



Identifying Methods to Solve Teacher Shortages and Providing Professional Development of Teachers Needed for Education and Training

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Abstract

The current research aimed to investigate and identify the methods of solving the shortage of teachers and the provision and professional development of teachers. The research method used was descriptive and qualitative content analysis. The statistical population included deputy heads of departments, principals and deputy heads of schools, and researchers in this field. Fourteen people were selected as a statistical sample by snowball sampling. A semi-structured interview method was used. Based on the research findings, five key codes, nine core codes, and 54 codes were identified. In the category of policies and interventions, respectively, revision of courses, removal of non-harmful subjects and titles by 13%; in the category of human resources, reduction of the number of support and administrative forces by 15%; in the category of community interaction and cooperation, upgrading the position of the teacher in society with 37.5% and in the category of recruitment strategies, hiring elite and efficient managers at all management levels with 23% and in the category of incentives and financial support for salary reform Teachers and coordinated payment system had the highest frequency with 20%. As a result, to solve the teacher shortage problem, attention should be paid to multidimensional solutions.

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Introduction

In all societies, the education system is considered one of the most essential practical factors in development and progress, while the education system itself depends on different factors, including human resources. Human resources include teachers, administrators, administrative staff, and planners who work to achieve educational goals. Among the human factors, teachers have a more sensitive role due to being at the forefront and interacting with students. Therefore, the quality of their work and quantity plays a decisive role in education dynamics.

In this regard, ensuring a stable and qualified educational workforce is crucial for the long-term success of educational systems worldwide (Al-Thani et al., 2021; Miguel et al., 2021). Because everyone believes that teachers in the 21st century play an essential role in shaping the perspective of education and preparing students for the challenges and opportunities of the modern world (Carvalho et al., 2020; Ordu, 2021), they contribute by integrating technology into the learning process, designing learning experiences, encouraging students to creatively inquire, analyze and creatively solve problems, and prepare students for the complexities of the modern workforce (Abulibdeh et al., 2024; Adebisi et al., 2023). Also, teachers significantly contribute to students' social and emotional learning and nurture individuals who can navigate the social aspects of life (Mahoney et al., 2021).

Teachers play a vital role in fostering global awareness and a sense of global citizenship (Bosio, 2023; Estellés & Fischman, 2020). They help students understand different perspectives and international issues and ensure equitable access to quality education (Chan, 2023). They are at the forefront of implementing and adapting educational trends, such as project-based learning, flipped classrooms, and personalized learning, and ensure that education remains relevant and engaging (Low et al., 2021). Beyond academic education, teachers also act as mentors and guides and provide valuable actions for students as they progress (Haryani et al., 2021; Liesa-Orús et al., 2020). Therefore, they are essential in nurturing a generation of adaptable and innovative people. The importance of teachers in the 21st century lies in their ability to adapt to changes, foster a holistic approach to education, and

empower students with the skills and values needed to thrive in a dynamic and connected world. However, the teacher shortage is a common problem that different countries face in various periods.

Teacher shortages in the 21st century are a critical issue affecting education systems globally, affecting the quality of education, student outcomes, and overall school performance. Factors contributing to this shortage include increasing demand for qualified teachers (Mason-Williams et al., 2019), high attrition rate (See et al., 2020 a), teacher retirement (Wiggin et al., 2021), low salaries teachers (Biasi, 2021), talent attraction challenges, changing work environments, subject-specific shortages, geographic differences, diversity gaps and impact on student learning. (Edwards et al., 2022; Goldhaber et al., 2020; Potts, 2022) Several strategies have been proposed to deal with the challenge of teacher shortage, the most important of which have been briefly discussed in this article.

Competitive Salary and Benefits

Addressing the teacher shortage in the 21st century requires a multifaceted approach, including competitive salaries and benefits (Kwon et al., 2020). These elements can help attract and retain qualified people in the teaching profession. To make the profession more financially attractive, salary increases are applied, which generally reflect the level of education, expertise, and job demands. Performance-based pay systems can reward teachers for performance, such as student outcomes or contributions to the school community. Comprehensive benefits packages, such as health insurance and retirement plans, can also contribute to the overall attractiveness of a teaching career (Allegretto & Mishel, 2020). Also, assistance in the area of housing or living subsidies can be provided in areas with high living costs (Yun et al., 2020), especially in urban areas where housing costs may be an essential factor in career choice. Teachers can be given stipends or rewards for additional responsibilities, such as mentoring new instructors, leading extracurricular activities, or participating in curriculum development. Incentives for hard-to-fill positions can include higher salaries, bonuses, or additional benefits to attract

qualified professionals to areas of critical need (See et al., 2020; Lentini et al., 2024).

