MODELING PRODUCTIVITY IN THE PUBLIC SECTOR OF EDUCATIONAL ADMINISTRATION

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ABSTRACT
The research purpose is to construct a structural model to assess the employees’ productivity in the public sector of educational administration of Iran based on intellectual capital. The population comprised all the employees of the public sector of educational administration, out of which a sample of 382 employees’ was randomly drawn. The research tools consisted of a researcher-made questionnaire on employees’ productivity, this 47-item questionnaire was designed based on the theory of (Hersey and Goldsmith,1980) and assesses the underlying factors of ability, clarity, help, incentive, evaluation, validity and environment ($\alpha = 0.93$), the second questionnaire named (Bontis’s,1997) intellectual capital questionnaire which consisted of 50 items with three underlying constructs of human capital, customer capital, and structural capital with Cronbach Alpha of 0.87. The results of path analysis using LISREL software indicated that dimensions of intellectual capital had a direct effect on productivity with the indices of 0.73. The model also showed that the factor of human capital in intellectual capital had the highest direct effect on productivity. It was also concluded that the proposed model showed full fit.

Keywords: Productivity, Intellectual Capital, Public Sector of Educational Administration

INTRODUCTION
In the era of increasing competition and limited resources, enhancing employees’ productivity in the organization is a critical issue for administrators (Bain, 1982). The word “productivity” was first posed by Quesnay in 1776 (Sumanth, 1998). Adam Smith introduced his ideas of work productivity, carrying out the assigned tasks and proficiency for profit rise, reducing tiredness, taking advantage of technology (Nayudamma, 1980).

The revolution in productivity has been staged by Taylor in 1881 which can be considered as the history of formal and scientific studies on the productivity management (Taylor, 1947). In the 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., 1988; Boone and Kurtz, 1991; Monga, 1997; Robbins, 1991; Ranftl, 1989; Koontz et al., 1986, Stoner and Freeman, 1992; Schermerhorn, 1989; Landel, 1986) believe that productivity includes efficiency and effectiveness of performance.

According to (Bell-Roundtree, 2004) productivity can be defined as bringing about desired and optimal results or high levels of performance. Hersey and Goldsmith isolated seven variables related to effective performance:

- Ability (Knowledge and Skills): Ability refers to the follower’s knowledge, experience, and skill;
- Clarity (Understanding or Role Perception): Clarity refers to an understanding and acceptance of what to do, when to do, and how to do it;
- Help (Organizational Support): Help refers to the organizational help, or support, that the follower needs to effectively complete the task;
- Incentive (Motivation or Willingness): Incentive refers to the follower’s task-relevant incentive;
- Evaluation (Coaching and Performance Feedback): Evaluation refers to informal day-to-day performance feedback as well as formal periodic reviews;
- Validity (Valid and Legal Personnel Practices): Validity refers to appropriateness and legality of human resources decisions made by the manager;
Environment (Environmental Fit): Environment refers to the external factors that can influence performance even if the individual has all the ability, clarity, help, and incentive needed to do the job (Hersey, 2001).

While withstanding a highly competitive environment, an increasing number of firms have recognized that intangible assets rather than tangible ones are vital to achieving competitive advantages. Intellectual capital has replaced physical capital as the primary basis of value creation. The importance of intellectual capital in ensuring superior competitive advantages is well-accepted (Wu, 2006).

The growing importance of intellectual capital has its foundations in several studies carried out since the 70s, which focused on so-called invisible assets. The concept of “intellectual capital” was advanced by Adam Mueller, Friedrich List (1961) and referred to technical knowledge, know-how skills, and forms of organization and tangible capital goods. It is the result of the investment in advancing and sharing the productive knowledge. Among the studies on the intellectual capital, the works of (Itami and Roehl, 1991) can be highlighted although the concept has gained a position of prominence only after the works of (Sveiby, 1997) in Sweden.

