International Academic Institute for Science and Technology

International Academic Journal of Humanities Vol. 2, No. 1, 2015, pp. 23-31.
ISSN 2454-2245

International Academic Journal of Humanities

www.iaiest.com

Identifying competencies of faculty members in Isfahan's technical and vocational colleges, a basis in order to attract empowerment and evaluation (Case study on Shahid Mohajer technical and vocational school)

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Abstract

The aim of this study is to identify the competencies required by the faculty members of Isfahan's technical and professional schools. The study is applicably target-wise, and its nature is based on survey method. The statistical society of this study is all the students in Mohajer technical and vocational school. Since we tended to apply exploratory factor analysis in this study to determine the effective factors, a sample of 400 participants was chosen via random sampling. The identified qualifications that were over 100 competencies were extracted by interviews made with faculty members, then put into a questionnaire, were replied by the students and by the use of exploratory and confirmatory factor analysis were analyzed. According to the results received by exploratory factor analysis we recognize three factors composed of: entrance competencies, general competencies, and professional competencies. These factors are set respectively into this order: 8, 30, and 18. The results based on confirmatory factor analysis also approve of these three qualifications.

Keywords: competency, faculty, technical and professional, exploratory and confirmatory factor analysis

Introduction:

One of the basic principles that assures the organization's quality is possession of qualified and expert manpower with appropriate quality indicators. Human resources as a responsible authority for the planning, organizing, directing and leading, monitoring and controlling, play an important role to promote the organization's noble objectives. The unique importance of human resources in the competitive position of any organization, make every authority considers human resources in respect to competitive advantage terms, as the most valuable organizational asset, because unlike other organizational resources, it does not dissipate or reduce by consumption. It is the only ever-growing asset that never amortizes but with the experience it adds to the better organizational performance. Peter Drucker, father of modern management believes that the greatest profit of future is countries and organizations' human resources. That's why the majority of our problems are regarding human beings and not resources and equipments (Rezayinejad).

One of the most important parts of education system in general, and higher education system in particular, are faculty members of universities more specifically. Applicability of the trainings, presenting technical skills and aptitudes required for the market, and ultimately a vocational basis for students' employment are the main objectives of authorities who designed technical and professional schools in Iran.

Organizations specially educational organizations in addition to their routine planning must consider human resources planning as well, since the most needed factor to have successful programs is having motivated and expert human resources, this is the reason why human resources programming is a must in all the organizations and is a tool that assists managers in this way. Manpower planning helps the organization to be assured of their human resources, its surplus, shortage of manpower in various sectors, and its balance. It ensures the organization of the right assignments of proper staff at the right time (Dessler, Parsayian,).

To understand the real position of professional training in today higher education, it should be noted that the world is facing with general trends in various fields such as globalization, development of knowledge, constantly changing technology and the important role of science in production. This has changed the skills and created new professions and the market is of great need to manpower with new or complementary skills (Stanserom, 2009). According to UNESCO definition, technical and vocational training in addition to general knowledge of all forms and levels of the educational process, including the study of science and technology related to the acquisition of practical skills, ability, and attitude and covers the vocational issues in economical and social life (Tapyen, 2002). But the basic question is whether the faculty members are qualified enough to provide the students with the required instructions or not?

The concept of competency has examined by many scholars with the varied views. Smith and Calling (2011) referred to Hauger (1998) have said that from behavioral point of view, the emphasis is put on the successful observation of effective vocational performances and the factors that make these performers stand out from their weaker colleagues. This view was initiated by Mcklend and evolved by Mcber consulting company. The second view is general view of identifying competencies. Hauger believes that general competencies have two chief characteristics: first direct attention to broader views on

competency, and second they are very sensitive to changes in the work content. In other words competency depends on the context and framework. Competency in this section, mostly defined in an overall performance framework and this framework is related to a special and proper task (Smith and calling, 2011). In the cognitive approach competency is assumed including all mental sources that are applied in individuals' main tasks and leads to acquiring knowledge and achieving better performance (Smith and Calling, 2011).

Europe commission in the document dated 06.09.2010 "new resolve in cooperation with professional education and training to support the Europe 2020 strategy" assumes the role of teachers vital in modernizing education, educational training with the focus on the recruitment conditions, professional development, and social position. In this document one of the factors that guarantees the quality and improvement of technical and professional trainings, is the competency framework and qualifications of the teachers and trainers (Esmaeili).

Simon (2009) has presented a classification of teachers' competencies that must be covered by them:

- Teachers require developing their vocational competencies in order to attain enough skills in technical and professional trainings.

- Social and pedagogical competencies to facilitate the process of teaching and working with students, and adults, especially in fostering the integration of educational tasks, supervision, participation in learning and knowledge transfer, are required.

- Teaching skills to combine work and learning, determining the learning opportunities in the field of business, comprehensive ability and guidance towards independent learning is required.

