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## VARIOUS ASPECTS OF THE NEED FOR PROFESSIONAL DEVELOPMENT OF TEACHERS IN KAZAKHSTAN

The article discusses various aspects of professional development of teachers in the Republic of Kazakhstan in the context of modernisation of the education sector. Particular attention is paid to factors influencing teachers' demand for professional development, including changes in educational standards, introduction of digital technologies, updating of teaching content and requirements for teachers' professional competencies. The aim of the study is to identify priority areas and factors that determine teachers' needs for professional development in the context of updated educational content, with professional development (PD) being seen as a key mechanism in Kazakhstan's school reform agenda. At the same time, there is a lack of research at the local level on specific areas in which teachers seek to strengthen their professional competencies. This study analyses the self-assessed professional development needs of teachers in general education schools and examines their variability depending on gender, age, teaching experience, qualification level and language of instruction, which is of scientific and practical importance. The research methodology used data from the international TALIS-2018 study, including responses from Kazakhstani teachers (N = 6566). Methods of contingency table analysis, comparison of mean values, factor analysis and rating analysis of identified factors were applied.

The results of the study highlight the need to take into account the balanced and practice-oriented needs of teachers when organizing their professional development, as well as the importance of considering socio-demographic differences – gender, age, experience, level of education and language characteristics – when planning professional development programs. This is because effectively meeting diverse needs and developing human capital requires a differentiated approach. The results can be used in the development and improvement of professional development programs for teaching staff.

**Keywords:** teachers, professional development, need for PD, teacher education, socio-demographic factors, TALIS.

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### Қазақстандық мұғалімдердің кәсіби даму қажеттіліктерінің түрлі аспектілері

Мақалада Қазақстан Республикасында мұғалімдердің білім беру саласын жаңғырту жағдайында кәсіби дамуының түрлі аспектілері қарастырылады. Білім беру стандарттарының өзгеруін, цифрлық технологияларды енгізу, оқытудың және мұғалімнің кәсіби құзіреттілік талаптарын қосқандағы мұғалімдердің кәсіби білігін арттыру сұраныстарын құруға әсер ететін факторларға ерекше назар аударылады. Зерттеудің мақсаты білім берудің жаңартылған мазмұны жағдайында мұғалімдердің білігін көтеру сұраныстарын анықтайтын басымдықты бағыттар мен факторларды айқындау мен Қазақстанда жүргізіліп жатқан мектеп реформасының күн тәртібіндегі шешуші тетік болып табылатын мұғалімдердің кәсіби дамуы (PD) болып отыр. Дегенмен мұғалімдер күшейткісі келетін нақты салалар туралы жергілікті ауқымда жасалған зерттеулер аз. Бұл зерттеуде орта білім беретін мектептердегі мұғалімдердің өзін-өзі есептейтін PD қажеттіліктерін зерделейді және олардың жынысына, жасына, тәжірибесіне, біліктілік деңгейіне және оқыту тіліне байланысты қалай өзгеретінін зерттеу ғылыми-тәжірибелік маңызға ие. Зерттеу әдістемесі ретінде TALIS-2018 халықаралық сауалнамасының қазақстандық

пайдаланып, байланыс кестелеріне талдау жасалып, орташа мәндердің салыстыруы, факторлық талдау және анықталған факторлардың рейтингтік талдаулар қолданылды.

Зерттеу нәтижесі мұғалімдердің кәсіби дамуын ұйымдастыруға теңестірілген және тәжірибеге бағытталған қажеттіліктерін ескереді, оларға мұғалімдердің кәсіби дамуын жоспарлау кезінде жынысы, жасы, еңбек өтілі, білім деңгейі және тілдік ерекшеліктері сияқты әлеуметтік-демографиялық айырмашылықтарды ескеру қажет, өйткені бұл әртүрлі мұқтаждықтарды қанағаттандыру мен адами капиталды тиімді дамыту үшін сараланған тәсілді талап етеді. Зерттеу нәтижелері педагогикалық мамандардың кәсіби білігін көтерудегі бағдарламаларды әзірлеу мен жетілдіруде қолданылуы мүмкін.