Intellectual capital provides the concept of knowledge management that helps managers to identify and to classify the knowledge components of an organization. Intellectual capital concepts have given rise to a substantial number of interesting studies, some of which were published in the journal of Fortunain 1991 (Stewart, 1991). Intellectual capital, such as knowledge, skill, and relationship is more than ever, the vital strategic and competitive resource. Academics believe that all economic participants like employees, managers, investors, governments gain the benefits by accepting the intellectual capital as a resource and by measuring its efficiency (Pulic, 2004). In a knowledge-based economy, companies do not only produce products or services but create added value to survive in the reality of the new economic. Academics also believe that intellectual capital is the lever for maintaining competitive advantages and sustainable performance. Accordingly, identifying, valuing and managing intellectual capital is becoming increasingly important for companies (Edvinsson and Sullivan, 1996; Prusak, 1998; Ross and Ross, 1997; and Stewart, 1995). In Fortune, Steward (1991) defines intellectual capital as “knowledge that transfers raw materials and makes them more valuable”.

The concepts of intellectual capital seem to have been classified into three different groups (Edvinsson and Sullivan, 1996; Ross and Ross, 1997; Steward, 1995).

Human Capital: Human capital simply comprises the competence, skills, experience, and intellectual abilities of the individual employees (Bounfour, 2003; Brooking, 1996; Edvinsson and Malone, 1997; and Ross et al., 1997).

Structural Capital: Structural capital includes processes, systems, structures, brands, intellectual property, and other intangibles that are owned by the firm but do not appear on its balance sheet (Bounfour, 2003; Brooking, 1996; Edvinsson and Malone, 1997; Ross et al., 1997).

Customer (Social) Capital: Customer capital is an intermediary form of intellectual capital consisting of knowledge in groups and networks of knowledge resources embedded within and derived from a network of relationships (Edvinsson and Malone, 1997; Ross et al., 1997).

Intellectual capital is an instruments to face the new challenge (Ramirez, 2010), and also indicator of corporate value (Khan, 2011); it’s also a factor in the success of new ventures (Hormiga et al., 2011). (Herremans et al., 2011) found that if managers properly structure their organizational control system to help develop intellectual capital capabilities, these systems can lead to reduce internal uncertainty regarding human, structural, and relational capital.

Intellectual capital has been described as intellectual material that has been formalized, captured and leveraged to produce a higher valued asset (Klein and Prusak, 1994). Intellectual capital is about how to let the knowledge of an organization work for it and have it create value (Roberts, 1999) and includes all intangible resources as well as their interconnections (Bontis et al., 1999). An interesting conceptualization sees intellectual capital as the combination of intangible resources and activities that allow an organization to transform a bundle of material, financial and human resources in a system.
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capable of creating stakeholder value (European Commission, 2006) and organizational innovation (Lerro et al., 2009). In particular, intellectual capital can be thought as the economic value of two categories of intangible assets of a company, i.e. organizational capital and human capital (OECD, 1999). Thus, intellectual capital includes a set of intangible elements (resources, capabilities and competences) that drive the organizational performance and value creation (Bontis et al., 2000; Roos and Roos, 1997), and this suggests causal relationships between intellectual capital and organizational value creation (Marr and Roos, 2005). Studies show that intellectual capital is significantly correlated to the factors such as performance (Cheng, 2010; Sharabati et al., 2010; Patricia, 2007 and Shu-Lien, 2007), financial performance, economic success (Maditinos et al., 2011; Zeghal and Maaloul, 2010; Carlucci, 2010), value creation (Diez et al., 2010; Schiuma et al., 2008), and entrepreneurial orientation (2002).

The research results indicate that upgrading the quality of human capital (as one of the integrations of the newly developed 3-leaf model of intellectual capital) is likely to positively affect the productivity growth (Afrooz et al., 2010; Huang and Jim, 2010; Sanromá and Ramos, 2007; Wu et al., 2006; Walker, 2001; Donna, 1996). The necessity of carrying out such a research was born out of the fact that Iranian schools (elementary schools, junior high schools and high schools) are under the direct supervision of the public sector of educational administration.