Financial Incentives and Scholarships

Financial incentives and scholarships can be effective solutions for attracting and retaining teachers and solving the deficiencies of the educational system. These strategies aim to reduce financial barriers, encourage people to pursue educational careers and support ongoing professional development. Scholarship programs for aspiring teachers can provide financial assistance to cover tuition, books, and other educational expenses, making the teaching career path more accessible. Grant programs encourage teachers to serve in high-need or underserved areas by receiving a portion of student financial opportunities for each year of service. Tuition reimbursement programs for current teachers seeking degrees or certifications encourage and retain experienced educators. Also, housing assistance or subsidies can be provided in areas with high living costs (Yun et al., 2020), especially in urban areas where housing costs may be an important factor in job choice (See et al, 2020 a).

Professional development grants can also be provided for teachers to pursue professional development opportunities and attend conferences or specialized training. Performance-based rewards linked to student outcomes and teacher evaluations can also motivate teachers and contribute to a culture of continuous improvement. By implementing a combination of financial incentives and scholarship programs, educational institutions can create a more supportive and attractive environment for teachers, ultimately reducing shortages and promoting the importance of the teaching profession (Smith & Wyness, 2024).

Targeted Recruitment Strategies

These strategies include identifying critical areas of need, aligning recruitment practices with those needs, and implementing plans to attract qualified individuals to the teaching profession. A thorough analysis of the

subject regions, geographic areas, or specific schools experiencing severe teacher shortages is conducted to identify critical shortage areas. For example, launching focused recruitment campaigns to attract people with expertise in high-demand subjects, such as science, technology, engineering, mathematics, special education for exceptional children, and foreign languages, are included in this category (McPherson & Lampert, 2024; Tomas, 2007). In this direction, cooperation is announced with universities and institutions to identify and attract potential trainers. In pursuit of this goal, personal development programs are also implemented that encourage people in the local community to pursue educational careers.

Professional Development

Professional development opportunities are essential to address teacher shortages in the education system (McPherson et al., 2024). These opportunities contribute to the growth and satisfaction of existing educators and make the teaching profession more attractive, leading to increased retention and recruitment. Some solutions related to professional development include designing professional development programs, providing subject-specific curriculum, conducting technology integration workshops, facilitating collaborative learning communities, implementing leadership development programs, creating mentoring programs, conducting workshops on student engagement strategies, providing training in cultural competency and diversity awareness, fostering professional learning communities, providing flexible learning options, supporting teachers in obtaining additional certifications or endorsements, providing financial support for continuing education, encouraging interdisciplinary collaboration, providing training in data-driven decision making and acknowledging and honoring achievements (Gore, 2017; Kennedy, 2016; Carlson & Gadio, 2002). Investing in continuous professional development opportunities is a sustainable and effective strategy to address teacher shortages by fostering a culture of constant learning and professional growth in the education system.

Table 1. The solutions used by the leading countries in the field of meeting the shortage of teachers

Number	Country	Reference	Solutions
1	Finland	(Webb et al., 2004)	Finland has succeeded in attracting and retaining high-quality teachers by implementing programs to increase the attractiveness of the teaching profession and create favorable working conditions.
2	Singapore	(Ng et al., 2018)	Singapore has used several strategies to deal with teacher shortages, such as increasing salaries and benefits, developing a culture of social education, and growing teacher education.
3	Canada	(Swanson & Mason, 2018)	Canada has responded to the shortage of teachers by attracting teachers from other countries, upgrading teaching education programs, and increasing commitment to support teachers in their professional and personal development.
4	Netherlands	(den Brok et al., 2017)	The Netherlands has succeeded in increasing the number and quality of its teachers by improving financial conditions, developing teaching skills, and creating support programs for teachers.
5	Germany	(Seeliger & Håkansson Lindqvist, 2023)	Germany is trying to solve the shortage of teachers by creating programs to attract students to study in the fields of education and teaching.
6	America	(Sutcher et al., 2019)	In some American states and regions, measures such as increasing teachers' salaries, developing student recruitment programs, and increasing teaching benefits have been used.
7	Australia	(Martinez, 2004)	Australia is trying to provide an effective teacher workforce by offering programs to recruit teachers with specific specializations, increasing financial conditions, and establishing professional development programs.

Some countries have used mixed strategies to improve teachers' working conditions, recruit new staff, and retain many experienced teachers.

In the continuation of the research related to the issue of teacher shortage, we can mention the results of Abdulahi (2022), "Reviewing the situation and providing policy solutions for the optimal organization of human resources in education and training," she stated that pointed out that in his research, to solve the shortage of teachers, one should pay attention to long-term solutions, including the development of multi-disciplinary and multi-skill training and the establishment of an integrated human resources management system. Revision and amendment of the Law on Service Obligers and the Law on the Selection of Teachers, the establishment of systems and mechanisms for attracting and hiring human resources

for the environment, targeted and justice-oriented outsourcing of educational, training, and administrative services, needs assessment, organization, and allocation of human resources, suitable for diverse educational environments, jobs, disciplines and actual needs of education and training, organizing human resources with a stabilization approach and reducing the ratio of administrative forces to educational staff, developing a plan to manage the working hours of teachers and trainers, establishing large educational and training complexes by combining small units, preparing necessary incentive packages to promote The retention rate of teachers in teacher shortage areas.