**Түйін сөздер:** мұғалімдер, кәсіби даму, кәсіби дамуға қажеттіліктері, мұғалімдерді даярлау, әлеуметтік-демографиялық факторлар, TALIS.

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### Различные аспекты потребности учителей Казахстана в профессиональном развитии

В статье рассматриваются различные аспекты профессионального развития учителей Республики Казахстан в условиях модернизации сферы образования. Особое внимание уделяется факторам, влияющим на формирование запросов педагогов к повышению квалификации, включая изменения образовательных стандартов, внедрение цифровых технологий, обновление содержания обучения и требования к профессиональным компетенциям учителя. Цель исследования заключается в выявлении приоритетных направлений и факторов, определяющих потребности учителей в повышении квалификации в условиях обновленного содержания образования, при этом профессиональное развитие учителей (PD) рассматривается как ключевой механизм повестки проводимой в Казахстане школьной реформы. Вместе с тем на локальном уровне отмечается недостаток исследований, посвященных конкретным областям, в которых учителя стремятся усилить свои профессиональные компетенции. В данном исследовании анализируются самооценочные потребности в профессиональном развитии учителей общеобразовательных школ, а также изучается их вариативность в зависимости от пола, возраста, педагогического стажа, уровня квалификации и языка обучения, что имеет научно-практическую значимость. В качестве методологии исследования использованы данные международного исследования TALIS-2018, включающие ответы казахстанских учителей (N = 6566). Применялись методы анализа таблиц сопряженности, сравнение средних значений, факторный анализ и рейтинговый анализ выявленных факторов.

Результаты исследования подчеркивают необходимость учета сбалансированных и практико-ориентированных потребностей учителей при организации их профессионального развития. Таким образом, при планировании программ профессионального развития необходимо учитывать социо-демографические различия, такие как пол, возраст, стаж, уровень образования и язык преподавания, так как это требует дифференцированного подхода для удовлетворения разнообразных потребностей и эффективного развития человеческого капитала. Это обусловлено тем, что эффективное удовлетворение разнообразных потребностей и развитие человеческого капитала требуют дифференцированного подхода. Полученные результаты могут быть использованы при разработке и совершенствовании программ повышения квалификации педагогических кадров.

**Ключевые слова:** учителя, профессиональное развитие, потребность в профессиональном развитии, подготовка учителей, социально-демографические факторы, TALIS.

### Introduction

The development of mankind goes hand in hand with the development of knowledge. The first thing that comes to mind when it comes to education is schools, which are the center of knowledge. And

the heart of the school is – teachers. There is a lot of research that describes how teachers improve the academic and social achievement of children and adolescents (Jiang, 2022, Kiuru, 2022). The OECD's 2005 "Teachers Matter" Report on School Teachers states that teacher training, recruitment

and professional development are key to the social and economic development of any country (OECD Publishing, 2005).

After the collapse of the Soviet Union, each Central Asian country has developed its education system in different ways. During the years of independence, the education systems of these countries have undergone significant changes (Silova, 2020). In view of the new socio-cultural and economic realities, Kazakhstan carried out three major educational reforms in 2000, 2010 and 2018 years (Ibrayeva, 2021). Improving specialists in accordance with global requirements was a necessary step for the further development of Kazakhstan. For that in 2018 the “Nazarbayev Intellectual Schools” network was opened in all regions of the country. Primary, middle and high school is designed to develop, research, monitor, analyze, test and implement modern models of educational programs (Bridges, 2014).

All the changes in education have had a profound effect on teachers. Teachers need to be constantly evolving in order to keep up with these innovations. The government has developed a basic state position to increase the capacity of teachers, and has implemented several reforms in this area, such as «Teacher status» (Law of the Republic of Kazakhstan «On the Status of a Teacher», 2020) and «the increase of the amount of the stipend for pedagogical specialties» and in addition, every year the passing score for admission to pedagogical specialties rises, so over the past few years the minimum score for admission has changed from 50 to 75 points (Nurymbetov, 2022). It is not enough for school teachers to know their subject well and teach it to students. Nowadays, in addition to teaching the subject, teacher has to carry out educational and psychological work with students (Veen, 2001). It is necessary to share additional information and organize special events for students at classroom to gain a deeper understanding of the subject (OECD Publishing, 2019).