The research purpose is to construct a structural model to assess employees’ productivity in the public sector of educational administration of Iran based on the intellectual capital.

MATERIALS AND METHODS

Research Questions

1. What is the structural model of employees’ productivity based on the intellectual capital in the public sector of educational administration?

2. Which variable has the highest effectiveness on employees' productivity?

3. How predictive is intellectual capital on promoting employees' productivity?

4. How much is the goodness of fit in this study?

Method of the Study

The research methods which were used in this study are: library research to access the theoretical framework and the related literature; and the survey method to collect, classify, describe, and analyze the data.

The population under investigation in this study consists of official staff working in 20 administrative districts of the public sector of educational administration in Tehran city, by which the schools in Iran are under the direct supervision. In order to estimate the least volume of sample, a formula was used. Regarding the minimum sample required for the staff’s group which was estimated at 382 individuals, the same number of questionnaires of intellectual capital and employees' productivity were administered to the staff members, who were selected using simple random sampling.

The research instruments were as follows: A researcher-made questionnaire for employees’ productivity which was designed and developed based on the theory of Hersey and Goldsmiths’ (1980) with 47 items and underlying factors of ability, clarity, help, incentive, evaluation, validity and environment($\alpha = 0.93$), and (Bontis’s, 1997) intellectual capital questionnaire which consisted of 50 items with three underlying constructs of human capital, customer capital, and structural capital and Cronbach Alpha of 0.87. The results of the study were calculated through path analysis using LISREL software.
RESULTS AND DISCUSSION

The data collected from the administration of the instruments were analyzed. These data included the different indexes of central tendency, variability and the distribution of staff’s groups, the staff members’ scores obtained from intellectual capital and employees’ productivity questionnaires and their related components. The distribution of the staff members’ scores in the given variables had tendency toward normality.

Figure 1: Path analysis model for components of intellectual capital and employees’ productivity

As shown in Figure 1, the Lambda rate of external latent variable of intellectual capital components was 0.85 for human capital, 0.77 for structural capital, and 0.84 for customer capital, it’s worth mentioning that their accumulation form the intellectual capital variable with the effectiveness rate of 0.73. It means that 73% of the variation in the dependent variable of employees' productivity is explained by a collection of these indices. The variable of human capital indicates the highest amount of internal consistency in the external latent variable.

The Lambda rate of internal latent variable of employees’ productivity components was 0.74 for help, 0.84 for incentive, 0.77 for evaluation, 0.86 for validity, 0.61 for environment, 0.43 for ability and 0.26 for clarity. Their accumulation form the employees’ productivity variable. The validity of variable indicates the highest amount of internal consistency in the internal latent variable.

Since the model’s goodness of fit index is 0.93, it can be stated that it has an acceptable fit. The calculated index indicates the direct effect of intellectual capital components on employees’ productivity. Moreover, the model shows that the highest direct effect is related to human capital.

The following table presents the indices related to the model’s fit:

<table>
<thead>
<tr>
<th>Index</th>
<th>Rate</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewis-Tucker (Non-normed fit index)</td>
<td>0.92</td>
<td>High fit (more than 0.90)</td>
</tr>
<tr>
<td>Bentler-Bonett’s (Normed fit index)</td>
<td>0.91</td>
<td>High fit (more than 0.90)</td>
</tr>
<tr>
<td>Hoelter</td>
<td>0.72</td>
<td>High fit (more than 0.70)</td>
</tr>
<tr>
<td>Root Mean Square Error (RMSE)</td>
<td>0.05</td>
<td>High fit (equal to or less than 0.05)</td>
</tr>
<tr>
<td>GFI</td>
<td>0.93</td>
<td>High fit (more than 0.90)</td>
</tr>
</tbody>
</table>
The five goodness of fit indices presented model’s fit and empirical data. Therefore, desirability adaptation is provided for the designed model and empirical data and can approve it as an appropriate model for the employees’ productivity.