Lindsey (2021), in "The Teacher Shortage in the United States," stated in his research results that in the United States, teachers due to the lack of competitive

salaries, fear of personal security, and lack of support from The beneficiaries of education have decided to change their profession. Because teachers are not treated fairly, and if the right changes are made, the retention rate of teachers can be improved.

The results of the research of Tropova, Mirberg, and Johnson (2020) "Teacher Job Satisfaction: The Importance of School Working Conditions and Teacher Characteristics" showed that the teacher's workload, cooperation, and perception of students' discipline in school were the factors most related to teacher's job satisfaction. Regarding teacher characteristics, female teachers, who are more exposed to professional growth and more efficient teachers, tend to have higher levels of job satisfaction. It was also found that the relationship between teacher cooperation and job satisfaction is more evident for male teachers, while student discipline is more important for job satisfaction of teachers with lower self-efficacy beliefs. Policy implications are further discussed.

Razanen, Pitarinen, Falto, Sweeney, and Petri (2020), "Why leave the teaching profession? A longitudinal approach to the prevalence and persistence of teacher turnover intentions" also showed in their research results that 50% of Finnish teachers intended to quit. Turnover targets were remarkably stable, but their reasons varied. The lack of professional commitment and factors related to the school system and workload were the main reasons for the teachers' intention to leave. The results indicate several factors that should be improved simultaneously in the teaching profession to increase teachers' job satisfaction and retain them.

Edward and Chiuk (2018), "Why Not Robot Teachers: Artificial Intelligence for Addressing Teacher Shortage. Applied Artificial Intelligence" also raised in their research results that global teacher shortage is a serious concern that has severe consequences for the future of education. This requires new ways to approach the role of the teacher. The economic benefits of tireless work require teachers unbounded by natural human desires, highlighting the attention to robotics and artificial intelligence capabilities in education already available in other areas of human life.

According to Podolsky, Joseph Bishop, and Darling Hammond (2016), in "Solving the Teacher Shortage: How to Attract and Retain Excellent Educators," the most effective policies for attracting and retaining strong teachers include increasing their salaries, professional support, teacher preparation, working conditions, and district and school management.

Also, Mohammadi's (2007) "Evaluation of manpower planning in Iran's education and its problems" stated in his research results that accurate forecasting of human resources as a result of the instability of conditions, attention to political developments, and sensitivity to different social situations along with the technical aspects of this model and also creating motivation to maintain and attract human resources in the regions The need is necessary. In the long run, interactive models will be helpful if the necessary conditions are met for participating in related groups.

Today, the teacher shortage problem seriously affects Iran's education system. According to the report of the Majlis Research Center, in the past years, the retirement of a large number of teachers, and on the other hand, the lack of balance and proper distribution in the recruitments, as well as the implementation of the 6-3-3 educational system, caused a situation that some officials of this ministry compared to a tsunami. This situation led to the ratio of students to teachers, which is 2.19 according to the standards defined; for example, in the elementary school, in some areas, such as Tehran cities, reaches 43.57 (Abdolahi, 2022).

Factors such as High attrition rates due to job burnout, dissatisfaction with working conditions, low salaries and limited opportunities for professional growth, the retirement of working teachers, low teacher salaries, integration of technology in education, diverse learning needs, and focus on 21st-century skills present new challenges for teachers Creates potential. Also, geographical inequalities in rural and deprived areas compared to urban centers have caused this problem.

As a result, the challenge of lack of teacher force forced education and training to adopt methods apart from the conventional methods (teacher training

centers and recruitment tests subject to Article (2) of Farhangian University's statutes) such as teachers purchasing services and conscript teachers, some of these teachers due to lack of The professional qualifications of teachers were not able to guarantee the desired quality of the educational system. In addition to this, education and training to deal with the lack of human resources have taken solutions over the years; most of these solutions have been aimed at increasing the incoming forces, but these solutions have not reached their desired point due to recruitment restrictions as well as infrastructural problems and challenges of teacher training centers. Furthermore, in some cases, due to the lack of consideration of territorial development as well as some legislations such as "Determining the employment duties of teachers with the right to teach and training assistants of the literacy movement in the Ministry of Education and Culture" and the approval of annual additions to it, it causes an imbalance in the human resources of education and culture. Furthermore, there was a simultaneous shortage of forces as a surplus of forces in some areas.

