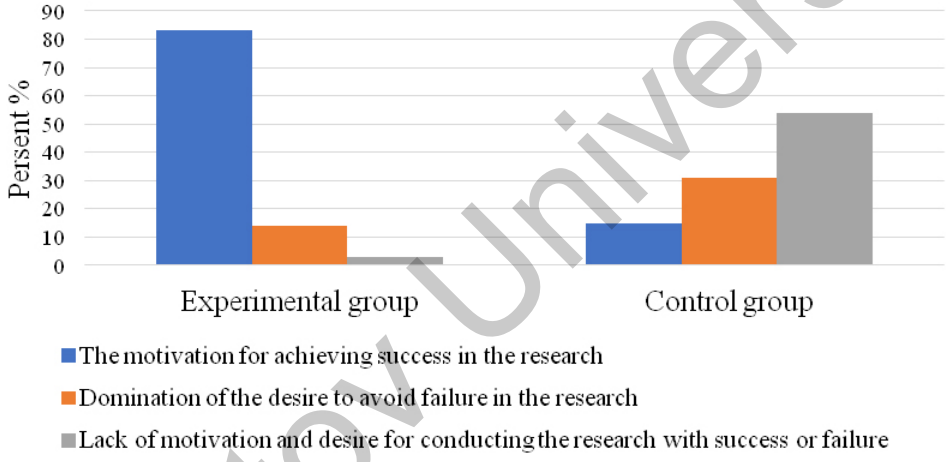

Fig. 2. Final output of assessing the motivational-personal component of research competence

To form a cognitive component of research competence, educational research in the frameworks of the elective course "Fundamentals of Scientific Research" was conducted, where students obtained theoretical research knowledge. Conducting the elective course was based on modular concentrated technology and systemic approach, which suggested investigating step by step the structure of research.

To determine the increase in the cognitive component of research competence, a test for knowledge of the basics of scientific research was proposed, where the experimental group students achieved high results: 45% of the students received from 90 to 100 points, 33% of the students obtained from 89 to 75 points, and 21% of students scored between 60 and 70 points. It means that 78% of respondents successfully passed the test. However, the level of the control group remained unchanged: most students received satisfactory and unsatisfactory marks. Here it is worth highlighting that the control group could not win in the intellectual game

"Evrika", where the theoretical and practical research knowledge was checked. Eventually, the experimental group became the owner of diplomas 1, 2, 3 degrees and obtained award-winning gifts from the faculty.

The behavioural component of research competence in the final experiment was assessed through the D. Everson questionnaire (the formation of metacognitive involvement, use of strategies, action planning and self-assessment of conducted research work) [26].

Students solved the following problematic tasks:

1) how can we boost student motivation in research work;

2) how can the use of information and communication technology in research be optimized;

3) how can we develop critical thinking in students and promote the formation of analytical skills;

4) how can we ensure effective interaction between teachers and students;

5) how do you develop students' creativity and encourage them to innovate;

6) how do you effectively apply different approaches to organise research work.

The organisation of these tasks was based on problematic and active engagement approaches, where students committed a bunch of research actions such as identifying a research topic, aiming objectives, setting hypotheses, developing a plan, and using various approaches, methods, strategies, and principles of scientific research. It also included conducting a survey among the respondents in order to obtain the information and opinions needed to analyse the problem. The given tasks were focused on using problem learning technology, which means solving problematic tasks in the field of education.

According to the D. Everson's questionnaire conducted during the study, the following results were obtained:

Metacognitive involvement: more than 75% of students showed a high level of metacognitive involvement, which indicates the ability to process the information around us, read the parameters of the situation or task, and analyse them. It is evidence that the use of problem-based learning technology promotes the development of metacognitive skills.

Use of strategies: about 78% of students demonstrated the ability to use strategies in their research activities. It demonstrates that the use of a variety of research methods, different technologies, and approaches can help develop students' ability to choose and apply effective research strategies.

Action planning: approximately 74% of students showed a good ability to plan their research steps. It testifies to the importance of teaching students the skills of planning, structuring tasks, and managing time in the research process.

Self-assessment: over 77% of students demonstrated the ability to self-assess the outcomes of problem tasks and estimate the results of others.

The constructive-designing component of research competence is aimed at developing experimental research skills, where application of the obtained students' knowledge was tested in practice. To conduct practical research, students must be

aware of the significance of research and take into account the axiological approach, which interconnects the usage of theory and practice. To form the constructive-designing component of research competence, students defended their scientific projects (individually or in a group) at a round table on various topics. The most relevant topics were:

1) the influence of multimedia technologies on the effectiveness of learning and understanding of the educational material of students of different age groups;

2) the efficiency of various methods for measuring students' knowledge and skills regarding new assessment approaches in the educational environment;

4) the impact of intercultural learning on student intercultural competence development;

5) the effectiveness of differentiated learning methods for students with different language levels;

6) the role of feedback in the learning process for boosting students' academic motivation;

7) the development of cognitive skills and language abilities in preschool children, etc.

