Provide a model for Designing Teachers' Professional Development model in Education

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Abstract

Purpose: The aim of this study was to present a professional development model for high school teachers

Methodology: The research was applied in terms of purpose and exploratory in terms of mixed method. In the qualitative section, the statistical population included all experts in education and training sciences in Tehran. A sample of 15 people was selected by purposive sampling using the principle of theoretical saturation from the above community. In the quantitative part, the statistical population included all high school teachers in Tehran that 382 people were selected by stepwise cluster sampling. In order to collect data in the qualitative part, an in-depth semi-structured interview with 5 open-ended questions was used and in the quantitative part, a researcher-made questionnaire was used to design a professional development model. Qualitative data analysis was performed using thematic analysis method and partial least squares method was used to analyze quantitative data.

Findings: The research findings showed that the components of professional development according to experts included three dimensions of professional knowledge, professional commitment and professional ability. The results of factor analysis on 25 items of the professional development model showed that the factor loads of the items of each factor and the relevant t-index had a factor load of more than 0.4. Also, in order to determine the reliability of data collection tools, Cronbach's alpha method was used. The values of these coefficients for all variables were above 0.7, which indicated the appropriate reliability of the questionnaire.

Conclusion: According to the research results, there is a strong link between the role of human capital and the development of countries. Human capital growth is a set of knowledge, skills and characteristics that lead a person to individual, organizational and social success.

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1. Introduction

The different needs of students in cognitive, emotional, social, communicative and motor areas have increased teachers' challenges to increase student outcomes (Coleman, Gallagher, 2015). They say how to get the best results to solve classroom problems (Lucas, Frazier 2014) One of the concerns of teachers is how to provide comprehensive education, which includes all the needs of students. (Navarro et al 2016) Teachers need information and equipment for students (Lucas, Frazier, 2014). Teachers need to diversify learning, change, to meet the different learning needs of students (Sharma & Nuttal, 2016). Sharma and Natal suggest that higher education is essential for teachers because it improves attitudes, their self-efficacy. Have a teacher in the classroom and create positive effects for students (Siegle, Rubenstein, Mitchell, 2014).

Coleman & Gallagher (2015) research showed that teachers need new content, postgraduate education, for their professional development. They are interested in participating in educational programs, online services and applications. (Darlen, et al, 2017) Teacher professional development changes the teaching method and improves students' learning outcomes. Teacher professional development through credible structures, interactive activities and other strategies, for in-depth teaching and learning is considered. Lecture-Based (Chuck Koval, et al, 2017) Teacher Professional Development is a source of information to update teachers' skills in a variety of contexts and to assist teachers in their professional development if learning opportunities, knowledge, skills are provided in schools and classrooms, Teachers 'performance will also improve (Khan, Begum, 2012). Researchers have shown indicators for teachers' professional development. According to the Office for Quality Improvement and Strategy, teacher components and standards should be such as to enable teachers to meet Understand students 'different emotional, social, and educational backgrounds, and change teachers' abilities in terms of knowledge, skills, and attitudes (Laei, 2012).

Using data collected from the National Statistics Center (2017), 50% of teachers have spent only a day or less on a professional development program. Teachers are less inclined to implement it to improve the quality of their education (Koval Chuck & Vorotnykova, 2017). Research on teacher awareness has shown that there are significant differences in formal teacher skills (Alexander & Lyon, 1996). Teacher training has always been a challenge (Lin, et al, 2012) on professional teachers. It is not clear how they are trained, how they are educated and what makes them a capable and professional teacher (Villegas-Reimers, 2003). There are many benefits to teacher training in the world, but little has been spent on it. There are research concerns. (Lunenberg, 2010) On the other hand, given the considerable importance of proper education in society, the need for skills and knowledge for survival and success is very high. (Jafari, 2016) So the researcher seeks to know what is the appropriate model of professional development for teachers?