In the manual for the organization of human resources for education and training in 2023-2024, the approaches and implementation policies for the lack of teachers are proposed, which include; Providing the needs from official human resources, contracts and existing specific work contracts, in a mandatory and non-mandatory form when necessary, optimal organization and full use of the mandatory hours of all working forces, as well as the maximum use of forces with a fraction of the mandatory hours and, accordingly, reducing the amount of non-mandatory notifications, organization of human resources and space in technical and professional courses/association and first secondary/second theoretical secondary, in a single and integrated manner with justice in the distribution of resources, use of intra-provincial and extra-provincial transfers mechanism in accordance with rules and regulations), effort to maintain Eligible forces for retirement, maximum use of the capacity and capability of retirees in meeting the needs of education and training, prohibition of the mission by receiving salaries from the origin and prohibition of the mission by maintaining the organizational post in particular and limitation in granting the mission to other institutions or changing the status and

appointment of teachers in Other jobs) especially administrative staff, managing the number of open goods in the public sector, in urban and rural areas, based on the strategic policies of "paying special attention to less developed areas" and "organizing the situation of under-populated classes," merging under-populated classes in one school. ; and also the gathering of low-population single-level classes and the formation of multi-level classes, the balanced distribution of secondary school students of the government and non-government sectors, in different branches and disciplines, with the approach of developing technical and professional education and associate (urban and rural), following the development program of exceptional education, Based on the instructions issued by the relevant ministry, training and education of teachers in the form of approved in-service courses based on multiple skills, for the educational coverage of exceptional students in multi-grade classes and integrated-inclusive students, development of preschool education, organization of human resources, with a stabilization approach and reducing the ratio of administrative forces to educational staff, designing mechanisms to increase the productivity of human resources, emphasizing the organization of classes and schools with low population and high population with the approach of developing and strengthening boarding schools and the central village plan, using the capacity of jihadi groups and elites.

But, the critical and noteworthy point here is that Alborz province still faces a severe shortage of teachers due to the high student population and geographical extent, despite the measures the Ministry of Education took in the past years. It seems that the existing methods to solve the problem of teacher shortage in this province are not efficient, and it is necessary to examine the opinions of experts in the field of education, deputy heads of departments, principals and deputy heads of schools, researchers in the field of education and learning environments in Alborz province. New and more efficient methods should be identified and presented according to the

current situation in Alborz province. Therefore, this research has been carried out to answer the question: What methods can be used to solve the teacher shortage problem in Alborz province?

Research Method

The current research is qualitative in terms of practical purpose and data collection method, and in terms of implementation method, it is descriptive and content analysis type. The statistical population examined in this research are all experts and experts in the field of education, including the deputy heads of education departments of Alborz province, principals and deputy heads of schools, researchers in the field of education and learning environments, of which 14 people were selected by sample method Snowball sampling was chosen as a statistical sample. A semi-structured interview method was used to collect the opinions of experts. To ensure the validity of the research, methods of review by participants (members), data alignment, and review by colleagues were used, and for data analysis, content analysis methods (open coding, central coding, and selective coding) were used.) used. In the process of qualitative data analysis, in the first step, essential points (open codes) were made, without bias, from the content of the interviews based on the researcher's impressions. Then, the open codes were examined, and central and selective codes were extracted.

Qualitative analysis was chosen because of its tools for examining detailed and detailed experiences

and opinions of individuals to understand teacher concepts and teachers' professional development. It is possible to gain access to the different perspectives and complexities in the field of education and find meaningful patterns in the data. Qualitative analyses in this research are based on inductive concepts because new patterns and concepts have been addressed through data collection from respondents' opinions and experiences. In this research, instead of starting with previous assumptions, the researcher analyzed data and research based on actual and experimental observations of people.

Research Questions

1. What are the most effective recruitment strategies for attracting qualified teachers to address shortages in specific educational contexts?
2. How do community perceptions of the teaching profession impact the retention and professional development of teachers?
3. What role do financial incentives and support systems play in enhancing teacher satisfaction and professional development in the face of shortages?

Research Findings

The findings extracted from the semi-structured interviews are presented as tables in this part of the article.

Table 2. Open codes, central concepts, and critical concepts

Abundance	Source Code		(Open Codes)	Main Concepts (axial codes)	Key Categories (optional)
	Background Research	Interview			
4		i1, i2, i3, i4	Giving priority to the Ministry of Education In the government program	Beyond the system level	

4		i2, i3, i5, i8	Special attention to Farhangian University		Policies and interventions
1		i11	Changing the structure of Farhangian University		
1		i11	Reducing the politicization of Farhangian University		
2		I5, i14	Using the experiences of other countries		
3		i3, i5, i11	Coordination Between Budget, Recruitment, Farhangian, and AP Organizations		
3	Podolsky, A et al (2016)	i11, i12	Establishing a committee for future research and future planning		
3	Organizational Manual (2023)	i1, i10	Training Multi-Skilled Teachers	At the system level	
4	Organizational Manual (2023), Abdollahi (2022)	i9, i11	Organizing and Merging Small Schools		
4		i1, i13, i8, i10	Proper Implementation of Teacher Ranking		
5	Abdollahi (2022), Organizational Manual (2023)	i10, i11, i12	Preventing Teachers from Being Assigned to Other Departments and Non-Profit Schools		
6	Räsänen, et al. (2020)	i9, i10, i12, i13, i14	Revision of courses and removal of unnecessary course headings and titles		
3	Abdollahi (2022)	i12, i14	Two shift schools		
3	Organizational Guidelines (2023), Abdollahi (2022)	i12	Extensive use of the capacity of other organizations, soldiers of teachers, elites		
4		i2, i4, i5, i7	Significantly Increasing AP Budget	Financial support	Incentives and financial support
3		i1, i5, i7	Increasing Farhangian University Budget		
9	‘ Martinez, 2004, Satcher et al.,	i2, i4, i11, i12, i14	Reforming Teacher Salaries and Unified Payment System		

