
Validation Scale for Measuring Managers' Productivity in Islamic Azad University

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Abstract

The purpose of the present study is to validate a scale for measuring the productivity of the managers of higher educational institutes. The population of the study includes all the managers who work in all branches of Islamic Azad University in Iran (i.e., 420 branches and educational centers. The research sample consisted of 474 managers who were randomly selected from 79 branches using stratified and cluster random sampling methods). In this research, for each manager, three staffs under his supervision were selected and the questionnaire of productivity was administered to them. In fact, the sample of staff group consisted of 1422 subjects. The research instrument was the researcher-made questionnaire for productivity which consisted of 8 scales and the obtained Cronbach's Alpha value was 0.98. The results of factor analysis and principal components analysis, using a varimax rotation, showed that building blocks of productivity includes effective use of the factors of production (Items 35, 36, 39, 40, 41, 50, 54, 55, 56, 57 and 58), the people's attitude toward productivity (Items 11, 13, 19, 24 and 51), human relations (Items 1, 2, 4, 9, 14, 15, 17, 26, 29, 38, 46, 49 and 52), policies and procedures (Items 3, 6, 23, 32 and 33), the system of evaluation (Items 5, 21, 22 and 43), tools, equipment and planning (Items 18, 27, 28 and 38), organizing (Items 8, 10, 20, 31, 44, 45 and 48) and the direction of human resources and control (Items 7, 12, 16, 25, 30, 34, 42, 47 and 53).

Keywords: productivity, varimax rotation, Islamic Azad University

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Introduction and Purpose of the Study

Higher education system is one of the most important and complicated products of human achievements. In recent decades, the changes have revolutionized the social systems and organizations, hence scientific centers, in general, and universities in particular are more addressed to satisfy new expectations. Regarding the key role of higher education, Green (1997) explains that higher education provides the technical knowledge and skill that industry requires it in future and the fact that governments depend on this knowledge to have an effective and strategic programming. In addition, higher education develops the people's attitudes and motivation in order to confidently work in a group and actively participate in the national development plans. Universities are included in those social systems which have been recognized as the society's engine of raising awareness and the basic center of thought and reflection. Nowadays, no developed country is found that has reached its present status without relying on its active and equipped universities. Today, universities can be considered as the heart of the dominating and successful civilizations.

Godet (1994) in his book entitled "From Prediction to Action" refers to ten factors relating to universities' functions and indicates the important role of the leaders who direct these informing centers (i.e., universities). According to Godet, these factors are as follows: 1) university as a social organization should become ready to logically analyze the present situation of the society and set goal for the future purposeful movement of the country. 2) University should be the pioneer of spreading liberal thoughts and national solidarity. 3) It should help in analyzing and solving the problems the society faces. 4) University has an important role in explaining the way through which the things become globalized; hence, the familiarity with this process is the university's responsibility. 5) Universities will miss their unique role of knowledge development; therefore, they have to connect to other non-academic institutes and parallel institutes which are active in developing knowledge. 6) Universities are obliged to develop knowledge through applying basic research. 7) Universities are in charge of publishing and spreading the written culture. 8) Universities are committed to continually publish the culture of theism, kindness, brotherhood, social discipline, work

conscience, social sensitivity and commitment, and meritocracy. 9) As the source of thought and the place for bringing up the national resources, universities are responsible for leading and educating all members of the society. 10) As dynamic organizations and systems, universities have an important role in leading people to participate in running the society by providing the managers with their unique strategies and solutions.

Because of profound changes which have affected our today's world, the universities, even more than ever, have been in the focus of prolonged international and social discussions which devote to the goals and ideals of universities as well as their roles in guidance and leadership (Feigenbaum, 1994). The most important issue in each system, especially in higher education system, is the selection and appointment of the managers and leaders in a way that they can effectively administer the higher education institutes. Hersey and Blanchard (1988) believe that the role of the manager or leader of an organization is significant because he confronts all environmental variables which are around him. Managers should enjoy eminent characteristics and utilize studies and research findings related to management in order to apply suitable methods regarding the organization situation. Drucker (1954) believes that the managers are the most valuable resources of the organizations. The qualified and knowledgeable managers are able to achieve the organization's goal using their own abilities, specialized knowledge and vocational experiences while they apply less resource and increase the efficiency of the organization. One of the qualifications that the university managers should possess is high productivity.

