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Designing a Knowledge Dissemination System to Help Develop Secondary School Principals' Professional Skills

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ABSTRACT

This research aims to provide a knowledge dissemination system for the development of the professional skills of managers. This research was a mixed methods of sequential exploratory type. The research method was a case study in the qualitative part and a descriptive survey in the quantitative part. The statistical population included all secondary school principals of different schools in Tehran, totaling 1171 people. The sample (20 people) was selected by a purposeful sampling method and resource-oriented technique in the qualitative section. Quantitative part sampling was done by multi-stage cluster sampling and the sample size was 181 people according to Cochran's formula. In the qualitative part, the data collection tool consisted of two parts, a semi-structured interview and a single-question questionnaire, in the quantitative part, a researcher-made questionnaire tool was used to collect data. Data analysis was done in the qualitative section based on thematic analysis in ATLASTI software. Also, in the quantitative part, confirmatory factor analysis was used to analyze the data and structural equation modeling was used to determine the fit of the model. Spss-23 and Lisrel-8 software were used in the quantitative section. The obtained results led to the identification of 29 sub-components and 6 main components and finally the research model was presented. The dimensions include educational dimension (0.78), research dimension (0.70), service dimension (0.64), moral dimension (0.61), cultural dimension (0.57) and executive dimension (0.50). Bentler-Bonett's Normed fit index, relative fit, incremental fit, adaptive model indices showed that the designed structural model had a good fit.

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1. Introduction

The pace of creating new knowledge in the last decade has exceeded the speed of teacher learning and printed textbooks. Changes are synchronized or even preceded by them (Wu, 2022). The border of knowledge in the educational system is defined only by the knowledge in the teacher's mind and not in textbooks. In such a situation, educational managers cannot manage the educational system with stereotyped experiences and old knowledge. Therefore, the need to create and disseminate knowledge is felt (Xu & Li, 2022). Today, the competition between countries to gain a superior cultural-political position and to acquire a greater economic share in the numerous, diverse and fast-paced global relations has forced them to strengthen science and technology to expand the sphere of influence and national authority. In addition, education is facing many changes in the field of economics, politics, and society (Durst & Zieba, 2019). Increasing international competition, diverse students, increasing demand from industrial societies, reducing budgets, and rapid technological developments are the main factors of change in this environment (Lisa et al., 2016). These changes show that education in the era of an information-oriented society has increasingly changed from centralized systems to universal systems (Rofiaty, 2019). In such a situation and facing the ever-increasing challenges of today's world, the educational system should pay more attention to the growth and promotion of capable human resources with high professional ability in the form of programs to promote and develop the professional skills of managers in schools to advance its goals through appropriate training and changes in existing traditional teaching and research methods, scientific reasoning, evidence-based problem-solving methods, semantic and content connections of fields in this context for students. (Borah et al., 2021).

Manager's professional skills include analytical skills, feedback, active listening, language skills, respect for others, emphasis on empowerment, empathy, social agent

support, information transfer, collective problem solving, customer focus, self-control, respect for other cultures, flexibility, guiding organizational changes, professional knowledge, development of self-focus, development of a focus on others, ethical behavior, the opportunity for equity rights and support for diversity (Kashmiri, 2021).

As seen in the above definition, professional development is more focused on the processes of learning skills and updating information. Also, they focus more on the development of educational programs instead of being analytical tools for continuous education following changes in knowledge and new technologies (Rashedi, 2019). In other words, the professional development of teachers is often designed and implemented based on the structural dimension of educational systems and is recognized as an organizational responsibility, not an individual concern (Latilla et al., 2018). Knowledge, applied knowledge, and retained knowledge play a role (Torabi & Jamshidvand, 2022).