	2019.den Brok et al. 2017,Ng et al., 2018)				
4		i7, i11, i12, i14	Increasing Hourly Teaching Wages (Retirees, Overtime)		
2	Räsänen, et al. (2020)	i7	Providing Targeted Incentives for Teachers in Deprived Areas		
2		i11, i13	Timely Payment of Teacher Claims		
1		i10	Exponential Increase in Teacher Salaries in Final Years to Reduce Retirement		
5	den Brok et al., 2017 Lindsay, B (2021) Podolsky,A et al (2016)	i1, i2	Improving Teachers' Living Standards to Motivate Attraction		
4	den Brok et al., 2017 Lindsay, B (2021) Podolsky,A et al (2016)	i1	Creating a comprehensive support network for teachers		
1		i2	Strong Health Insurance, Excellent Retirement Services	Competitive advantages	
4	Mohammadi (2008)	i4, i11, i12	Providing High-Level Welfare Services to Teachers		
2	Engel & Cannata ,2015	i10	Proximity of Residence to Workplace (Especially for Women)		
4	Abdollahi (2022)	i4, i8, i12	Providing Special Bank Facilities / Housing Subsidies to Teachers		
3	Abdollahi (2022)	i4, i10	Reducing stringent recruitment criteria in the selection process	Internal organization	Recruitment strategies
2		i3, i6	Coordination of AP and Farhangian University in		

			accurately predicting the number of students and fields of study		
5	Abdollahi (2022)	i2, i3, i5, i12	Reforming Recruitment System		
2	Organizational Manual (2023)	i1	Speeding Up Teacher Qualification Certification Processes		
6		i1, i2, i4, i5, i11, i14	Hiring Elite and Efficient Managers at All Management Levels		
3	Engel & Cannata 2015 Abdollahi (2022)	i10	Hiring Local Teachers	External organization	
3		i2, i11, i14	Increasing Farhangian University Capacity		
2		i7, i12	Changing Farhangian University Recruitment Policies		
2	Seeliger & Håkansson Lindqvist, 2023	i2	Launching campaigns to make society aware of the position of the teacher	Spiritual support	Community participation and cooperation
1	Edwards, I. B. Cheok, D.A 2018		Using Smart Robots		
6	Webb et al., 2004 , Sutchter et al., 2019	i1, i3, i5, i14	Improving the status of teachers in society (using all media and improving livelihoods)		
1		i11	Programs where experienced teachers are professional ambassadors and discover new talents		
2		i6, i12	Elevating Farhangian University's Status Among Other Universities		
4	Lindsay, B (2021) Toropova , A. Myrberg, E. Johansson, S (2020).	i1, i6	Independence and immunity of teacher parties and organizations		
2	Abdollahi (2022)	i11	Use of student teachers in the final year	Academic arrangements	human resources

1		i8	Use of 12-hour university students (both students in the same class))		
1		i8	Employing Students During Internship Days		
3	Abdollahi (2022)	i8, i14	Shortening Study Period (Associate Degree)		
2		i8, i14	Closing the program in three days and teaching in another three days		
4	Abdollahi (2022)	i6, i7, i9	Using Student Teachers' Capacity to Study at Other Universities		
1		i13	Attracting Final Year Students from Other Universities		
3	Abdollahi (2022)	i8, i13	Training and Employing Graduates of Other Universities		
2	Organizational Manual (2023)	i6	Employing Retired Teachers	Arrangements of the Education Organization	
5	Abdollahi (2022)	i7, i3, i14, i11	Reducing the Number of Support and Administrative Staff		
3	Organizational Manual (2023)	i4, i5	Teaching by Assistants, Managers, and Administrative Staff		
2	Abdollahi (2022)	i14	Increasing Mandatory Teaching Hours		
2	Organizational Manual (2023)	i14	Raising the Ceiling of Hourly Teaching		
2		i2, i12	Flexibility in Working Hours and Methods (Online or Distance Learning)		

Based on the findings presented in Table 2, after aggregating the codes and examining 54 open codes, nine central codes and five selective or critical codes were extracted. The obtained selective or key codes are policies and interventions (with two central codes and 13 open codes), recruitment strategies (with two

core codes and 13 open codes), incentives and financial support (with two core codes and eight open codes), community interaction and cooperation (with one core code and six open codes), human resources (with two core codes and 14 open codes). In the meantime, internships play an essential role in

providing teachers' professional development, and it is necessary to identify their effectiveness in addition to recognizing global approaches (Karimi and Rahmati,

2022, Rahmati and Karimi 2022: Rahmati and Karimi, 2022).