The word "productivity" was posed by Quesnay for the first time in 1776 (Sumanth, 1998). In 1776, Adam Smith mentioned his ideas about work productivity, assigning of work tasks and specialty for profit rise, reducing tiredness, growing use of technology (Nayudamma, 1980). Regarding the concept of productivity, Smith refers to efficiency and specialty and believes that work should be assigned based on the people's efficiency and productivity. Economists like Sinver defined productivity based on the worker's physical, mental, rational and intelligent quality as well as his physical and mental power and skill. But the revolution in productivity has been done by Taylor from 1881 which can be considered as the history of formal and scientific studies about the productivity

management (Taylor, 1947). In 19th century, Litter defined productivity as the power of production (Sumanth, 1998). Mahoney (1988) believes that productivity includes efficiency, effectiveness, and change. In addition, scientists like Mescon et al. (1986), Boone and Kurtz (1991), Monga (1997), Robbins (1991), Ranftl (1989), Koontz et al. (1986), Stoner and Freeman (1992), Schermerhorn (1989), and Landel (1986) believe that productivity includes efficiency and effectiveness of performance, and increase in the productivity level in an organization is the result of the efficiency of management which equals good management.

The main goal of management is to increase productivity and keep its growth. In fact, the basis of productivity management is to create a suitable condition for higher level of performance. The process of productivity management indicates the existence of change, and change does not occur easily. You cannot order for some change. In the process of change, you should provide organization with necessary background. You should also identify the obstacles which confront the change, and do the necessary things to overcome them. Finally, you should fully identify what you are looking for, and vigorously supervise and handle the change continually (Belcher, 1987).

Wright (1989) summarizes the obstacles which exist in the route of reaching productivity as follows: lack of direction, weak organizational structures, the systems of payment and management. In other words, the management of productivity is the programming process, coordinating and monitoring the productivity program in the organization. A productive manager is a person who takes responsibility for doing important tasks (Lam & Ngee, 1987). Kopelman (1986) considers environment, the features of the organization, work characteristics, and individual characteristics as the four main factors which affect productivity.

Ross (1977) also believes that the productivity of an organization depends on resources, and management duties. He also states that making the staff to apply their abilities and capabilities leads to a higher level of organizational productivity and in turn to job satisfaction. Managing human resources and management performances related to job designing, job enrichment and flourishing, job circulation and shifting affect the staff's level of productivity. French (1986) believes that the success and

survival of organizations depend on the managers' attention to the internal (organizational) and external environments and outcome (results). These factors affect each other. For instance, when the organization management strengthens and supports educational programs (an internal factor), it affects the legal disciplines of employment (an external factor). As another example, the effectiveness of the organization (outcome) affects the quality and reasonable price of its products, and increases the demand for that product (an external factor). "The International Organization of Work" has divided the factors which affect the organization productivity into two main groups:

A. External factors (uncontrollable): Those factors which affect the organization from outside and they are not under the control of people or managers of that organization. In order to improve the performance of the organization, the external factors affecting the organization management and efficiency should be pinpointed and the organization should adapt itself to the changes of these external changes. These factors include financial rules and regulations, international politics, tax rules and statements, political, economical and social relations and factors.

B. Internal factors (controllable): These factors are under the control of people and managers of the organization. They can be used to promote the productivity of the organization if the contemplative managers apply them correctly (Prokopenko, 1992).

In his investigations, Sumanth (1998) has found seventy different ways by which managers can promote the productivity of organization. These ways have been classified as five main groups based on technology, human resources, product, work (process), and material. This classification includes all ways based on the engineering of traditional industry, market (buying and selling), controlling systems, research on operation, computer engineering, management, psychology, behavioral sciences, and so on.