- Managerial competencies, allow the trainers to protect the processes related to training such as quality monitoring, project management, and working with training providers and other stakeholders.

- This competency is of more importance due to the decentralization in the process of education and training, integration of vocational training in a lifelong learning context and reducing number of students.

- And finally, competencies of personal development are related to trainer's satisfaction of professional and personal growth. This competency allows the trainer to set a goal and try to achieve it.

With these descriptions, is there any plan to identify competencies of faculty member of technical and professional? Thus the main problem in this paper is to identify the required competencies of faculty members in Tehran in order to apply it for appointing new members, development, and promotion. The basis of this study is the identified factors in Europe commission document.

Methodology:

In according to the main goal of study that is identifying required competencies for technical and professional schools' faculty members, initially we interviewed 11 faculty members and used the specialist's opinions, and studied foreign and domestic resources about the required competencies in other countries which are prominent in this field, all the required competencies and indicators were extracted after several Delphi screening processes and it leads to omission or incorporation of some of these competencies, it was set in the form of a questionnaire with five point Likert scale from the lowest bank (do not agree) to the highest bank (strongly agree) and it was presented to 400 of studebts in Shahid Mohajer technical and professional school and they expressed their ideas about the competencies mentioned in the questionnaire and finally with the use of exploratory and confirmatory factor analysis the competencies were examined. Houman describes that in exploratory factor analysis, researcher tries to discover the factors and their relationships via examining the experimental data and he does this task without imposing any distinctive model. In other words exploratory factor analysis can have either surveillance value or structuring, modeling and hypothetical value. Exploratory factor analysis is used when the researcher does not have enough empirical evidence for the hypothesis about the underlying factors of data and he indeed is interested in determining the number or quality of the factors that affect the interactions between the data. Thus exploratory factor analysis is mostly considered as a method to produce a hypothesis and theory not to examine it. In this survey because of the high volume of competencies identified and with respect to the study's goal that was discovering and identifying the indicators and their correlations, we have applied exploratory factor analysis initially, but in confirmatory factor analysis, researcher is about to find a model according to which empirical data can be described, elaborated on, and justified with a few parameters. This model is based on the pre-empirical information regarding data structure. The difference between exploratory and confirmatory factor analysis is that the exploratory factor analysis is the most economical method to explain the common variance of underlying correlation matrix, while confirmatory methods (hypothesis examining) determine that data with a specific factorial structure (mentioned in the hypothesis) are in harmony or not. In this survey after applying exploratory factor analysis, confirmatory factor analysis was used in order to determine whether the identified competencies are of one unique and harmonic factorial structure or not?

Findings:

To examine the validity of the designed indices, we applied Crenbach Alpha method to determine the validity of the factors that leads in omission of some of the identified competencies and the internal consistency coefficient was equal to 78/0. To determine the confirmatory aspect of the structure, we initially used exploratory factor analysis that caused to removal of more identified competencies and the ratio attributed to entering factors, general factors and professional factors of faculty members are mentioned in tables 1, 2, and 3 respectively. The results of factorial analysis for the mentioned factors calculated according to main factors analysis and Varimax rotation method show that considering a load factor greater than 3/0 and diagram slope, equity values, and variance percentage competencies were extracted.

Table 1: load factors, special value, determined variances amounts for entrance competencies

Entrance competencies	Load

	factors
Passing teaching internship courses (faculty) during studying and achieve the teaching competencies	78%
Familiarity with the students' characteristics	72%
The suitability of the course being taught with the academic course had been graduated from	71%
Mastery over presenting professional theoretical subjects and practical lessons in technical and professional school	70%
Familiarity with standard professional skills	69%
Having master degree or higher with the educational orientation in a technical course	61%
Passing the teaching skill training course	60%
Having professional certificate related to the academic studies (vocational competency)	53%
Determined variance	12/24
Specific value	11/7

Table 2: load factors, special value, determined variance for general competencies

General competencies	**Load factor**
Take the vocational and professional responsibility as much as possible	82%
The ability to combine academic, scientific and technical subjects	82%
Flexibility in different times and places	80%
The ability to play the roles such as technical laborer, psychologist, workshop manager, an expert and skillful person in his profession	78%
Having the basic computer skills(ICDL)	74%
Emphasis on ethical values: piety, patience, toleration, honesty, humility, justice, duty, bravery, dignity	74%
Valuing and right and fair judgments	74%
Acquiring professional and teaching certificates	73%
General competencies	**Load factor**