For the most part, applicable changes place an additional burden on teachers. The main aspect of the concept of teacher interest is that there is an interest not only in the content of the subject, but also in the field of didactics and education. In terms of subject interest, we understand the interest in subjects such as biology, mathematics, geography. This subject cover not only what is taught in the curriculum, but also aspects of a broad topic. Didactic interest is the teacher’s interest in teaching methods, didactic literature and how to better prepare teaching content. Educational interest is an interest in aspects of edu-

cation or issues in the teaching profession. This may include, for example, discussions about education or parenting goals, values, and social competencies, as well as how to deal with inclusive students or difficult situations in the classroom (Schiefele, 2013). Teachers will not be able to accomplish all of these tasks if they are not provided with an enabling environment for ongoing and continuing professional development.

Professional development of a teacher as an activity that “develops the skills, knowledge, experience and other characteristics of a person as a teacher” (OECD, 2009). Professional development of teachers contributes to the implementation of reforms in the field of education, the establishment of close ties between students, schools and local government agencies, the education of people with disabilities (Jovanova-Mitkovska, 2010). According to Darling-Hammond and others, the professional development of teachers does not end with graduation, on the contrary, professional development is a continuous process that begins with the teacher’s enrollment in school (Darling-Hammond, 2017). Professional development of teachers is a multifaceted process, which requires a preliminary study of the needs of teachers in professional development in the context of various factors. By studying teachers as a subject of research, they can be grouped under certain socio-demographic categories, which, as a result, will give more positive results of professional development programs (Thoonen, 2011., Vanblaere, 2016). In recognizing teachers as the basis for decision-making regarding professional development, the responsible structures should take the basis for the design, modification and development of professional development programs, Knowles and others said (Thoonen, 2011). Since the goal of all professional educational programs for teachers is to develop the educational process at school, thereby increasing the level of education in general. But not all activities taken give the expected results, which leads to the need for in-depth study of professional development programs (Postholm, 2018).

### Literature review

Novice teachers or teachers with few years of work experience can be characterized as a separate group that needs to carry out professional development. Young teachers need help in adapting to the specialty, which is expressed in an orientation program in teaching or mentoring with more experienced colleagues. Adaptation to the new envi-

ronment and professional communication among colleagues make the process of establishing new personnel in schools difficult (Biryukova, 2019). As suggested by Biryukova and others professional development programs for young teachers, it should be developed separately from the general program and should include assistance from senior colleagues or a mentoring program (Biryukova, 2019., Chernobay, 2020., Little, 2012).

The professional development of teachers cannot be assessed by the volume of organized activities or the number of participants or the results of students, this complex multifaceted concept must include different parameters, both organization and assessment (Odabaşı, 2011). Scholars believe that this procedure should take place over a long period of time, it is necessary to approach the solution of emotional, social and intellectual problems collectively, in parallel to explore the effectiveness of the event and teachers as a subject of research, contextualization of practice in the classroom and school environment (Little, 1993., Wilson, 1999). The professional development of teachers has been researched for many years and by many authors, but the most effective professional development program has not yet been achieved. For example, acceptance and satisfaction with the PD program, increased motivation and knowledge, practice learned in the classroom and student outcomes determine the effectiveness of the program (Lipowsky, 2010., Lipowsky, 2015). The effectiveness of professional training of teachers can be added by optimizing educational activities and differentiating participants based on the results of socio-demographic analysis of teachers. Battey and Kafai insist that professional development programs should include research in a social and political context (Battey, 2007). The primary survey results were obtained by TALIS experts, then we analyzed the professional development program according to some socio-demographic categories in order to get a clearer picture of the need for effective work. This paper aims to map the self-perceived professional development needs of Kazakhstani teachers (N = 6566) from the TALIS-2018 survey and identify the areas of greatest demand. It then examines how the magnitude and structure of those needs differ by teachers' gender, age, teaching experience, education level, and language of communication using predictive table tests, mean comparisons, and exploratory factor analysis.