In studies carried out by Chenari (2004), Karimvand (2004) and Zamani (2004) they measured productivity administering a questionnaire with seven underlying constructs of ability, clarity, help, incentive, evaluation, validity, and environment.

World Labor Organization has classified the factors affecting work force productivity. These three categories are general factors,

organizational factors, and human factors. Human factors include Labors' relationship with managers and foremen, social conditions, encouraging payments, the relationship between physical labor and work difficulty, work force features regarding their age, gender, skills and training, procedures, and job satisfaction. Recent studies cast light on the fact that the essence of upgrading productivity is human being. To upgrade productivity, according to Clements (2006), we should use the factors such as networking and collaboration, investing in people and skills, encouraging innovation and the use of technology, creating productive work place cultures, and measuring what matters.

Davis and Newstrom (1985) listed such factors affecting productivity as leadership management, mutual reliance between employer and employee, establishing a two-way organizational relationships, paying fair benefit, employee's participation in dealing with organization's affairs, and the chance for promotion.

According to Japan's Productivity Organization (1992), the factors influencing productivity are nine: detailed job description, flexible missions, group working, possibility for innovation, information distribution, sense of responsibility, using 5S, employee's commitment to work ethics, mutual reliance, and a long-term viewpoint (Robins, 1995). This organization views productivity as scientifically maximizing the use of resources, human force, facilities, etc., cutting the production costs, developing market, making new job opportunities, trying to increase real salaries, and improving life indices in with an eye to employees, management, and all customers (Sumanth, 1998). The results of a study carried out on American and Japanese managers to identify effective factors for high productivity indicated that, according to these managers, planning, motivation, communicating, leadership, efficient use of resources, and decision making were among those increasing productivity. There were, however, certain differences between managers in these two countries regarding the aspects of productivity. Japanese managers confirmed other-oriented and principle-oriented behaviors including strategic and innovative viewpoints, employee selection, and performance monitoring. American managers tend to emphasize other factors like: instrumental notions and individual supervisory skills including communication, working with people, knowledge of product,

belief in his/her ability to succeed, and decision-making technique (Bolda, 1990).

Three measurable features of work place regarding productivity are satisfaction that employee report, productivity those employees exhibit, and retention of employees (Measuring productivity, 2002).

The factors managers should take into account to upgrade the productivity in organizations, as Zarei (1998) pointed out, are control over achieving goals, assessment based on objective criteria of performance, observing human relations, encouraging positive attitude among employees.

In his study to measure the productivity of managers, Barzabady Farahani (2004) has administered a questionnaire according to the World Labor Organization's classification in which such factors as product, machinery, technology, materials and energy, people, organization and systems, working methods, and methods of management are considered.

The principles that help managers to improve productivity are:

1. Provide controls to monitor quality and productivity issues.
2. Provide a human focal point for coordination of technology projects
3. Provide adequate communication channels for improvement project activities
4. Keep an adequate focus on cost avoidance
5. Implement project monitoring strategies
6. Facilitate cooperation among participants.

Guidelines for implementing a new productivity and quality improvement idea include: 1) set realistic implementation goals, 2) obtain the support of the entire organization, 3) maintain internal and external contacts with those who have the expertise to help (Edosomwan, 1987).

Measuring factors of productivity improvement, Armistead (1991) named factors such as administration, staff, equipment, material, facilities, standards, and procedures.

The findings of the Sibson (1994) showed that the process of maximizing staff's productivity includes these factors:

- 1) get executive commitment
- 2) develop a productivity culture
- 3) make productivity part of every manager's job
- 4) measure productivity

- 5) utilize technology
- 6) remove unproductive practices
- 7) empower employees
- 8) utilize networking
- 9) ensure excellence in staffing
- 10) restructure the operation
- 11) manage performance
- 12) reward performance (Levin, 1994).

In a study conducted by Preziosi between the 1986 and 1998, the qualities of managers to manage productivity were listed as: capacity planner, resource planner, situational leader, task analyzer, waste reducers, and work place evaluator.