The importance of the role of knowledge in the development of the professional skills of managers comes from the fact that if managers have a good level of knowledge development, then it can be expected that they will use other school resources well and continuously improve the quality of their activities. different missions of education occur (Abubakar et al., 2019). Developing the professional skills of secondary school administrators is one of the important factors for maintaining the quality of school services and products; In fact, having managers benefiting from high-level skills is the main core in the quality of educational institutions (Copur-Gencturk & Thacker, 2021). Without efficient managers, schools will not be able to continue the educational improvement of their students and respond to the needs of society. When society demands accountability in education, the growth of managers should be considered one of the important concerns of managers (Bakhtiari et al., 2019). On the other hand, in the education system, managers play a special role as the main factor directing intellectual

and social capital, not only at the level of educational groups, and schools but also at the level of the country (Huang et al., 2019). Therefore, the development of professional skills of managers based on knowledge is of prime importance in school management (Karimi et al., 2021). In order for this field of human resource management to be placed in its proper place, change and transformation in the human resource management of schools with intellectual capital evaluation indicators in knowledge management is necessary (Wang, 2020). Doing this can make education systems more efficient and effective. (Esmaili Mahani et al., 2019). In short, it can be said that the need to grow and develop the professional skills of managers with the dissemination of knowledge is undeniable for four reasons.

The most important reason for this is to help administrators in order to design teaching, research, and service delivery. The second reason is the need to develop the skills of managers and students and improve the quality of education. The third reason is society, that is, the platform in which educational institutions continue to exist with the steps of knowledge development and provide the services needed by this platform.

The fourth reason is the technological advances and knowledge tools in the field of education and learning, which make the development of the professional skills of managers even more necessary.

Therefore, currently, organizing and managing the process of developing the professional skills of managers based on the components of knowledge dissemination has turned from a choice to a necessity for schools. Therefore, this research is looking for an answer to the question that how the knowledge dissemination system for the development of the professional skills of managers is, taking into account the secondary school principals of Tehran.

2. Literature Review

Professional skills of managers

While management is a job, it is also a profession that requires professional skills

(Zhao, 2010). The manager should find professional authority in the form of personal expertise, knowledge, information, and skills at the right time (Hislop et al., 2018). When management operations are based on professional authority, employees are expected to respond to common endeavors, accepted professional principles and rules, and internalized expertise (Latygovskaya et al., 2018). Professionalism has two dimensions, one of which is knowledge, expertise, and competence (Rounak et al., 2020). The assumption of professional authority in this dimension is that the skill and expertise of the manager are important. The other dimension includes a criterion for behavior that has a pious state and a commitment towards excellence that has an ethical aspect. Therefore, professional work is both a service based on skill and observance of piety in practice (Siewseeng et al., 2021).

Manager's professional skills are related to educational information and attitudes, in general, in the field of professional skills, the manager must acquire deep and comprehensive information in the following fields and use them (Hodhodi, 2018).

Knowledge dissemination system

The knowledge dissemination system is the localization of knowledge based on the current issue in the organization. Choosing a suitable solution among different systems in the field of knowledge management is a difficult task; Choosing a system that is responsive to the organization by considering aspects such as knowledge content size, security, facilities, and most importantly cost (Aneela et al., 2021). The use of knowledge management systems makes the process of searching and obtaining information faster. If there is no shared environment between employees to maintain organizational content and knowledge, people will get confused and each of them may try to produce duplicate content and knowledge; This process can cause the business to incur additional costs and the employees do not feel good about working in that organization (Shujahat et al., 2018). The existence of a knowledge dissemination

system in every organization and business makes sharing and accessing the knowledge of team members easy and fast (Kálmán et al., 2020).

Jalai-far and Abdullahi (2021) conducted research titled identifying the professional development competencies of newly hired principals of public schools in Tehran. Finally, educational, research, organizational, individual, moral, value, service, and international competencies were identified as competencies for the professional growth of newly hired managers.

Sedighi et al. (2021) in their research entitled prioritizing the dimensions and components affecting the professional development of medical education managers in third generation schools based on the hierarchical analysis model, classified dimensions of the professional development in six categories: leadership skills (0.238), management skills (0.203), individual skills (0.174), contextual skills (0.165), research skills (112) 0/0), and educational skill development (0/108).