#### *Brief review of PD in Kazakhstan*

The Law on «Teacher Status», adopted in Kazakhstan, provides for the participation of each

teacher in professional development courses at least in every five years (Law of the Republic of Kazakhstan «On the Status of a Teacher», 2020). According to OECD reports Chernobay and Tashibayeva say that 98% of teachers participated in professional development programs at least once in the last 12 months (Chernobay, 2020., OECD, 2019). The recent results also show that the PD among the school teachers are widespread. «Orleu» center for professional development has reported that in 2022 there are 74206 teachers had PD courses, a year later 86348 teachers had finished courses (JSC «National Center for Advanced Training «Orleu», 2022., 2023). The study of the student assessment system, the study of the general school curriculum, the improvement of knowledge in the main subject and the improvement of teaching methods are the areas that are most focused on the professional development of teachers in Kazakhstan (Chernobay, 2020). In addition, the most common professional development programs for teachers in Kazakhstan are: exchange of experience with colleagues or coaching, participation in additional seminars / courses, participation in professional associations, reading professional literature, participation in conferences and visiting other educational institutions (Chernobay, 2020). Most of teachers (86%) agree that above written development programs positively impact them, while average in OECD countries is 82% (OECD, 2019).

#### *Use of TALIS-2018 results*

This article presents some of the results of the Teaching and Learning International Survey (TALIS). In 2018, this study was conducted for the third time, it involved teachers and school principals, where, through a sociological survey, they expressed their opinion and position on various educational issues. The periodic conduct of this study contributes to a better understanding of the situation and the corresponding development of educational policies in different countries participating in this project. The TALIS project is carried out by the Organization for Economic Co-operation and Development (OECD) in collaboration with over 40 other countries participating in this survey. The survey questionnaires aim to collect information based on the responses of school principals and teachers on issues such as the vocational education they received and further professional education; their beliefs and teaching practices; review of teachers' work. The survey also includes feedback and recognition about educators' work, school leadership, management and work planning (OECD, 2019). The organizers note that the TALIS study aims to reflect the pic-

ture of various educational practices in all countries participating in this project, since both countries in general and individual specialists in particular may differ in their approaches to the educational process. Participation in this survey was completely voluntary, each potential survey participant could refuse to participate at any time, the data was processed in a generalized form, without identifying the school and personal data of the respondents. Thus, the study focuses on the experiences of educators in order to understand and describe as accurately as possible their work and attitudes. The project experts admit that since this is an international survey, it is possible that some of the questions do not fit very well into the national context of each country. Therefore, not only comparative international analysis is of interest, but also the analysis of data for each specific country separately. This article presents the results of the analysis of some issues in Kazakhstan.

#### *The importance of considering the main language of communication*

It is of interest to study whether there are differences in the needs of teachers for professional development in the context of various socio-demographic characteristics. Kazakhstan is the most multicultural country in the region of Central Asia, this aspect is due to various historical events, the dominant part of which occurred during the tsarist Russia and Soviet Union [30]. Let us outline just a few of them: penetration of Russian and foreign capital, settlement of favorable areas for agriculture, the evacuation of the population of the European part of the USSR during World War II, the creation of camps for repressed citizens and their families, the development of virgin lands in the post-war period and the construction of important industrial facilities of all-Union significance, for which citizens from all republics of the Soviet Union came together (Kozina, 2007). As a result, more than 130 ethnic groups live in modern Kazakhstan, despite significant external migration from the country after the collapse of the USSR. So, according to official statistics, 67% of Kazakhs, 21% of Russians and 12% of citizens of other nationalities are Kazakhstanis (Shabdenova, 2015). Thus, the state language is Kazakh, but along with it, Russian is widely used, which is spoken regardless of ethnicity. It should be noted here that the government is making attempts to develop trilingualism, so that citizens master three languages: Kazakh, Russian and English, but so far, the first two prevail. In post-Soviet countries, it is necessary to take into account the factor of Russian-speaking and local-speaking groups of teachers (Baiteliyeva, 2015). Thus, in

addition to gender, age groups and other characteristics, it is of interest to study research data in the context of the main language of communication of teachers (Kazakh and Russian).

#### **Materials and methods**

It seems important to understand how the professional development of teachers is going on and in what areas the professional development of teachers is required. For this, the TALIS project experts asked questions 19 to 28 in the survey questionnaire, covering various aspects of the indicated direction. The survey questionnaire is available at the link on the OECD website (OECD, 2018).