In a meta-analysis conducted in Hughes Aircraft Company on the research projects studying productivity in an eight-year period, Ranftel (1986) concluded that the following factors are seriously counter-productive:

1. Ineffective planning, direction, and control
2. Insufficient management attention to productivity and to the identification and elimination of counterproductive factors within the organization
3. poor internal communication
4. lack of effective performance appraisal and feedback
5. insufficient attention to low producers
6. ineffective subcont
7. Inadequate investment in, and lack of proper maintenance of, capital facilities

The purpose of the present study is to validate a scale for measuring the productivity of the managers of higher education institutes.

Research Questions

- (i) What are the indexes which construct the productivity of higher education managers'?
- (ii) Which of these indexes has more contribution in forming productivity of higher education managers'?

Method

The population of the study includes all the managers who work in all branches of Islamic Azad University in Iran (i.e., 420 branches and educational centers. In order to estimate the least volume of sample, $n = \frac{z^2 \sigma^2}{d^2}$ formula was used: $n = \frac{(38.66 \times 1.96)^2}{3.48} = 474$. The research sample consisted of 474 managers who were randomly selected from 79 branches and educational centers using stratified and cluster random sampling methods.) The stages of sampling were as follows: among the 12 academic zones, 79 University Branches and Education Centers were randomly selected; then, based on the number of managers in each branch or center, a certain proportion of managers were selected. In this research, for each manager, three staffs under his supervision were selected and the questionnaire of productivity was administered to them. In fact, the sample of staff group consisted of 1422 subjects.

Investigating the detailed research background of productivity concept from different points of views, in order to assess the productivity, at first a questionnaire including 65 items was designed. In the first stage, when the introductory questionnaire was designed and edited, in order to do the first investigation about the designed questionnaire it was given to a group of experts to get their feedback about the content of the items designed for measuring productivity. On the whole seven items were omitted from the body of the questionnaire. In addition, the content of some items was edited. In the next stage, after extracting the experts' feedback and modifying some items, the resulted questionnaire with 58 items was administered to 34 staffs. Using Cronbach's Alpha method to estimate the internal consistency of the items, the statistical results showed that the coefficient of the internal consistency of items was 0.98 which is at the level of excellent. The questionnaire consists of 9 factors or characteristics. Which are effective use of the factors of production (Items 35, 36, 39, 40, 41, 50, 54, 55, 56, 57 and 58), the people's attitude toward productivity (Items 11, 13, 19, 24 and 51), human relations (Items 1, 2, 4, 9, 14, 15, 17, 26, 29, 38, 46, 49 and 52), policies and procedures (Items 3, 6, 23, 32 and 33), the system of evaluation (Items 5, 21, 22 and 43), tools, and equipment (Items 18, 27, 28 and 38), planning (Items 18, and 37), organizing (Items 8, 10, 20, 31, 44, 45 and

48), and the direction of human resources and control (Items 7, 12, 16, 25, 30, 34, 42, 47 and 53).

The researcher has used extracted factors through Varimax Rotation and Linear Structure Relationships Software (LISREL) in order to obtain and to entitle simple construction of productivity factors.

Findings

In the present research, 383 subjects were male, and 91 subjects were female. Regarding the academic degree, 60 subjects held Diploma or Associate Diploma, 244 subjects held Bachelor's degree, and 170 subjects held Master's or Ph.D. degrees. Regarding the marital status of the subjects, 44 people were single and 422 people were married. Regarding the subjects' work experience, 92 people had less than 5 years, 171 people had between 6 to 10 years, and 204 people had more than 11 years of work experience.