Table 3. Key categories of policies and interventions

Percent	Abundance	Source code		(Open Codes)	Main Concepts	Key Categories
		Background Research	Interview		(axial codes))optional(
8/7	4		i1, i2, i3, i4	Prioritizing the Educational organization in the government program	Beyond the system level	Policies and interventions
8/7	4		i2, i3, i5, i8	Special attention to Farhangian University		
2/2	1		i11	Changing the structure of Farhangian University		
2/2	1		i11	Reducing the politicization of Farhangian University		
4/3	2		i5, i14	Utilizing the experiences of other countries		
6/5	3		i3, i5, i11	Coordination Between Budget, Recruitment, Farhangian, and AP Organizations		
6/5	3	Podolsky,A et al (2016)	i11, i12	Formation of future research and future planning committee	At the system level	
6/5	3	Organizational Manual (2023)	i1, i10	Training multi-skilled teachers		
8/7	4	Organizational Manual (2023), Abdollahi (2022)	i9, i11	Organizing and merging small schools		
8/7	4		i1, i13, i10, i8	Proper implementation of teacher ranking		
11	5	Organizational Manual (2023), Abdollahi (2022)	i10, i11, i12	Preventing teachers from being assigned to other departments and non-profit schools		

13	6	Räsänen, et al. (2020)	i9, i10, i12, i13, i14	Revision of courses and removal of unnecessary course headings and titles		
6/5	3	Abdollahi (2022)	i12, i14	Two shift schools		
6/5	3	Organizational Manual (2023), Abdollahi (2022)	i12	Extensive use of the capacity of other organizations, soldiers of teachers, elites		
100	46	Total				

Based on the findings presented in Table 3, in the category of policies and interventions, two core codes beyond the system level and at the system level were identified, which include 13 open codes. Among the open codes, in order of priority of the codes, revision

of courses and removal of non-harmful headings and lesson titles with 13%, preventing teachers from being assigned to other offices and non-profit schools with 11% were ranked highest.

Table 4. Key components of incentives and financial support

Percent	Abundance	Source Code		(Open Codes)	Main Concepts (axial codes)	Key Categories (optional)
		Background Research	Interview			
8/9	4		i2, i4, i5, i7	Significantly Increasing AP Budget	Financial support	Incentives and financial support
6/6	3		i1, i5, i7	Increase in Farhangian University budget		
20	9	‘ Martinez, (2004) Sutcher et al., (2019).den Brok et al. 2017,Ng et al., 2018)	i2, i4, i11, i12, i14	Reforming teachers' salaries and coordinating the payment system		
8/9	4		i7, i11, i12, i14	Increasing Hourly Teaching Wages (Retirees, Overtime)		
4/4	2	Räsänen, et al. (2020)	i7	Providing targeted incentives for teachers in disadvantaged areas		
4/4	2		i11, i13	Timely Payment of Teacher Claims		
2/2	1		10	Exponential salary increase for teachers in		

				final years to reduce retirement			
11	5	Den Brok et al., (2017) Lindsay, B (2021) Podolsky,A et al (2016) .	i1, i2	Improving Teachers’ Living Standards to Motivate Attraction			
8/9	4	Den Brok et al., (2017) Lindsay, B (2021) Podolsky,A et al (2016)	i1	Creating a comprehensive support network for teachers	Competitive advantages		
2/2	1		i2	Strong Health Insurance, Excellent Retirement Services			
8/9	4	Mohammadi (2008)	i4, i11, i12	Providing High-Level Welfare Services to Teachers			
4/4	2	Engel & Cannata ‘ (2015)	i10	Proximity of Residence to Workplace (Especially for Women)			
8/9	4	Abdollahi (2022)	i4, i8, i12	Providing Special Bank Facilities / Housing Subsidies to Teachers			
100	45	Total					

Based on the findings presented in Table 4, two core codes of financial support and competitive benefits were identified in the incentives and financial support category, which had 13 open codes. Among the open codes, in the order of priority, the open codes

reform teachers' salaries and coordinate payment systems with 20% and improve the quality of teachers' livelihoods to create motivation to attract people, with 11% having the highest frequency.