Teachers are not only one of the variables that need to change in order to improve educational systems, but they are also the most important factor causing change. This dual situation of teachers in educational reforms, as one of the main elements and implementers of change, has made teacher professional development a growing and challenging field. But at the heart of these efforts, in order to recognize common professional development, is teacher learning, learning how to learn and transfer knowledge to action to help students progress. New approaches to professional development favor lifelong learning and do not see vocational learning as short-term interventions, but as long-term professional development of teachers ranging from teacher training at university to in-service teacher training (Richter, et al, 2011). Numerous studies have been conducted in this field and different models have been presented. Gallo et al (2016) in their research with the aim of "participatory teaching" for the professional development of teachers, have introduced participatory teaching. In their view, this model provides opportunities for teachers to share in the responsibility for student learning. Tan & Ang (2016) in their research, they presented and evaluated a "school-based professional development program" aimed at developing teachers' competencies for teaching mathematical modeling in Singapore. This model was based on two main

features. One was the content element for developing teachers 'knowledge and skills and the other was the evolution of teachers' learning cycle for inference, representation and reorganization; data analysis showed the positive effect of this model on knowledge, planning, design and implementation of modeling learning experiences. . Girvan et al (2016) in a research aimed at the role of experiential learning in teachers' professional development; The use of experiential learning has been explored during the early stages of teachers' professional development; In this way, after observing the students' results from the very beginning of teaching, teachers, as learners, experience new educational approaches and implement them in their classrooms; This study was conducted with this approach among Irish high school teachers who wanted to make significant educational changes as part of major curriculum improvements. The results of feedback, observations and interviews showed that the process and results in teachers' beliefs Buczynski & Hansen (2010) also showed that the professional development of teachers increases their content knowledge, the use of research-based teaching methods in the classroom and the improvement of students' learning. Be. Sysko (2018) in the article Professional Development of Teachers under the Conditions of Lifelong Learning, the teacher's ability to reflect, motivate, responsibility and academic mobility, are considered as professional development needs.

Bradford & Braaten (2018) in a study showed that teacher evaluation and their underlying factors suggested components, teachers 'professional competence, professional identity and evaluation processes as components of teachers' strengthening or weakening. In this regard, Ping et al (2018) considers the professional training of teachers as components, professional learning, knowledge base, teacher educators as the needs of professional development. Bourke et al (2018) In response to the question of how teachers use their professional practices, the needs of professional development were expressed by speech analytical techniques, professional standards, discourse analysis and analysis. On the other hand, Alberth, et al (2018) in the article Social media for the professional development of teachers in the digital age: components of cyberspace, social media, dynamic interaction and cooperation of teachers suggested.

2. Methodology

The present study is an applied research in terms of purpose and in terms of data collection was a mixed exploratory type. The data collection method was descriptive-survey method. The statistical population of the present study was in the qualitative part of experts and specialists familiar with the research topic. In this regard, 15 people who were in line with the research goal were selected to reach the theoretical saturation limit. Sampling in the quantitative section was a stepwise cluster; the sample size in the quantitative section was 382 people. The statistical population of this study consisted of all secondary school teachers in District 5 of Tehran with a population of 6400 people.

The method of data collection in the qualitative part was as follows: through dialogue of experts and specialists and using the Delphi method, the basic model of professional development was extracted. A little research was done.

The data analysis method is based on Lisrel software and based on exploratory and confirmatory factor analysis method; thus, the results of items are reduced to different factors and the naming of new factors leads to a kind of rearrangement of components and dimensions; there is no acceptable reliability and the final model has been developed. Interview questions are listed in Table 1.

Table1. Interview questions

Row	Question
1	In your opinion, what are the indicators of teachers' professional development?
2	What are the ethical characteristics of teachers to enter professional development?
3	What knowledge and skills do teachers need for professional development?
4	According to the executive mechanisms, the professional development of teachers can be increased
5	In your opinion, what are the obstacles to implementing the professional development of teachers?