To find a practical solution, creative and research technologies were exploited to produce extraordinary research outcomes. To obtain these outcomes students defined a research aim, drew out a hypothesis, set tasks, used various scientific methods, got acquainted with the scientific literature, made a literature review, worked with various databases such as Web of Science, Scopus, Willey library, ResearchGate and other relevant sources.

After conducting the research, students developed models, projects, sets of exercises, training programmes, methodology, guidelines for students and teachers, and online platforms for teaching in accordance with the aim of each research topic. They focused on creating practical solutions that can be employed in the educational environment or learning process. The findings of the experimental study were reported in the round table materials[1].

The assessment was carried out according to the following criteria: the degree of disclosure of the problem, aim setting, planning, evaluation of results, and practical significance of the results on a 100-point scale.

About 74% of students successfully defended their projects and received high scores ranging from 80 to 92. It indicates that they demonstrated a high level of practical significance of the research work and students were able to apply their research knowledge and skills to solve educational problems.

It is significant to emphasise that the university appreciated and recognised the best work of students, rewarding them with gifts and diplomas of 1st, 2nd and 3rd degrees, which motivated students to continue their research development.

[1] Jazykovoe obrazovanie v jepohu cifrovoj transformacii obshhestva: Problemy i perspektivy = Language education in the era of digital transformation of society: Problems and prospects. 2022 Nov 15. Karaganda: Karaganda Buketov Univeristy; 2022. p. 159. (In Russ.)

However, students who did not take the elective course and were not members of the science club encountered difficulties in completing the project, and their results were satisfactory, with only 26% of students receiving scores between 60 and 79.

It emphasises the importance of including in the curriculum of educational programmes the elective course "Fundamentals of Scientific Research" and conducting a science club at the university to form research skills for the fulfillment of successful research work.

The transmissive component of research competence implies conveying research knowledge and skills. Future foreign language teachers were supposed to conduct a lesson with research elements for 10th grade's schoolchildren on the topic "A world without Disease"[1], which was based on a competent-based approach (transmitting obtained research knowledge for children), which implies developing children's research competence. The assessment of the research lesson corresponded to:

1) setting the aim, plan, and outcomes of the research lesson;
2) using approaches that increase the motivation of schoolchildren;
3) ability to express and convey research knowledge;
4) using research methods;
5) activities of schoolchildren:
– finding a problem of the topic, making a plan, setting a hypothesis, etc.;
– solving a problem, making own decisions and concussions;
– using academic vocabulary;

developing public scientific communication skills.

83% of future foreign language teachers were able to convey their research skills and knowledge: setting the aim of the lesson, using research methods, approaches, abilities to explicate new research materials, etc. Due to teachers' explanations, children were able to define a problem, set a goal, make a plan for the decision of the problematic tasks, and present the outcomes of the solution to the research problem in front of the public.

After completing the elective course and attending the science club, formation of students' reflective-evaluative research competence component was determined using M. Grant's questionnaire of self-reflection of research skills, where students should estimate (the full, partial, absence of) possession of research knowledge and skills [28]. 86% of experimental group students have research skills such as:

1) to solve a scientific problem;
2) to determine the aim, objectives, object and subject of research;
3) to put forward hypotheses and choose appropriate scientific and research methods;
4) to draw up a working plan for the study;
5) to work with literature on the research topic;
6) to analyse and process the received data and information;

[1] Dooley J. Aspect for Kazakhstan for grade 10. Science school. Almaty: Expressing Press; 2019. 173 p.

7) to lead the experiment and get ahead of its results;

8) to evaluate own research results and others;

9) to work in joint scientific research (project);

10) to express their scientific point of view, prove research relevance and practical significance, etc.;

11) to explicate and convey research knowledge.

The remaining 14% of respondents stated that they partially possess research skills because of the absence of theoretical and practical research knowledge (Fig. 3). However, none of the respondents chose the answer "I do not have research skills", which confirms the formation of research competence.