Table 5. Key categories of recruitment strategies

Percent	Abundance	Source code		(Open Codes)	Main Concepts (axial codes)	Key Categories (optional)
		Background Research	Interview			

11/5	3	Abdollahi (2022)	i4, i10	Reducing stringent recruitment criteria in the selection process	Internal organization	Recruitment strategies
7/7	2		i3, i6	Coordination of AP and Farhangian University in accurately predicting the number of students and fields of study		
19	5	Abdollahi (2022)	i2, i3, i5, i12	Reforming the recruitment system		
7/7	2	Organizational Manual (2023)	i1	Speeding Up Teacher Qualification Certification Processes		
23	6		i1, i2, i4, i5, i11, i14	Hiring Elite and Efficient Managers at All Management Levels		
11/5	3	Engel & Cannata 2015, Abdollahi (2022)	i10	Hiring Local Teachers	External organization	
11/5	3		i2, i11, i14	Increasing Farhangian University Capacity		
7/7	2		i7, i12	Changing Farhangian University Recruitment Policies		
100	26	Total				

Based on the findings presented in Table 5, two core codes of intra-organizational and extra-organizational factors were identified in the recruitment strategies category, which had eight open codes. Among the open codes, in the order of priority, the open codes of recruiting elite and efficient managers at all management levels had 23%, and reforming the recruitment system with 19% had the highest frequency.

Table 6. Key categories of community interaction and cooperation

Percent	Abundance	Source code		(Open Codes)	Main Concepts (axial codes)	Key Categories (optional)
		Background Research	Interview			

12/5	2	Seeliger & Håkansson Lindqvist, 2023	i2	Launching campaigns to make society aware of the position of the teacher	Spiritual support	Community participation and cooperation
6/2	1	Edwards, I . B.Cheok, D.A 2018		Using Smart Robots		
37/5	6	Webb et al., 2004 , Sutchet et al., 2019	i1, i3, i5, i14	Improving the status of teachers in society (using all media and improving livelihoods)		
6/2	1		i11	Programs where experienced teachers are professional ambassadors and discover new talents		
12/5	2		i6, i12	Elevating Farhangian University's Status Among Other Universities		
25	4	Lindsay, B 2021 Toropova, A. Myrberg, E. Johansson, S 2020.	i1, i6	Independence and immunity of teachers' parties and organizations		
100	16	Total				

Based on the findings in Table 6, one core code named spiritual support was identified in the category of community interaction and cooperation, with six open codes. Among the open codes, in the order of priority, the open codes of improving the position of

the teacher in society (use of all media and improving livelihood) with 37.5% and independence and immunity of teacher parties and organizations with 25% had the highest frequency.

Table 7. Key categories of human resources

Percent	Abundance	Source code		(Open Codes)	Main Concepts (axial codes)	Key Categories (optional)
		Background Research	Interview			
6	2	Abdollahi (2022)	i11	Use of student teachers in the final year	Academic arrangements	human resources
3	1		i8	Use of 12-hour university students (both students in the same class)		

3	1		i8	Employing Students During Internship Days			
9	3	Abdollahi (2022)	i8, i14	Shortening Study Period (Associate Degree)			
6	2		i8, i14	Closing the program in three days and teaching in another three days			
12	4	Abdollahi (2022)	i6, i7, i9	Using Student Teachers' Capacity to Study at Other Universities			
3	1		i13	Attracting Final Year Students from Other Universities			
9	3	Abdollahi (2022)	i8, i13	Training and Employing Graduates of Other Universities			
6	2	Organizational Manual (2023)	i6	Employing Retired Teachers	Arrangements of the Education Organization		
15	5	Abdollahi (2022)	i7, i3, i14, i11	Reducing the Number of Support and Administrative Staff			
9	3	Organizational Manual (2023)	i4, i5	Teaching by Assistants, Managers, and Administrative Staff			
6	2	Abdollahi (2022)	i14	Increasing Mandatory Teaching Hours			
6	2	Organizational Manual (2023)	i14	Raising the Ceiling of Hourly Teaching			
6	2		i12, i2	Flexibility in Working Hours and Methods (Online or Distance Learning)			
100	33	Total					

Based on the findings in Table 7, two core codes were identified in the human resources category with the titles of university arrangements and AP arrangements, which had 14 open codes. Among the open codes, according to the order of priority, the open codes of reducing the number of support and administrative staff with 15% and using the student education capacity of

teachers in other universities with 12% had the highest frequency.

Discussion

Today, Iran's education faces a severe shortage of human resources, especially teachers. The measures taken based on the human resources organizing instructions and numerous measures did not respond to this deficiency, and the need to use new methods is essential. Therefore, examining the opinions of experts and people directly involved with the problem and examining effective methods by other countries can be helpful. Therefore, this research has been done in response to the question, what methods exist to overcome the teacher shortage problem?

In response to the research question and based on the research findings, five key codes were identified: policies and interventions, recruitment strategies, incentives and financial support, community interaction and cooperation, and human resources. This part of the research findings is in line with the findings of Lindsay's (2021) research, which considered financial support, fair treatment, and job security necessary for teacher retention, and the findings of Pedoski et al. (2016) that the most effective policies to attract and retain strong teachers are salary increases. They suggested professional support, improvement of teachers' preparation, improvement of working conditions. It is also consistent with the research findings of Tropova et al. (2020), who suggested that professional growth is an essential factor for teacher retention.