Findings from the analysis of the interviewees' answers were centered around the main goal and by linking the codes (open coding) the concepts (axial coding) were identified; and finally the research questionnaire was presented. The researcher-made questionnaire of servant leadership includes 25 items with a five-choice Likert scale, which has been compiled based on theoretical and practical principles and exploratory interview results (arm-centered coding of exploratory interview texts). This questionnaire includes professional knowledge (5 items), professional commitment (10 items) The face validity and content of the questionnaire were approved by experts in this field. In addition, to measure the validity of the structure due to the possibility of independent factors from each other, Varimax rotation method - one of the methods of exploratory factor analysis was used. The results obtained from the factor loads of the items of each factor and the related t-index showed that all the items had a factor load of more than 0.4. Also, in order to determine the reliability of data collection tools, Cronbach's alpha method was used. The values of these coefficients for all variables were above 0.7, which indicated the appropriate reliability of the questionnaire.

Table2. Related to the description of professional development and its components

Variables	Average	The standard deviation	Cronbach's Alpha
Professional development	70/49	15/24	0/897
Professional knowledge	17/33	4/36	0/837
professional commitment	24/17	6/63	0/833
Professional capability	28/98	6/99	0/827

The data obtained from the questionnaire were analyzed to develop the final model by exploratory and confirmatory factor analysis. Bartlett's test was identified on the existing index. Rami's research model can be seen for the variables.

Tabl3. Results of KMO and Bartlett test

Test	Coefficients	Result
KMO	0/888	
Bartlett	4084/74	KMO >0.500
Degrees of freedom	300	
Significance level	0/001	

Based on the results, the large kmo index is 0.6 and gives values close to one, which indicates the adequacy of the sample size based on the indicators identified for factor analysis. The significance level of 0.000 for Bartlett test also indicates the suitability of the research variable for factor analysis. After making sure of the ability to perform exploratory factor analysis, the analysis process begins. Exploratory factor analysis is performed by analyzing principal components and varimax rotation. Based on the research literature and expert opinions, they were categorized and the variables whose extractive subscription values are less than 0.5 were eliminated. The following is:

Tabl4. Components identified after using existing literature

Structure	Component Name	Number of indicators
Professional development of teachers	Professional knowledge	5
	professional commitment	10
	Professional capability	10

3. Findings

After identifying the model of professional development of teachers in education, the effect of the overt and covert variables identified on each other is examined, ie the conceptual model of the research is tested using confirmatory factor analysis which is examined with LISREL software. In order to confirm the significance of the relationship between the variables according to the bar graph, they have a factor higher than 0.4, which indicates the appropriateness of the criterion.
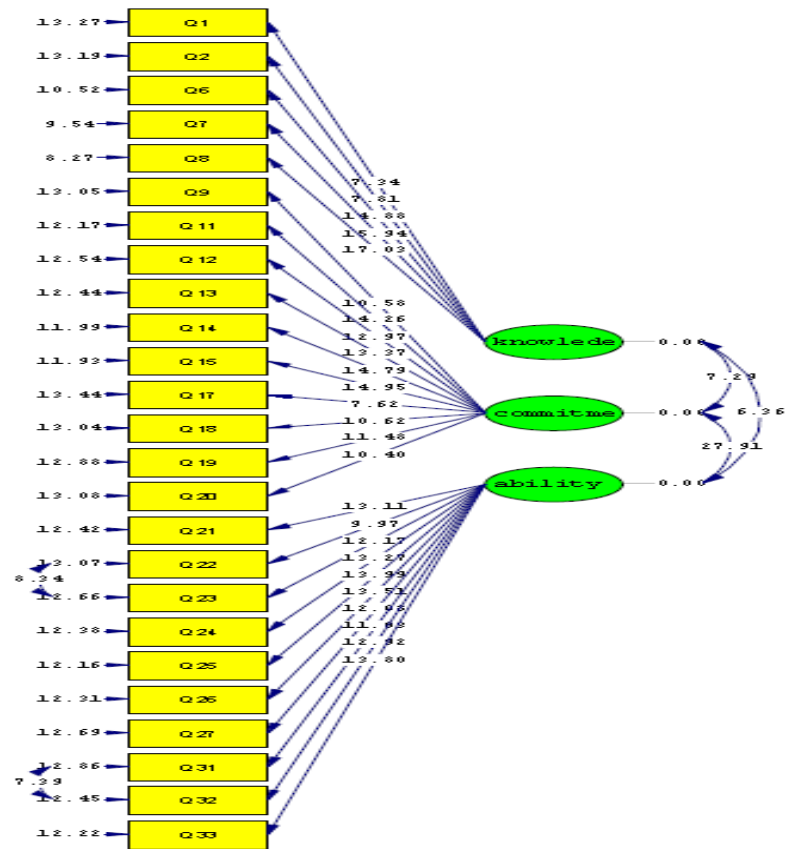
Chi-Square=1153.29, df=470, P-value=0.00000, RMSEA=0.073