The first step in factor analysis process which is also its first assumption is Checking Missing Data. In this step subjects number 418, 461, 567, 589, 590, 601, 607, 634, 649, 655, 657, 660, 816, 939, 1064, 1138, 1232, 1288 and 1316 including nineteen persons altogether were eliminated from statistical analysis so that the factor analysis assumption under the heading of at least missing (0.02) could be observed in each subject. Hence, in this research no item has been eliminated except three subjects. And the given situation shows that there is no need to omit some of the items and it is possible to follow the process of Factor Analysis while having all the items. The second factor analysis assumption denotes enough sample size. In this research, Kaiser- Meyer- Olkin (KMO) equals 0.98; consequently, the sample size is sufficient. The third factor analysis assumption is normality of multi-variation distribution known as sphericity. As the Approximate Chi Square equaled 40171.525 with the 1653 degrees of freedom, it can be stated that the amount of the Approximate Chi Square is statistically significant and the given statistics is significant at least at the 0.999 level of confidence ($\alpha = 0.001$).

According to component matrix of items we can determine both the specific factor of each item and its position in the related factor based on loading factor. After studying table of component matrix precisely, the researcher used Rotation Method so that loading factor of each item can

be determined stressing at recognition of each item in one of the 9 factors. Reiterating that in this research, the researcher has followed Exploratory Factor Analysis and has used Principal Component Methods from Extraction of Factors, varimax Method was applied (table 1). According to varimax, the researcher was able to determine both the factor to which the item belongs after rotation and the position of each item in related factor with reference to loading factor. This table shows in which factor each item has been located after the rotation. For instance, Items 1, 2, 4, 9, 14, 15, 17, 26, 29, 38, 46, 49 and 52 have been located in the third factor.

Eventually, 8 factors have been extracted from rotation of factor analysis; in fact, productivity of managers consists of 8 factors respectively as follows: effective use of the factors of production, the people's attitude toward productivity, human relations, policies and procedures, the system of evaluation, tools, equipment and planning, organizing, and the direction of human resources and control.

Table 1
Rotated Component Matrix

	Component							
	1	2	3	4	5	6	7	8
q1			.555					
q2			.548					
q3				.358				
q4			.596					
q5					.577			
q6				.683				
q7								.583
q8							.711	
q9			.557					
q10							.580	
q11		.456						
q12								.578
q13		.419						
q14			.513					
q15			.512					
q16								.558
q17			.677					
q18						.556		
q19		.489						
q20							.608	

q21	.656	
q22	.691	
q23	.403	
q24	.454	
q25		.747
q26	.501	
q27		.742
q28		.758
q29	.554	
q30		.703
q31		.740
q32	.447	
q33	.419	
q34		.465
q35	.572	
q36	.746	
q37	.557	
q38		.486
q39	.489	
q40	.533	
q41	.533	
q42		.654
q43	.790	
q44		.554
q45		.787
q46	.460	
q47		.763
q48		.692
q49	.600	
q50	.412	
q51	.583	
q52	.605	
q53		.780
q54	.494	
q55	.744	
q56	.750	
q57	.705	
q58	.561	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 11 iterations.

Hence, emphasizing at the eight-fold factors of productivity, items related to each factor have been summarized in Table 2 respectively.

Table 2

Results of Factor Analysis of Productivity of Managers Construct

Factors	Index	Items
1 st	Effective use of the factors of production	35, 36, 39, 40, 41, 50, 54, 55, 56, 57, 58
2 nd	The people's attitude toward productivity	11, 13, 19, 24, 51
3 rd	Human relations	1, 2, 4, 9, 14, 15, 17, 26, 29, 38, 46, 49, 52
4 th	Policies and procedures	3, 6, 23, 32, 33
5 th	The system of evaluation	5, 21, 22, 43
6 th	Tools, equipment and planning	18, 27, 28, 38
7 th	Organizing	8, 10, 20, 31, 44, 45, 48
8 th	The direction of human resources and control	7, 12, 16, 25, 30, 34, 42, 47, 53

Discussion and Conclusions

In this study, in order to assess the managers' productivity, the productivity questionnaire was applied which contains 8 scales of effective use of the factors of production, the people's attitude toward productivity, human relations, policies and procedures, the system of evaluation, tools, equipment and planning, organizing, and the direction of human resources and control. The 8 factors which were used to assess the productivity in this study are in agreement with the theories and studies carried out in and out of Iran. Some of the similar studies done in the same field are as follows: Clements (2006), Karimvand (2004), Zamani (2004), Sumanth (1998), Preziosi (1998), Prokopenko (1992), Armistead (1991), Davis and Newstrom (1985), and French (1986).