As mentioned above, in the realities of Kazakhstan, it is important to take into account the language of communication as one of the main factors. Certain results of the TALIS study were analyzed in the context of various socio-demographic characteristics available in databases, in particular: gender, age groups, main language of communication, educational level and work experience as a teacher. For this, the analysis of contingency tables, comparison of means, factor analysis and ranking of the obtained factors into percentile groups were applied.

At the same time, the analysis presented in this article has data limitations, which is expressed in a limited set of variables, in the context of which it is possible to analyze the data, for example, this is the absence in the available database of variables reflecting the type of settlement, material and economic status of teachers, type of schools.

#### **Sampling**

In Kazakhstan, 6566 teachers from all regions of the country took part in the survey. Socio-demographic characteristics of the respondents indicate that the survey covered various groups of teachers by gender (76.5% of women and 23.5% of men), age groups (8% under 25; 12% – 25-29 years old; 27% – 30-39 years old; 25% – 40-49 years old; 23% – 50-59 years old; 4% – 60 years old and older). At the same time, the sample represents teachers in the context of the main language of communication and teaching (54% Kazakh and 46% Russian), also in the context of work experience as a teacher (11% – up to 3 years, 23% – from 3 to 10 years, 31% – from 10 to 20 years and 34% – 20 years and more). The average years of experience as a teacher is 14.4 years (Mean), the standard deviation is 11.0 (Std. dev.), The minimum period of teaching is several months, the maximum is 60 years. The most common (Mode) work experience as a teacher is 10

years, the median value is also 10 years. The survey covered teachers with different levels of education according to the classification of levels of education based on the International Standard Classification of Education (ISCED): 5% – it is levels 3, 4 and 5; 87% – level 6 and 8% – levels 7 and 8.

### Results and discussion

When applying for a job, newly arrived employees undergo orientation training or induction training, which is also part of professional development. Such events are either organized as formal structured programs or informally organized as separate events. In general, they are intended to support the introduction of new teachers into the teaching profession or to support already experienced teachers who are just starting out in a new school. For this, the respondents were asked question 20: “When you began work at this school, were the following provisions part of your induction?”. The question arises as to how such activities are implemented in Kazakhstani schools, the results of the answers indicate that the dominant part of teachers attended face-to-face introductory courses or seminars (91%). Also 91% indicated that they had planned meetings with the director or experienced teachers. In most cases (88%), new teachers are supervised by school prin-

cipals or more experienced teachers. At the same time, most often (92%) cooperation is established with other new teachers or (79%) team training with experienced teachers [10]. At the time of the survey, 62% and 48% of online courses and online activities passed, respectively, the pandemic and subsequent quarantines of 2020 changed this state of affairs, now all 100% of teachers visit and conduct their activities online. Only about 29% of teachers noted a decrease in the teaching load as part of introductory activities to the profession.

To determine the need for professional development, teachers were asked the question: “For each of the areas listed below, please indicate the extent to which you currently need professional development” in the survey questionnaire, this is question #27 in the survey questionnaire. The survey participants were asked to mark the level of need for each of the fourteen areas of professional development, that is, where training is more or less required. The results of the answers are presented in Table 1, the data are ranked in descending order of answers according to the highest level of need. The data show that for the majority of Kazakhstani teachers (66%-67%) the highest level of need is observed in the areas of “Information communication technology skills for teaching” and “Student assessment practices”.

**Table 1** – The need for professional development (self-assessment of teachers), N = 6566

	No need at present	Low level of need	Moderate level of need	High level of need
ICT skills for teaching	16%	18%	40%	26%
Student assessment practices	16%	17%	42%	25%
Knowledge of the curriculum	24%	17%	37%	22%
Pedagogical competencies in teaching my subject field(s)	18%	19%	44%	19%
Student behaviors and classroom management	23%	21%	37%	19%
Teaching cross-curricular skills	15%	19%	47%	19%
Knowledge and understanding of my subject field(s)	21%	17%	43%	18%
Teacher-parent co-operation	20%	20%	42%	18%
Analysis and use of student assessments	16%	20%	48%	16%
Approaches to individualized learning	18%	20%	47%	15%
Teaching in a multicultural or multilingual setting	25%	24%	37%	14%
Teaching students with special needs	29%	20%	38%	13%
Communicating with people from diff cultures or countries	23%	26%	39%	12%
School management and administration	31%	25%	34%	10%