Figure1. Professional development model in standard coefficients

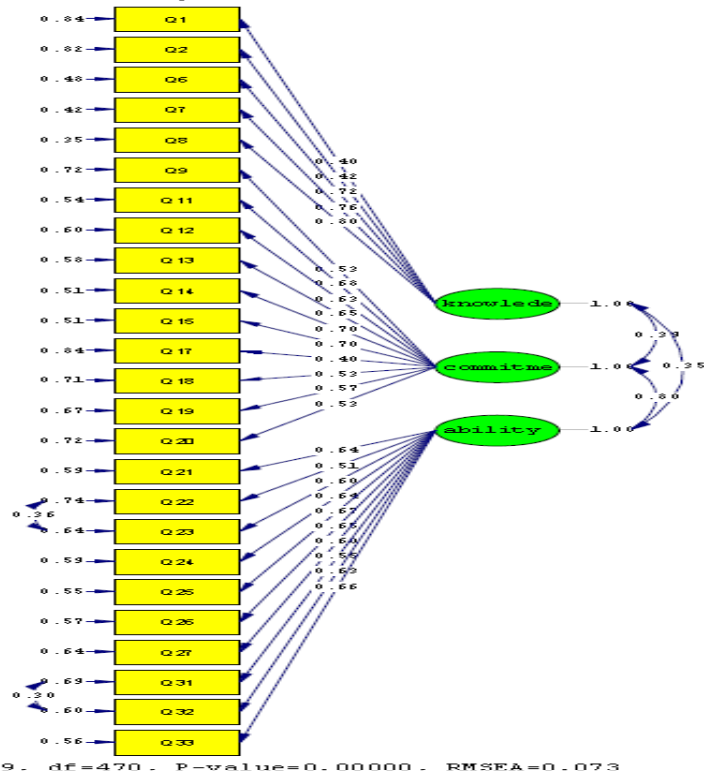Chi-Square=1153.29, df=470, P-value=0.00000, RMSEA=0.073

Figure2. Professional development model in standard coefficient estimation mode

Based on the diagram, the relationship between the professional development structure and the components was confirmed at the confidence level of 0.99, because the t-statistic for this route was more than 2.58. The following table lists the most important fitting indices. As can be seen in the table, all approximations of the index are statistically sufficient;

Table5. The model fits the proposed indicators

Fitting statistics	The allowable limit of the fit index	Initial model coefficients	Result	Modified model coefficients	Result
(Chi-Square)	Be less than 3	4/13	failed	2/45	Confirmation
RMSEA	Is less than 0.8	0/094	failed	0/073	Confirmation
NNFI	Is greater than 0.8	0/86	Confirmation	0/91	Confirmation
NFI	Is greater than 0.8	0/85	Confirmation	0/90	Confirmation
IFI	Is greater than 0.9	0/90	Confirmation	0/92	Confirmation
CFI	Is greater than 0.9	0/90	Confirmation	0/92	Confirmation
GFI	Is greater than 0.8	0/79	failed	0/81	Confirmation
AGFI	Is greater than 0.8	0/77	failed	0/80	Confirmation

As can be seen, the pattern fit indices are in good condition.