Adli (2021) identified the key components for the establishment of knowledge management for the sustainable professional development of teachers in four categories: knowledge leadership, knowledge-friendly culture, design of the knowledge-based structure, and advanced technology in schools.

Källestedt & Letterstål (2020), in a study titled 'Comparing Perceived and Observed Learning from Professional Development Relationships Among Self-Reported, Direct Assessments, and Teacher Characteristics', found no meaningful relationship between teachers' self-reports and direct assessment of their learning. Tran & Nghia (2020), in their research titled Leadership in International Education: Leaders' Professional Development Needs and Tensions, found that the social context in which these leaders operate, including governance and existing structures, financial constraints, and institutional culture, internationalization has not been prioritized in the institutional development programs.

The lack of due attention to internationalization creates tension for their continued professionalism. This study showed that the basic need is to deal with obstacles and support continuous professional learning of leaders in order to strengthen their capacities as the main players in international education. Bilal et al. (2019) presented a study titled the impact and effectiveness of the faculty development program in cultivating faculty knowledge, skills, and professional competence: a systematic review and meta-analysis. This study reported an average effect size of 0.73, which indicates a positive and significant effect of competence in increasing the knowledge and professional competence of professors. This article emphasizes the integration of competence in all healthcare institutions to improve the academic performance of professors, thereby enriching the knowledge and skills of learners.

Therefore, considering the importance and necessity of developing the professional skills of managers, which in itself is the basis for sustainable and all-around development, the implementation of the present research is necessary from both theoretical and practical aspects. According to the raised discussion, it can be expected that examining the dimensions and components of the development of professional skills can lead to the growth and development of managers in performing their duties. Since no research has comprehensively examined the various dimensions on the development of the professional skills of secondary school managers, the current study is aimed at filling this gap in the literature. Among the other achievements of the model presented in this research is helping to make accurate and efficient decisions about the development of the professional skills of secondary school principals.

3. Methodology

This research was a mixed method of sequential exploratory type, which was done in two parts, qualitative and quantitative. The descriptive model of this method was based on the description of Creswell (2014) as can be seen in Figure 1.

According to the objectives and the nature of the research problem in line with "designing and evaluating the model of development of professional skills of secondary school principals in Tehran," this case study is in the framework of interpretative paradigm and mixed-methods methodology.

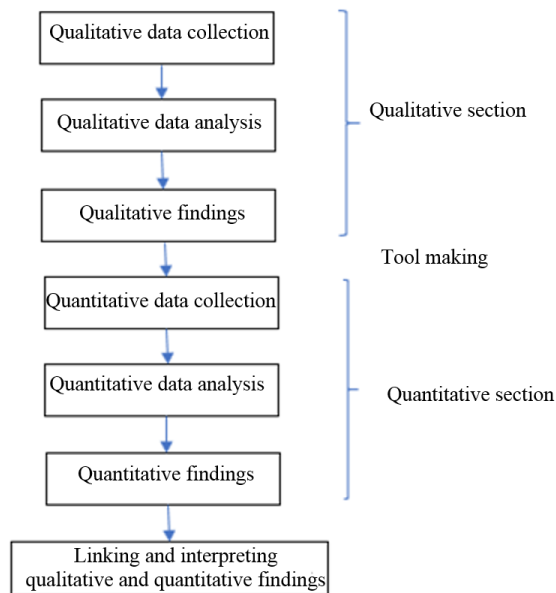


Figure 1. Sequential exploration strategy

The population of the qualitative section included experts, specialists, and knowledgeable people in the field of professional development and growth, second secondary school principals, principals, and officials of various educational units in Tehran in the academic year 2020-2021. Participants were selected by purposeful sampling method and criterion-based technique, with the criterion of having a doctorate and at least fifteen years of teaching, research, and management experience in different educational courses. 20 people were selected as a qualitative sample. Data was collected with a semi-structured interview tool and were analyzed using thematic analysis in ATLAS TI software.