Good morals and serious, polite, and respectful behaviors with others specially students	71%
The ability to teach the students professional etiquettes regarding their job	69%
Understanding and applying psychology in these grounds: educational, learning and students' development	69%
Having skills in educational technology and using educational software in teaching	67%
Humanitarian skills: communication and work with students, the skill of making a constructive relationship	66%
Technical skills: science,methods,technologies and equipments' application skill	66%
Familiarity with the position of professional education in state or province	65%
Having aptitude in : attracting students' attention, presenting lucid lectures, planning questions with different cognitive levels, and goal-achieving, evaluation, and teaching revisal	64%
Effort to achieve personal and professional promotion	59%
Perceptual skills including: the skill and ability to understand the complexities of work environment, realizing the right time and place for taking an action, self position and performance	54%
Collaboration abilities with colleagues, learners, and participants in educational settings	53%
Students' assessments as per standards of education system, performance assessment not only grade-assessment	53%
Recognizing safety and security of the work specially in the workshop	53%
The ability to discover the innate motivations in students	49%
Playing an active role in teaching-learning process with the use of subject knowledge, content of program, ethics sciences, innovation, research and its cultural and social aspects	49%
Understanding and applying the basis and principles of teaching planning	44%
Familiarity with the education in virtual space	40%
The ability to run programs that grant the students a broader view about the professional and vocational world	40%
The characteristic of combining the application of IT and communication and education	38%
Ability to work with the society in levels such as local, national, domestic, international	37%
Special value	21/5
Determined variance	14/19

Table 3: load factors, special value, determined variance in professional competencies

Professional competencies	**Load factors**
The ability to apply teaching-learning techniques, scientific experiments, problem-solving, co operational projects or group-oriented activities, subjects which demand different methods of teaching and projects	89%
Mastery over the professions related to the academic course	86%
Mastery over presenting technical skills (main and professional subjects)	83%
Mastery over the professions related to the subject being taught	77%
Awareness of the vocational world related to the course graduated from	76%
Having enough information about vocational environment and transferring these experiences to students	73%
Familiarity with professional technical language	71%
The ability to connect educational concepts to professional world	69%
The ability to teach based on real profession in career	68%
The ability for developing vocational competencies for teaching practical subjects in professional world and technical skills	66%
The ability to combine practical and theoretical subjects	64%
Providing students with the opportunity of familiarizing with new professional standards	63%
The ability for preparing students for the market and ensuring their success	59%
Being experienced in his profession before working as a faculty member	58%
Familiarity with the professional software	58%
Having an objective-oriented education and based on the professional world	56%
Familiarity with international and national standard regarding their profession	53%
Special value	43/6
Determined variance	31/13

Attention: to examine the competencies: 792/0 = KMO, Bartlet's sphericity = 44/3124, degree of liberation = 344, 001/0<P

Then with the use off confirmatory factor analysis, the examining of identified competencies embarked on, generally for assessment of factorial model analysis there is a number of fitness characteristics and in

this paper we have used the following indicators and their equivalent values: K square (K2), 87/22, goodness of fit (GFI), 98/0, adjusted index of goodness of fit (AGFI), 97/0, root mean of square error approximation (RMSEA), 04/0. As it can be observed the indicators are of good level of acceptance and model is fitting the data given. Questions are congruent and an underlying factor called competency has been created for the questions. These identified competencies all together determine a variance of 56.57%.

Conclusion:

Needless to say, human resources is one of the most important factors to aid the organizations to achieve their goals and to promote profit-making, and attaining organizational objectives is based on human resources' capabilities. Specialists believe that in an organization manpower factors are more effective than other factors in the building of a firm foundation, maintenance, developing performance, and complementing of organizational mission. The quality improvement and profitability in the process of organizational evolution depend on the involving human resources factors. Thus it is necessary to identify talented individuals, select and recruit the competent manpower, in each and every level of organizational process (Dashgarzadeh). Faculty members of technical and professional colleges have an evident role to train and prepare a skillful generation in industrial field and development of human resources, thus the identification of factors that can enhance their competencies and qualifications is of grand emphasis. According to Hatamzadeh research in identifying competencies of technical and professional colleges' faculty members, suggests 8 factors fro identifying these qualifications. These 8 factors are as follows:

1- management and organizing educational environment skills
2- planning academic schedules and presenting lectures skills in class or workshop
3- basic skills
4- perceptual and thinking skills
5- skills related to professional and vocational world
6- communication skills
7- characteristics and personality skills
8- evaluation skills

These factors determine a variance of 70.64. These 8 factors are able to support recent findings. To operate a successful strategy of recruitment, realizing these concepts are very important whom you want to recruit and planning a strategy to attract more qualified individuals to apply for the recruitment. In fact, the building block for attracting competent manpower to the organization is considering appropriate recruitment indices. Therefore this study is about to identify competency factors of technical and professional colleges' faculty members to achieve the educational objectives and to present a basis which guarantees and promotes educational quality. Over 100 factors were identified which after screening by exploratory factor analysis the values gained in tree levels of competencies including entrance, general, and professional competencies were respectively as follows: 8, 30 and 18. these identifies factors all together determine a variance of 56.57% and they can be applied as an effective basis for recruiting competent and qualified faculty members for technical and professional colleges and also they can

provide a criteria for promotion, development and improvement of faculty members' present competencies.

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