The analysis of the contingency tables showed that there are statistically significant differences ( $p < 0.05$ ) in the need for training in the direction of “Information communication technology skills for teaching” in the context of gender, age groups, level of education and the main language of communication. In this area, the need is higher among female representatives than among male representatives, and the need is higher among teachers over the age of 30 than among teachers under the age of 30, also the need is higher among teachers with the level of secondary and higher education who do not have a master’s degree or higher (level 3-6). Significant differences are observed in the context of the main language of communication: 84% of teachers who filled out the questionnaire in the Kazakh language noted the need (37% high and 47% medium) for professional development in the above-mentioned direction, among teachers who filled out the questionnaire in Russian, there are 46 % (13% high and 33% medium). In the context of the teaching experience, there are no significant differences.

In post-Soviet countries, it is necessary to take into account the factor of Russian-speaking and local-speaking groups of teachers as mentioned by (Baiteliyeva, 2015), there was considered separately as different groups of teachers, since the difference in needs in this area varies almost twice depending on the language of instruction. In TALIS reports and other studies, this important factor is sometimes not noted and a generalized approach is taken to study this issue.

Analysis of the “Student assessment practices” direction in terms of gender, age groups, level of education and working experience and the language of communication also showed statistically significant differences ( $p < 0.05$ ). The need for professional development is more often observed among male teachers than among female teachers, among younger teachers (under 40), among teachers with a secondary specialized education (level 3-5), and

also among teachers whose main language of communication is Kazakh. It is noteworthy that the need for “Student assessment practices” is higher among teachers with 20 years of experience and more than among less experienced teachers. It can be assumed that the reforms in education have led to certain changes in the curriculum, as a result, some experienced teachers with long work experience do not quite understand how to assess students, respectively, they are more in need of professional development in the assessment of students.

Based on the areas indicated in Table 1, an additive index of professional development is built. On average, teachers noted 8 areas in which they have a need for an average or high level of professional development, noted in Table 1. Overall, 7% of teachers did not mark any areas in which they need professional development and 15% noted about needs in all areas of professional development, noted in table 1.

Analysis of the average index of professional development showed that there are differences ( $p < 0.05$ ) in the context of gender, age groups, work experience, level of education and the main language of communication (Table 2). Men indicated more areas than women in which there is a need for training. Also, the older the age group, the fewer directions for training were noted. But at the same time, the longer work experience as a teacher, the more directions for professional development were noted. Teachers without a higher education level (Level 3,4,5) indicated more areas for professional development than teachers with a higher education level. Teachers, whose main language is Kazakh, noted, on average, significantly more areas in which there is a need for professional development (Table 2). The need for professional development of teachers in a detailed context for some socio-demographic indicators forces them to do periodic analyzes and research in order to achieve effective development programs.

**Table 2** – Compare Means of Index of professional development

		Mean*	Std. Deviation	Minimum	Maximum	N
Total		8,2	4,7	0	14	6566
Gender	Female	8,1	4,7	0	14	5023
	Male	8,6	4,5	0	14	1543

*Continuation of the table*

		Mean*	Std. Deviation	Minimum	Maximum	N
Age groups	Under 25	9,1	4,4	0	14	500
	25-29	8,7	4,4	0	14	815
	30-39	9,0	4,4	0	14	1764
	40-49	8,2	4,6	0	14	1650
	50-59	7,3	4,8	0	14	1542
	60 and above	5,2	4,8	0	14	292
Experience	Less than 3 years	7,2	4,8	0	14	749
	3 to 10 years	7,6	4,7	0	14	1516
	11 to 19 years	8,2	4,6	0	14	2020
	More than 20 years	8,9	4,5	0	14	2242
Education level	Level 3,4,5	9,0	4,6	0	14	352
	Level 6	8,1	4,7	0	14	5687
	Level 7	8,0	4,6	0	14	521
Language	Kazakh (Kazakhstan)	10,5	3,5	0	14	3540
	Russian (Kazakhstan)	5,4	4,4	0	14	3026

\*Significance level < 0,001

In order to reduce the dimension of the variables in question 27, and thereby understand what factors are behind the proposed categories of professional development presented in Table 1, a factor analysis was made. To do this, the variables were previously recoded into dichotomous variables, where 1 – meant the selected answer options “Moderate level of need” or “High level of need”, that is, this area requires professional development for teachers.