At this stage, based on the themes obtained from the qualitative part of the research, a survey questionnaire was prepared to evaluate the model from the point of view of experts and review the upstream documents

and training documents, and it was approved by the thesis research team. The second part of this research used a quantitative design, which was carried out with the aim of evaluating and fitting the proposed model obtained from the qualitative part. The statistical population of this research included all secondary school principals who were engaged in teaching or executive and managerial activities in different educational units in Tehran in the academic year 2011-2021. Considering that there were 1171 active schools in Tehran. The statistical population was 1171 people. Sampling was done by simple random method and using Cochran's sample size formula. 181 people were selected and the questionnaire was distributed among them. To answer the research questions and check the fit of the model, structural equation modeling was used and absolute fit indices, comparative fit indices, and parsimonious fit indices were performed using Lisrel-8 software.

4. Findings

In this research, the thematic analysis method was used to identify and analyze the dimensions and components of the development of professional skills of secondary school principals in the qualitative section. This method has an interpretative and step-by-step nature and is a process by which scattered data can be transformed into rich and meaningful data.

Using Stirling's (2001) method, the process of conducting this research was carried out in three stages:

- Shredding text and coding quotes,
- Exploring the network of themes from the text
- Integrating discoveries and presenting the research model.

The statistical description of the characteristics of the participants of the library department and the field department (based on academic rank, education, gender, age, and work experience) is presented in Table1.

Table 1. Demographic statistics of the participants of the qualitative section

	Frequency Percent	Frequency	Level	Variable
Field survey	65%	13	Senior	Science ranking
	20%	4	Connoisseur	
	15%	3	Excellent	
	100%	20	P.H.D	Education
	20%	4	Female	Gender
	80%	16	Man	
	15%	3	Below 45 years	Age
	30%	6	45 to 50 years	
	30%	6	51 to 55 years	
	25%	5	Over 55 years old	Work Experience
	25%	5	Under 20 years	
	45%	9	20 to 25 years	
	30%	6	Over 25 years old	

First, a framework for classifying was chosen for breaking the text into primary codings. The framework of the primary coding stage and extracting the base themes were data-based descriptive; i.e. first primary themes was done. Table 2 shows the summary of the implemented steps codes and then base themes were identified based on the research data. Since the framework was theory-oriented, the keywords were

selected based on the theories and studies. In the first stage, quotes were extracted from the interview transcripts from an open interview, and also by studying and reviewing the upstream documents and key training documents and data-oriented coding was done in separate tables. In the last stage, by abstracting a theme that governs all themes as an overarching theme, the final compilation of the table of triple.

Table 2. Thematic analysis of the data

Row	Organizer themes	Basic themes	Overarching theme
1	Educational	educational credit	Professional skill development
2		Educational effectiveness	
3		Educational innovation	
4		The elite of educational content	
5		assessment	
6		Educational Technology	
7		Teaching method	
8		Knowledge update	
9	Research	Scientific productions	
10		Impact of research	
11		Research validity	
12		Research innovation	
13		Research skills	
14		Research technology	
15	Services	Service to the community	
16		Service to schools	
17		Serving students	
18	Executive	Executive activities	
19		Participation in the development of science	
20		Membership in scientific groups	
21		Management skills	
22	Cultural	Cultural values	
23		Cultural influence	
24		Cultural activities	

25	Ethical	Educational ethics	
26		Organizational ethics	
27		Social ethics	
28		Research ethics	
29		Public morality	

Demographic characteristics

In this section, the descriptive statistics of the examined sample are shown in the quantitative section (Table 3).

Table 3. Demographic data for participants in the quantitative section

Variable	Frequency	Frequency percent	Category
Gender	62	34.2	Female
	119	65.8	Man
Age	23	12.50	Less than 36 years
	71	39.40	45-36 years
	51	28.20	55-46 years
	36	19.9	Over 55 years old
Job position	41	22.70	coach
	128	70.86	Assistant manager
	10	5.52	Associate Professor
	2	0.92	Manager
Work Experience	32	17.8	Less than 10
	58	32.2	10-20
	51	28.5	21-30
	40	21.5	Above 30

The research used confirmatory factor analysis to investigate the causal structure between hidden variables. To investigate the relationships between hidden variables and observed variables, structural equation modeling was used.