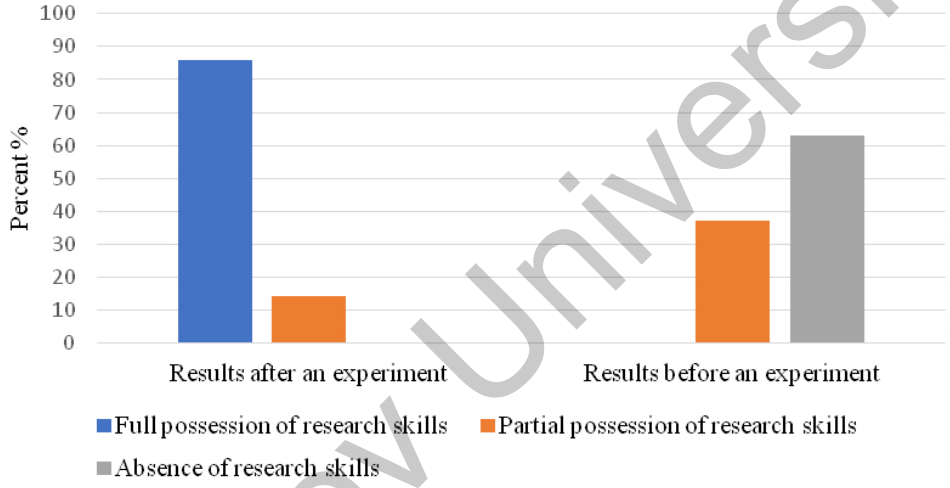

Fig. 3. A questionnaire of self-reflection of research skills before and after the experiment

According to students, the following factors contributed to form the research competence of future foreign language teachers:

1) the elective course "Fundamentals of Scientific Research": participation in this course allows students to master the basics of research, including methods of collecting and analysing data, developing research questions, hypothesis, plans, etc. Acquiring the necessary knowledge and skills in a scientific field can increase students' confidence in their abilities and motivation;

2) performing various problem tasks: solving problem tasks in research work is a challenge, but it can stimulate students to conduct research. Overcoming difficulties and achieving success in solving complex research problems can strengthen their self-esteem and satisfaction. It also aids in the advancement of analytical skills and critical thinking, which is an important aspect of scientific activity;

3) participation in the science club: joining a science club affords students the opportunity to interact with like-minded people, discuss their ideas, and receive

feedback from professors. It creates a supportive and inspiring environment where students can develop in the sphere of scientific research;

4) achievement of the set goals: students who have achieved research aim and objectives can feel satisfaction and pride in the outcomes of the conducted study. Successful completion of tasks, obtaining the expected results and achieving a real research result can enhance motivation and stimulate further research activities;

5) recognition and confirmation: if students receive recognition for their research efforts and achievements, this can positively affect their self-esteem. Validation from the scientific community, supervisors, peers, or publications can give students confidence in their research abilities and motivate them to continue their scientific work;

6) professional and personal growth: if students see that their research work contributes to their professional and personal development, this can strengthen their motivation to be engaged in the research. The expansion of knowledge and skills, the acquisition of new experiences, and the opportunity to apply their talents and interests to scientific activities can be factors contributing to high research results.

The entirety of research competence components (motivational-personal, cognitive, behavioural, constructive-designing, reflective-evaluative) culminated in a comprehensive representation of research competence. In table 4, the comparative data of the final outcomes between the control and experimental groups were presented.

Table 4

Data comparison on the formation of research competence in the experimental (EG) and control (CG) groups

GROUPS	Comparative data on the formation of components of research competence											
	Motivational-personal		Cognitive		Behavioural		Constructive-designing		Transmissive		Reflective-evaluative	
	Control results	Final results	Control results	Final results	Control results	Final results	Control results	Final results	Control results	Final results	Control results	Final results
CG	31%	32%	42%	42%	40%	39%	37%	36%	34%	33%	35%	34%
EG	30%	83%	43%	78%	41%	76%	37%	74%	35%	83%	33%	86%

Positive modifications were discovered in the data analysis of all components of research competence in the experimental group. However, in the control group, no significant differences in indicators of positive changes were detected.

Thus, taking into account the conducted research, it can be deduced that the application of the developed model made it possible to form research competence in all its components:

1) the motivational-personal component of research competence. Potential foreign language teachers have shown interest in research activities relating education problems, and there is internal motivation to participate in various scientific events such as conferences, webinars, round tables, seminars, workshops, projects, etc.;

2) the cognitive component of research competence. Students of the specialty "Foreign Language: Two Foreign Languages" have replenished their fundamental knowledge about science and research through the use of the elective course "Fundamentals of Scientific Research";

3) the behavioural component of research competence allowed future foreign language teachers to apply their research knowledge in practice: conducting theoretical and practical research, collecting and analysing data, using various scientific methods and approaches, formulating research hypotheses, developing research tasks, analysing the results, etc.;

4) the constructive-designing component of research competence encouraged students to conduct empirical research, choose the appropriate type of pedagogical experiment and diagnostic criteria and tools, apply statistical methods and process research results, create unique research products for the advancement of foreign language education, etc.;

5) the reflective-evaluative component of research competence has formed an adequate research self-assessment among students, where a student can assess own research findings and other research participants. They were able to critically evaluate their work and accept constructive criticism from professors.