**Conclusion**

The results of path analysis method revealed that dimensions of intellectual capital have positive impact on employees’ productivity. The findings of the present study, furthermore, indicated the influential role of intellectual capital on employees’ productivity. The results of this study are in line with the research by Huang and Jim (Wu, 2010; Hall, 2003; Agor, 1997). They have also found the significant relationship between intellectual capital and its strategies with the productivity. Hall (2003), has advanced and put forward a theoretical model in his research, documenting the effect of the intellectual capital upon the enhancement of the nurses’ productivity. Huang and Wu (2010) found that, all dimensions of intellectual capital positively and significantly influence knowledge productivity. The results also reveal that increase in human capital investment produces significant and positive effect on productivity (Afrooz et al., 2010; Huang and Jim, 2010; Sanromá and Ramos, 2007; Wu et al., 2006; Walker, 2001; Donna, 1996). Several studies suggest proofs regarding the point that the intellectual capital has positive impact on market value, productivity, return on assets and sales growth (Pulic, 2000; Sofian et al., 2002; Chen, 2005; Firer and Williams, 2003; Kremp and Mairesse, 2004; Diez et al., 2010; Laing et al., 2010).

In an era of increasing competition and scarce resources, maximizing employees’ productivity to the organization is a critical issue for administrators (Bain, 1982; Kouzes and Posner, 1988; Nanus, 1989; Ouchi, 1981; Peters, 1992). We are on the verge of an exciting time. Although financial resources available to the public and non-profit sectors is likely to remain flat or even decline in the immediate future, within our grasp, we have new capabilities that can help us use these resources more effectively and efficiently. The use and development of intellectual capital (knowledge assets, management processes) offers us both a short-term and long-term resource that can be tapped for enhanced productivity. It will be the leadership challenge of this next century to learn how to do so (1997).

One of the most promising recent developments in the management field is the effort to measure, use and develop what has been termed an organization’s most valuable asset - intellectual capital. For public non-profit organizations, this effort has special potential for increased productivity. This is true for several reasons. These sectors are human capital intensive. Human capital is the primary source for organizational innovation and renewal (1997).

Intellectual capital is a firm's source of competitive advantage, to become knowledge driven, companies must learn how to recognize changes in intellectual capital in the worth of their business and ultimately in their balance sheets. A firm's intellectual capital – employees' knowledge, brain power, know- how, and process, as well as their ability to continuously improve those process-is a source of competitive advantage (Vargas-Hernández et al., 2010). Successful organizations hire intelligent staff and this is the usual form of developing intellectual capital in the organization (Sveiby, 1997; Ross et al., 1997; Stewart, 1995; Edvinsson and Sullivan, 1996; Edvinsson and Malone, 1997). Intellectual capital can foster organizational competitiveness (Vargas-Hernández and Noruzi, 2010).

The results of the present research with regard to the effect of the intellectual capital upon the productivity, is meant to suggest that for productivity growth, long-range plans are bound to be devised and developed in the Educational Bureaus regarding the efficient management strategies, in order to minimize the expenditure and the pursuit of cost reduction, growth of the average per capita income, promotion of innovative and novel ideas, facilitation of constant innovation, elimination of unnecessary and excessive bureaucracy, and creation of a favorable organizational climate. Moreover, through offering, guaranteeing and expanding the most efficient and quality services to schools (elementary schools, junior high schools and high schools) located in Tehran and also identifying and fulfilling their needs, their satisfaction can be fulfilled and their loyalty can be engendered. Furthermore, considering the fact that human capital exerted the most principal effect on the productivity, it can be suggested that in the public sector of educational administration.

The staff members acquire the greatest level of competence.

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The close cooperation is encouraged. Their knowledge and information is updated through occupational and in-service training. Organizations carry out successful staff and executive recruitment. Try to maximize the organization-related success through practice. In conclusion, the newly-proposed results in this research can be effectively employed to enhance the productivity in similar organizations.

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