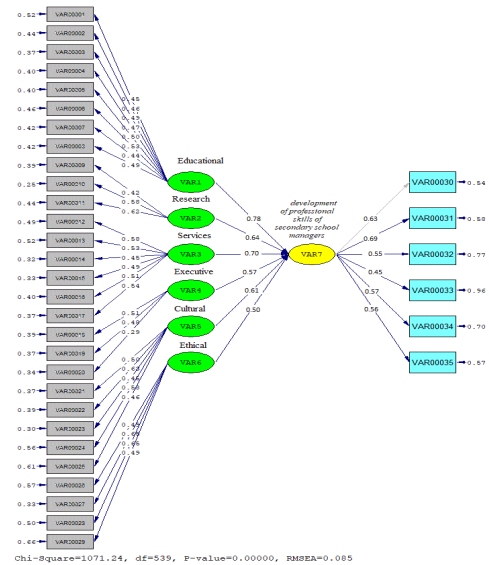


Figure 2. Factorial values of the measurement model for the development of professional skills of secondary school administrators

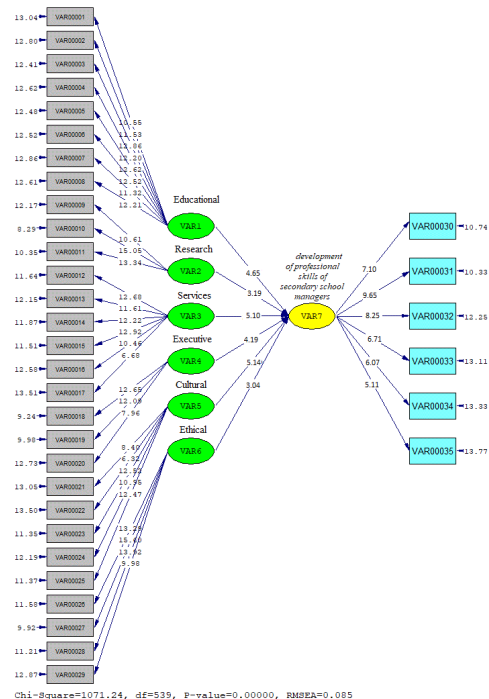


Figure 3. T-statistic values of the measurement model for the development of professional skills of secondary school managers

As seen in Figure 3, all factor loadings are higher than 0.3, so the relationship between the variables is favorable. Bentler-Bonett Normed Fit indices, relative fit, incremental

fit, adaptive indices and perfect square were used to express the acceptability of the

model, and the results obtained from the model are shown in Table 5.

Table 4. Variable fit indices of the model

PCLOSE	AGFI	SRMR	RFI	IFI	GFI	CFI	NFI	RMSEA	X2/df	Model
<0.05	<0.8	<0.09	<0.9	<0.9	<0.9	<0.9	<0.9	0.1>	5-1	Acceptable amount
0.082	0.97	0.13	0.91	0.93	0.96	0.99	0.98	0.085	1.987	Calculated

In general, considering all the fit indices, it can be said that the model has a good fit. Further, after designing the structural model between the variables, the effect of each of the identified educational, research, services, cultural, ethical, and executive variables on the professional development

of secondary school principals were measured. Factor loadings indicate the degree of influence of the observed variable in explaining and measuring the related hidden variables. Also, according to the factor load values obtained, the variables were prioritized. The results can be seen in Table 5.

Table 5. Standard loading of the influence of identified factors

Priority	t	Factor loading	Effect	
1	4.65	0.78	Development of professional skills of secondary school administrators	Educational
3	3.19	0.64		Services
2	5.10	0.70		Research
5	4.19	0.57		Cultural
4	5.14	0.61		Ethical
6	3.04	0.50		Executive