Results and Discussion

Thus, the primary finding of the study on the basis of a doctoral dissertation was the scientific substantiation and testing of the author's model for the formation of research competence, which is vital for the professional training of future foreign language teachers. The formation of research competence at the university allows students to enhance research skills such as the ability to analyse and evaluate information, formulate hypotheses, conduct experiments, etc. Foreign language teachers, who possess research competence, often have plenty of opportunities to participate in research projects, overseas internships, and international conferences where they can present their research and share knowledge with other scientists. This helps them expand their network of professional contacts and increase their competitiveness in the labor market.

The acquisition of research competence also contributes to the advancement of students' self-confidence and independence. They learn to set research aims and objectives, develop plans, and evaluate the progress of research work that help them improve research and leadership qualities and confidence in their abilities. Moreover, the students of the Faculty of Foreign Languages not only increased their motivation for research, they replenished their theoretical and practical research

knowledge and skills, which will help them easily conduct their own research for a thesis and continue research activities in a professional environment.

In addition, the formation of research competence at the university facilitates the creation of a research culture in the educational institution. Teachers and students actively interact and exchange ideas and experiences, which can lead to the growth of the intellectual potential of the university. A scientific atmosphere stimulates innovation and promotes the development of new ideas and scientific discoveries.

The formation of research competence at the university is an important element in preparing students for future scientific and professional activities. This contributes to the enhancement of the quality of education, the development of science, and the progress of society.

B. G. Barnett and R. Muth indicate that the research work of university students is the public market leader of the educational activities of the university [29]. According to W. G. W. Hui, Chinese universities are currently concentrating on developing talent in the field of research through meritocratic evaluation of concepts, altering study schedules and admission criteria, and forming a continuing education system "bachelor-master-PhD" [30].

A future foreign language teacher's research competence is a part of mastering a profession, which can be considered as a necessary basis for the formation of professional competence. It is crucial to understand that the findings of the study should be considered because they will advance progress in science and education.

The formation of research competence indicates an increase in students' overall innovative potential. According to M. Aydeniz, K. Baksa and J. Skinner, innovative potential of the researcher is the ability to view familiar phenomena from a new perspective, discover potential opportunities and hidden relationships and propose and promote new ideas [31].

In addition, a positive trend in the experimental group was noticed in the research informational literacy of students, which is manifested in effective ways of interacting with information, including the search, systematisation, processing, transmission, and practical application of information in the research. The data obtained from the studies of A. Wilson [32], F. Böttcher and F. Thiel [33] confirm that a modern student, who is constantly in the information flow, feels difficulties in finding reliable and up-to-date information in English for research. It indicates the need to develop students' research informational literacy in the modern information environment.

Research competence is becoming a key element of education, as it aids in fostering independence, critical thinking and the ability to select information and solve problems within the scope of education. As the importance of research competence increases, universities should create conditions for formation of required research skills and educational programmes should include different forms of research work: projects, laboratory research, seminars, scientific practices, etc.

Conclusion

The developed pedagogical model demonstrates its ability to form future foreign language teachers' research competence. Creating conditions at the university for the formation of research competence allowed students to develop research skills and stimulate their interest in research work.

According to the foregoing, it can be concluded that a theoretical model that was developed formed the necessary research competence for a future teacher-researcher, who must be constantly engaged in research activities.

The developed model creates the conditions and requirements at the university for the formation of research competence. A number of organisational events (science clubs, seminars, courses, etc.) at the university, focused on the concept of "I am a teacher-researcher", helped to solve problematic tasks in the sphere of education, develop innovative methods and programmes, introduce innovations through research, replenish independently research knowledge, skills and experience through research activities.

Thus, I can conclude that the formation of research competence at the university is necessary for the implementation of professional activities.

The scientific significance of the study lies in the development of a model for the formation of research competence, which can lead to the strengthening of the quality of preparation for future foreign language teachers. The practical relevance is in the possibility of employing the developed model within the academic context at universities, increasing education quality, and raising the professional level of graduates.

Possible options for developing and solving the problem include broadening the application range of the model to other specialisations of education, as well as assessing long-term results and the efficiency of the formation of potential foreign language teachers' research competence. This will improve and refine methods and approaches, which will lead to even more effective development of students' research competence in the future.

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Conflict of interest statement. The author declares that there is no conflict of interest.

Received 20.10.2023; revised 16.04.2024; accepted 08.05.2024.
The author has read and approved the final manuscript.

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Информация о конфликте интересов. Автор заявляет об отсутствии конфликта интересов.

Статья поступила в редакцию 20.10.2023; поступила после рецензирования 16.04.2024; принята к публикации 08.05.2024.
Автор прочитал и одобрил окончательный вариант рукописи.

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Información sobre conflicto de intereses. El autor declara no tener conflictos de intereses.

El artículo fue recibido por los editores el 20/10/2023; recepción efectuada después de la revisión el 16/04/2024; aceptado para su publicación el 08/05/2024.
El autor leyó y aprobó la versión final del manuscrito.