Higher education system is the one in every society whose main role is to develop and present science to the society. It is considered a basic system which affects the other systems such as production, technical, economic, social and administrative systems. Therefore, it can be stated

that the dynamism of the systems of every society, to a great extent, depends on the dynamism of the higher education system. At the present time, the degree of contribution of higher education in economic development has been widely identified both in the economies which rely on advanced technology and those of newly industrialized or developing countries. Higher education is also considered as the most important organization which focuses on "thoughts" and has a profound effect on culture, political and religious affairs.

The very important issue in each system, especially in the system of higher education, is to select and appoint qualified managers and leaders in a way that they can effectively administer the higher education institutes. Because of the technological development in the field of information, higher education institutes are considered as one of the members of information society; therefore, they need to have skills and appropriate capabilities in order to transfer, share and apply knowledge (Hejazi & Veisi, 2007). One of the required qualifications of the university managers is high productivity. Productivity and efficient leadership have a strong relationship and are included among the variables whose efficiency have been investigated and proved by the following researchers: (Sumanth, 1998), Mahoney (1988), Mescon et al. (1986), Boone and Kurtz (1991), Monga (1997), Robbins (1991), Ranftl (1989), Koontz et al. (1986), Stoner and Freeman (1992), Schermerhorn (1989), and Landel (1986). Regular measurement and thus evaluation of productivity would lead to a qualified use of the facilities and inhibit the unbalanced increase of costs. This also upgrades the quality and quantity of the goods and the productive services. (Alvani, 1996)

The need for management and leadership is vital and sensible in all fields of social activities. Without effective leadership and guidance, material and human resources are doomed to decrease and destruction, while the managers of higher education as people who are in charge of organizations and university branches are considered as the main and determining factor in preparing and supplying the human resources required by other organizations which provide services or products in the society. The related background information shows that if universities have managers who enjoy a high degree of productivity, the universities will be able to achieve their goals while they spend fewer sources but

with better quality. They can also increase the level of productivity of the higher education system, and undoubtedly the society will enjoy higher productivity.

Regarding the research background and the related theories, the eight factors involved in productivity show that the productivity scale almost generally covers the factors which make it. Hence, it can be concluded that the results obtained from the administration of the tool and the level of managers' productivity determined by the application of the tool as well as its validity are generally acceptable. The increasing need of organizations for determining the managers' attitude toward the work environment from the one side and the lack of valid definitions about productivity and the existence of this feature in the managers of higher education from the other side were the main causes of doing the present study. In addition, the research was done to identify the precise and complete dimensions, aspects and factors which make productivity through measuring the validity of the productivity scale which was designed and administered to the managers of higher education. In this way, it is possible to locate the theoretical position of productivity and identify the importance of the variables which have been introduced by different theories as the factors which form productivity. The ultimate purpose of the study, then, is to design and administer a valid tool which can determine the extent of productivity of managers in higher education.

Implications and Recommendations

The results of the present paper recommend that afore-said questionnaire be used in the coming researches of productivity analysis specifically for high-rank officials of Islamic Azad University. The reasons behind it is: the great number of studies carried out in relation to the existence of relationship between productivity and efficient leadership; the fact that universities are included in the social systems which have been recognized as the engine of spreading knowledge and awareness as well as the center of directing the societies, and the productivity questionnaire, as the results of this study suggest, enjoys some psychoanalytic features specifically construct validity. Furthermore, regarding the role of universities as the basic center of thought and reflection, the study is better to be carried out in all other universities and

its findings, in turn, be taken into consideration whenever the managers are supposed to be appointed. In that case, the management with high productivity and appropriate trainings which strengthen the factors of productivity provide a better context in which the universities and higher education systems in the whole world achieve their goals.

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