5. Discussion

The present research was conducted to design a knowledge dissemination system for the development of the professional skills of secondary school principals. It was aimed to provide solutions and models related to knowledge management to keep pace with knowledge in the third millennium for improving management methods. In fact, the main objective of the current research is to provide a suitable model for the application of knowledge management for the development of professional skills of managers, which includes philosophy and goals, theoretical foundations, perceptual framework, stages of model implementation, evaluation system, and reengineering. With a systematic view, it can be seen that educational institutions in education, like other schools and educational institutions, have special goals such as educational, research, cultural, ethical, executive, and social service goals.. One of the most

important resources of schools is the knowledge and skills of their principals. Considering their important role in the training of specialists and the provision of specialized and social services, need continuous improvement and growth. Schools in Tehran are not exceptions to this rule, so in line with their goals, and missions, knowledge based assessment should be carried out according to the upstream documents and education documents for the professional growth and development of secondary school principals.

Of course, it is better to make evaluations and give feedback in all stages according to the goals and expectations. Also, considering that society always has a dynamic movement and is changing and evolving according to different cultures and conditions, all these steps should be reviewed and revised regularly.

Lack of suitable educational spaces for acquiring knowledge and learning; Appropriate databases for knowledge

storage and sharing, lack of space for collective learning, knowledge sharing, and practical knowledge acquisition, and weak and inappropriate education technology are serious obstacles to professional development.

6. Conclusion

In the context of explaining the components of the research, it can be said that one of the main responsibilities of secondary school principals is teaching and managing the teaching-learning process and the dissemination of knowledge, that is, principals should have enough mastery of the educational content and subjects and update their specialized knowledge. It is necessary to establish the knowledge of the administrative system through the application of the principles of knowledge management and information integration, based on the principles of professional development. Also, they should be familiar with the new methods and techniques of learning and knowledge exchange between the manager and the student and have the ability to use smart classroom equipment, new information, and communication technologies in education, and use new targeted and standard evaluation methods, to provide more effective training. Based on the results of the present research, it is suggested that to increase the compliance of the programs with the principles of education and learning, school principals should be trained and upgraded through the Managers Development Centers.

Today, the sustainable and all-around development of the country revolves around schools and efficient and responsive educational and research systems, since human development is the main pillar of cultural, economic, and social developments.

Therefore, scientific innovations using new technologies have important roles. It seems that the education system fare from the knowledge management paradigm and its application to the professional development of school managers.

Meanwhile, to achieve a successful educational system, and to keep schools up

to the global standards, it is necessary establish a knowledge management system.

Aneela et al. (2021), showed that by planning based on organizational knowledge and information, the field of personal development and creating professional development for managers is created. Adli (2021), considered the establishment of knowledge management system essential for the professional development of managers. Hislop et al. (2018), pointed out that knowledge management is the foundation of organizational development and professional development for human resources. Wu (2022), showed that the development of knowledge is necessary for the educational system by establishing a knowledge management system.

School administrators and officials should have a comprehensive and systematic look at the professional skills development programs. Besides special attention to the educational, research, and specialized services that are part of the mission of education, other aspects of the development of the professional skills of secondary school principals, including executive, cultural and ethical aspects, should also be included in secondary school principals' professional skills development programs. The proposed model of this research can be used as a basis for developing regulations for the promotion and professional development activities of secondary school principals in different schools in the country.

Thus, based on the presented model in this research, in order to spread knowledge for the professional development of managers, the following suggestions are made:

- Due to the important role of managers and educational leaders in the establishment and dissemination of knowledge, in order to gain awareness and insight into the concept of knowledge leadership and its implementation, knowledge management training workshops should be held for various managers of the educational system.

In order to update their knowledge in the field of education and research, managers need to be familiar with the new methods of teaching and research in top world schools.

- Today, one of the goals of the fourth generation schools is to support innovation and nurture creative graduates to produce wealth and value. So, it is suggested that managers direct their research activities in line with the development of knowledge-based, local, regional and national economies and provide the basis for sustainable growth and development of the country and global competitiveness

- Due to the importance of organizational culture, planning for cultural changes should be done in order to promote a knowledge and knowledge-friendly culture.

- The organizational structure suitable for the dissemination of knowledge is quite important. Therefore, it is suggested that the changes to the structure of the educational system need to be taken into account.

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