4. Discussion

The results obtained from the interview of experts indicated that the professional development model includes three categories of specialized knowledge, professional commitment, and professional ability. Professional knowledge includes the subcategories of specialized knowledge, technological knowledge, and educational knowledge. The present research on the components of teachers' professional development in the fields related to teaching, evaluation, general capability, educational, cultural and political context is in line with the findings of Twining (2013), Fakhari Ashrafi (2012), and Greenleaf (2011). Ethics, communication, leadership, professional learning are consistent with the findings of Bourke (2018), Erdas Kartal (2018), Allen (2015), Moken (2017), Darlen (2017), Šarić (2017). Technology, educational knowledge, specialized knowledge are in line with the findings of Simpson (2018), Teo (2018), Koval Chuck (2017), Jafari (2017), Ayoubi (2015).

Considering the results consistent with the findings of Ayoubi (2015), it can be said that specialized knowledge is a fluid combination of experiences, values, background information that provides a coherent and integrated framework for evaluating new information. Educational knowledge is: "Process Assisting the educator to make gradual change over time is in one of the physical, mental, emotional, and behavioral areas. They share their learning; the nature of professional learning is such that it requires a systematic search for evaluation. Leadership is the influential influence of others. Leadership is the power to attract students and influence students.

The findings of the present study are consistent with the researches (Khan, Begum, 2012; Laei, 2012) show that there is a strong link between the role of human capital and the development growth of countries. The growth of human capital, which is a set of knowledge, skills and characteristics that lead a person to individual, organizational and social success, has significant results; These include economic growth, increasing productivity, expanding and deepening domestic and foreign trade, technological developments, and the long-term survival of the organization. Given the dramatic changes in social organizational environments and the intensification of competition in today's world, organizations are more than ever looking to attract, retain and develop people to carry out their current and future processes. In recent years, achieving development has become a strategic concept in the strategic orientations of governments and nations. Francis Bacon considered power to be wealth, and in the third millennium, when the knowledge-based economy became the basis of development, the strategy of wealth production through the development of knowledge and wisdom was considered by scientists and the realization of sustainable development in general depended on human resource development. The return

on investment in humans through education is far greater than the investment in physical assets, because today, development takes its impetus from the brains, and it is scientists, experts, interns, and creators whose knowledge is the new foundation. Wealth is in competition.

Teacher professional development is "processes and activities designed to enhance teachers' professional knowledge, skills, and attitudes so that they can improve student learning" (Guskey, 2000). This definition gives a wide scope to teachers 'professional development; however, new approaches to professional development favor lifelong learning and do not consider vocational learning to be short-term interventions, but to consider teachers' professional development as a long-term activity. This ranges from teacher training at the university to in-service courses for teachers (Richter, et al (2011)).

Communication is a two-way street in which two or more people exchange thoughts, ideas, feelings, and facts. Ethics is a layer of human behavior that appears in his behavior with others. Another classification is professional competence with the following categories: general ability, teaching activities, educational, cultural, political, economic and economic context, evaluation. Professional ability refers to the ability of a person to perform specific tasks in a given situation. In other words, professional ability means that a person has sufficient knowledge and information, positive attitude and strong personality. In the educational system, professional ability of teachers means making changes in professional development activities required by teachers in different situations to improve their professional performance. The concept of subcomponents is professional ability as follows. General ability: Individual and general characteristics of teachers for career achievement Teaching activities: A set of activities that take place in a classroom situation with purposeful interaction between teacher, student and student, The political, economic, and cultural system that emerges from government policies and is influenced by the values that govern society. Evaluation: It is a process by which the achievement of educational goals for the teacher and the student is determined. In order for the student's performance to be properly determined, the teacher judges based on his or her own criteria and the extent of the change that has occurred in the student's behavior. In fact, evaluation is the last stage of the teacher's educational activities and complements his other activities.

In line with the results of this research, it is suggested that 1- specialized training courses for teachers be introduced to management development models 2- Support teachers' activities and actions by developing support and incentive guidelines 3- Codified development planning (needs assessment, development of continuous programs, appropriate content delivery) 4- Provide facilities for updating teachers 'information 5- Provide facilities for scientific progress (providing time for learning, helping teachers to continue their education) 7- Provide continuous evaluation of teachers' activities 8- Proper welfare and incentive facilities (Such as science trips, proper insurance, free use of kindergartens, round trip service) to be awarded to teachers.

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