As a result of factor analysis, two factors were formed, the data are presented in the table below. The **first factor** combined variables that demonstrate the need for professional, educational areas of development, such as pedagogical competencies,

student assessment, and the like. The **second factor** combined variables reflecting the need for special skills for learning and communication with specific social groups, representing students with special needs and learners, from different cultures and countries (Table 3).

For each of the formed factors and for each participant in the survey, a special factor value was calculated. These variables can be used to establish relationships for factor values. The most common method for this is dividing the factor values into four groups of percentiles, demonstrating the degree of manifestation of each of the factors in the context of the analyzed characteristics.

**Table 3** – Results of factor analysis

Rotated Component Matrix <sup>a</sup>		
	Component	
	1	2
Knowledge of the curriculum	,820	
Pedagogical competencies in teaching my subject field(s)	,806	
Knowledge and understanding of my subject field(s)	,791	
Student assessment practices	,776	
Student behaviours and classroom management	,746	
Analysis and use of student assessments	,740	

Continuation of the table

Rotated Component Matrix <sup>a</sup>		
	Component	
	1	2
Teacher-parent co-operation	,704	
ICT skills for teaching	,690	
Approaches to individualised learning	,653	
Teaching cross-curricular skills	,558	
Teaching in a multicultural or multilingual setting		,798
Teaching students with special needs		,697
Communicating with people from different cultures or countries		,694
School management and administration		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

In order to understand among which specific social groups the need for the indicated directions of development is widespread, as noted above, the division of factor values into four groups of percentiles was applied, demonstrating the degree of manifestation of each of the factors in the context of socio-demographic characteristics.

The need for the development of pedagogical competencies (the first factor) is more widespread

among representatives of the male gender, among teachers under the age of 40, among teachers with work experience of 10 years or more. Also, the need for the development of pedagogical competencies (the first factor) is more common among teachers with a secondary specialized education (Level 3,4,5) and among teachers who filled out the questionnaire in the Kazakh language (Table 4). Differences are significant at the  $p < 0.001$  level.

**Table 4** – The need for the development of teachers’ pedagogical competencies (the first factor) in the context of socio-demographic characteristics

		No need at present	Low level of need	Moderate level of need	High level of need
Total		25%	25%	25%	26%
Gender	Female	26%	25%	23%	26%
	Male	21%	25%	30%	24%
Age groups	Under 25	18%	26%	33%	23%
	25-29	21%	29%	29%	22%
	30-39	19%	25%	29%	28%
	40-49	25%	26%	23%	27%
	50-59	32%	22%	19%	27%
	60 and above	50%	22%	13%	15%
Experience	Less than 3 years	31%	29%	19%	22%
	3 to 10 years	29%	26%	21%	24%
	11 to 19 years	25%	25%	24%	26%
	More than 20 years	21%	23%	29%	27%

Continuation of the table

		No need at present	Low level of need	Moderate level of need	High level of need
Education level	Level 3,4,5	20%	20%	32%	28%
	Level 6	25%	25%	24%	26%
	Level 7,8	25%	34%	22%	19%
Language ID	Kazakh (Kazakhstan)	7%	19%	35%	39%
	Russian (Kazakhstan)	46%	32%	12%	10%

\*Significance level < 0,001

Analysis of the need for the development of special competencies of teachers (the second factor) showed that the need for them is more widespread among male teachers, among teachers under the age of 50, among teachers with 10 years of experience

or more, among teachers with a master's degree and above (Level 7, 8) and among teachers whose main language of communication is Kazakh (Table 5). The indicated differences are statistically significant at the  $p < 0.001$  level.