In the second part of the findings of the research, critical codes in the field of policies and interventions, in order of priority, include revision of courses and removal of unnecessary headings and lesson titles, preventing teachers from being assigned to other offices and non-profit schools, exceptional attention to Farhangian University and school organization. They would shrink and merge. In explaining the findings of this part of the research, it should be pointed out that the research of the high volume of content in the books is related to the academic progress of students (Joan Chalek; Jowan Chalek and Shukri, 2014) and creativity (Tawakkal Boghda and Marashi, 2015). It has a photo relationship. Therefore, the expert review of the content of books and

the removal of essential items and unnecessary courses will also reduce the need for teachers and is a step towards solving the teacher shortage problem. Also, assigning education to other organizations, including non-profit schools, will increase the burden of education problems in providing teachers, so not agreeing with the assignment of teachers can compensate for part of the teacher shortage problem.

Also, pay attention to Farhangian University as a university that has the task of providing and training teachers, administrators, and efficient employees needed in the style of the Islamic Republic, empowering and promoting the specialized competencies of the human resources of the Ministry of Education with an emphasis on cultivating pious, entrepreneurial, creative forces in the production of science (Faranghiyan University, 2022) is essential; Farhangian University is facing countless challenges in this direction, including the lack of educational space, faculty members, budget, and many other things. Therefore, special attention to Farhangian University can be a long-term plan to solve the teacher shortage problem in the coming years.

The findings of the research below in the category of incentives and financial support, in order of priority, include reforming teachers' salaries and the coordinated payment system, improving the quality of teachers' livelihoods to create incentives to attract people, providing special banking facilities/housing subsidies to educators, providing high-level welfare services to Cultivators and the creation of an all-round support network for teachers have been proposed. It is no secret that one of the most important reasons for the lack of teachers in Iran is the low salary and lack of necessary support for this group, which causes the departure of troops and the lack of motivation for the entry of young troops. Various research studies show the role of financial support in making this profession more attractive. Improving the status of teachers financially, increasing salaries that reflect the level of education, expertise, and job demands, and performance-based payment systems can be considered to reward teachers. Comprehensive benefits packages, such as health insurance and retirement plans, can also contribute to the

overall attractiveness of a teaching career (Allegretto & Mishel, 2020). Also, housing assistance or subsidies can be offered in areas with high living costs (Yun et al., 2020). Therefore, unless serious attention is paid to the salaries and benefits of teachers, the country will always face a teacher shortage crisis.

In the continuation of the discussion, the research findings showed that in the category of recruitment strategies, there are also essential factors that can contribute to the shortage of teachers. Hiring elite and efficient managers at all management levels, reforming the recruitment system, and reducing strict recruitment criteria in the selection department had the highest frequency, respectively. Compared to other interpreters, the strict recruitment criteria in Farhangian University's education and training cause people's inclination toward education and Farhangian University to decrease. Therefore, adjusting the employment criteria and coordinating it with the country's employment conditions increases the possibility of recruiting more efficient forces.

According to other research findings, promoting teachers' status in society (using all media and improving livelihood) and the independence and immunity of teachers' parties and organizations are also essential. The position of teachers in society is stagnating daily due to their livelihood problems. On the other hand, the union's protest against rights and benefits has been going on for years and has not reached a specific result. The combination of these factors has dramatically reduced the tendency of young people to do this job, so paying particular attention to these factors and improving the position of teachers in society requires great and all-round efforts from education, radio, and other related interpreters.

According to the research findings, in the human resources category, factors such as reducing the number of support and administrative staff, using the capacity of student teachers in other universities, and shortening the study period (fellowship) had the highest frequency. Coordinating with other universities to train the human resources required for education can be an essential

solution to solve the teacher shortage. According to the statute of education and training, equal to article 28 of the statutes of Farhangian University, provision of part of the needs of education and training in fields that cannot be developed and provided through Farhangian University, according to the rules and regulations of the Ministry of Education, from among the graduates of other universities and higher education institutions. The country's and seminaries' research depends on passing a one-year skill training course at Belamae University (Farhangian University Statutes, 2013). Also, shortening the study period for capable fields can facilitate the faster entry of student teachers into schools.

In the end, considering Iran's education system has also faced the challenge of teacher shortage in recent years, it is imperative to study and solve this problem by examining experts' opinions and identifying the existing potential. Paying attention to all the factors obtained in the research and implementing them individually can help solve this problem. Therefore, it is suggested that agents, planners, and human resource managers of the Ministry of Education and other regions use these methods according to their conditions and take steps to reduce the teacher shortage challenge.

In this regard, based on the research findings, the following suggestions are presented.

- Disagreement with assigning teachers to non-profit schools or other organizations
- Addressing the lack of educational space in Farhangian University campuses in Alborz province to attract more students
- Recruiting professors in proportion to the increase in the number of new students
- Increasing the budget of Farhangian University
- Providing special banking facilities/housing subsidies to scholars
- Providing high-level welfare services to educators
- Reducing the number of support and administrative staff
- Using the capacity of student teachers in other universities

- Shortening the study period for capable fields can facilitate the faster entry of student teachers into schools.

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