**Table 5** – The need for the development of special competencies of teachers (second factor) in the context of socio-demographic characteristics

		No need at present	Low level of need	Moderate level of need	High level of need
Total		25%	25%	25%	25%
Gender	Female	25%	25%	26%	24%
	Male	25%	23%	23%	29%
Age groups	Under 25	21%	21%	24%	34%
	25-29	20%	24%	26%	30%
	30-39	20%	25%	27%	29%
	40-49	24%	25%	28%	24%
	50-59	32%	28%	22%	18%
	60 and above	47%	24%	14%	15%
Experience	Less than 3 years	33%	23%	22%	22%
	3 to 10 years	26%	28%	24%	21%
	11 to 19 years	24%	25%	26%	25%
	More than 20 years	22%	24%	26%	29%
Education level	Level 3,4,5	26%	20%	24%	30%
	Level 6	26%	25%	25%	24%
	Level 7,8	20%	24%	27%	29%
Language ID	Kazakh (Kazakhstan)	19%	24%	26%	31%
	Russian (Kazakhstan)	32%	26%	24%	18%

\*Significance level < 0,001

In order to understand what barriers, according to teachers, prevent for their professional development, the question #28 was asked: “How strongly do you agree or disagree that the following present barriers to your participation in professional development?” The results of the responses are presented in Table 6, in descending order of the “Strongly disagree” responses. According to the data obtained, the most common barrier to professional development of teachers is lack of time, since teachers are loaded with busy work schedules and family responsibilities, as evidenced by the statements “I do not have time because of family responsibilities”

and “Professional development conflicts with my work schedule”.

It was assumed that there are differences in the gender by the most common problems, but the analysis of contingency tables did not reveal such differences ( $p > 0.05$ ), thus the most common barriers indicated above are typical for both men and women. Despite the statistical significance ( $p < 0.05$ ), analysis in the context of other features did not show significant trends, i.e. lack of time is a major barrier for many teachers, regardless of gender, age group, length of service, education or language of instruction.

**Table 6** – Opinions of teachers about barriers to professional development

	Strongly disagree	Disagree	Agree	Strongly agree
I do not have the pre-requisites	44%	40%	12%	4%
There are no incentives for participation in prof. developm.	27%	56%	13%	4%
There is no relevant professional development offered	19%	61%	16%	4%
There is a lack of employer support	17%	50%	27%	6%
Professional development is too expensive	16%	48%	30%	6%
I do not have time because of family responsibilities	14%	46%	32%	8%
Professional development conflicts with my work schedule	13%	48%	30%	9%

For many types of analysis, attention is drawn to the fact that more experienced teachers with more than 10 years of experience as a teacher are more interested in professional development, which can be explained by the achievement of conscious competence, that is, most of them are aware of insufficient knowledge in some areas, accordingly identified the need for professional development. There is also a spread of a low need for professional development among teachers aged 60 years and more, which can be explained by pre or retirement age, professional burnout and, accordingly, a low need for professional development among a certain part of teachers of this age category. But at the same time, this situation is not typical for all teachers aged 60 years and more, another part of them indicated the need for various areas of professional development.

## Conclusion

The TALIS project experts note the importance of taking into account the socio-demographic characteristics of teachers and school principals, since these characteristics, as well as the dynamics of the

workforce, are decisive factors to consider when examining the best policy for attracting and selecting candidates for teacher education and leadership training.

As done analysis has shown, it is necessary to take into account socio-demographic characteristics when developing programs for professional development for teachers, since there are differences in the context of gender, age groups, work experience, level of education and the main language of communication. The analysis also showed differences within each social group, which confirms the need for a differentiated approach in planning and implementing events for the professional development of teachers. This approach will allow taking into account the needs of various social groups and at the same time optimizing resources for organizing courses for professional development of teachers.

It should be noted that professional development of teachers is an integral component of the development of human capital in general. This is also noted by the experts of the TALIS project in their report: “the urgent task of the educational systems of countries today is to ensure that students acquire

the skills and competencies they need to succeed in modern society”. Professional development covers all stages of teacher training, from elementary education to on-the-job learning opportunities.

Therefore, continuous professional development is practiced, understood as an activity in the form of professional training on the job, going beyond primary education and introductory programs.

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