

*The study of effective factors on the optimum use of educational space and the presentation of applied model in technical and vocational factories*

**Ahmad Sarani**  
**Abbas ali noura**  
**Zahra Nejad akbari**

***1. Abstract***

With regard to the important improvable application of space specially educational Factorial one and with regard to the fact that there has never been such a research this province and also because determine a model for improving factorial space, the above research has been conducted factories of organization of technical and vocational education in golestan province in 2006.

This research is of a descriptive kind that was used improving space taking advantage of the linear programming model and for getting target function coefficients and limitations have been used from exact observations and distributed questionnaire among 118 persons of managers, educators and experts of the factories of the technical and vocational education and industrial organization of the province. The foundations of above research are mathematic model that has specified in four groups for similar factories. The acquired results of the acquired models showed that the designed models in this research causes improving of space.

***Keyword:*** *educational space, model, linear programming, optimum,*

**1. Introduction**

Most of organizations specially educational organizations comes across lack of space that most of times is in order to false use of space improving and suitable allocating of spaces are one of the important problems of programming in improvable use of the space of educational and productive centers too. It seems that today's, most of managers of this centers in order to speeding in doing affairs and job congestion prevention should research about location and space of doing activities [<sup>1</sup>].

Because the factories such as light, air conditioning, cold, heat, equipment setting, library, existence of internet be available and flexibility are effective in improvable use of space[<sup>2</sup>] that true use causes harsh decrease of expenses[<sup>3</sup>]. Many researches have ever done for improving space but in organization of technical and vocational education from golestan province hasn't done any research for improving space that in order to nonexistence of use of suitable methods improving space will come across this organization with decrease operation in factories. So, we easily conclude that imprison of learners always in boring space and inflexible such as class or factory can't guide this

organization to ward desired goals not in the view of education nor in the view of training [4].

The improvements that have done for space in organizations have ever been with directive different methods and the improvement of space has used less by use of mathematic models. The question is that what is the effect of every said factors on the improvable use and what model we can show for it? This research shows methods for increasing use coefficient from educational space in technical and vocational education factories in golestan province. This methods have gotten by use of linear programming model whit determining decision variables ( effective factories on improving space ) and target function for every factories and their limitations and allows to managers to pay for analysis sensevity and parametric programming[5]. The acquired model has solved and tested (examined) by software QSB.

## 2. Material and Method

The done researches are a kind of descriptive and for acquired target functions coefficients in linear programming have been used of collection of experts, managers and educators from technical and vocational centers from Golestan provinces (the turning factories of metals, welding with electricity, general plumbing, industrial plumbing, welding with gas and carpentry) that their number is 20 persons and also managers of industries and experts of headquarter and practical of industrial centers from Golestan province(managers 420 persons, experts of headquarters and practical trade union 600 persons)(statistics of 2005 industrial office from Golestan Province) as statistics society . So, grand total of persons from statistical society is planned 1024 persons.

### 2-1. Sampling Methods

In this research for selection sample persons has been used from coincidental sampling methods and statistical society has been classified on base of variable of a kind of job and or organizational position (employee, expert, managers and educator).

The use this method was caused that firstly, distribution of sample in all classes of society is suitable. Secondly, general properties and specialties of society was recognized. Thirdly, specialty and variable each class be take in to consideration.

On the base of approximate evaluation formula, the sample volume was choice of all industrial managers and experts totally 96 persons for damaged ratio plus 6 persons of managers and 16 persons of educator of metal turning factories, plumbing with electricity, general plumbing, industrial plumbing of technical and vocational centers from Golestan province was increased to sample persons, above that totally number of the sample persons has determined.

In this research for getting the final model for the purpose of each factory, firstly the planned questions at 4 groups have classified as follows:

The first group: the questions related to the equipment set in factory.

The second group: the question related to the use of cold, hot means and light.

The third group: the questions related to the existence of ware houses in factories.

For each factories, target function has modeled to the following form.

For getting target function coefficients (Ci) ware used from the questionnaire consists of 6 general questions and 53 special question that the special questions of this

questionnaire have been obtained from research questions and the responsive determined the effect of effective factors on increasing coefficient improvement from educational space in 5 alternatives very much, much, middle, little, very little, this factors consisted of metrage of factories, light, cold and hot equipments, existence of library and internet, existence of ware house. The equipment setting inside factories.

For determining numerical quantity each of target function coefficient has influenced for each answers.(very much 5,much 4,middle 3,little 2,very little 1)and average of acquired answers was regarded as each coefficients in target function. also, limitation with regard to standard and the exact observations.

The functions of research in the mentioned 4 groups have modeled as following method:

*The first group model:*

Purpose: increasing use of educational space by kind of set

$X_j$ : decision variable

$C_j$ : target function coefficient

$$\text{Max } z_1 = \sum_{j=1}^4 c_j x_j$$

The technique of programming true number has used

$J_1$  =production process

$J_2$  =kind of production or service

$J_3$  =fixed position

$J_4$  =cellular

*The second group model:*

Purpose: increasing improvement of the education of space by use of cold, hot means and luoynt.

$$\text{Max } z_2 = \sum_{j=5}^6 c_j x_j$$

$J_5$  =light

$J_6$  =cold , hot

s.to

$$20 \leq x_5 \leq 28$$

limitation of temperature

$$150 \leq x_6 \leq 30$$

limitation of light

*The third group model*

Purpose : increasing improvable use of library and internet .

$$\text{Max } z_3 = \sum_{j=7}^8 c_j x_j$$

$J_7$  =library

$J_8$  =internet

$$X_7 \geq X_8$$

$$X_7 + X_8 \leq 2$$

Usable programming technical of true number

***The forth group model:***

Purpose: increasing improvable use of ware houses the target function differs from limitations of this group because the ware house of under consideration factories has been grouped and factories that are different have placed in one group. The groups have considered as following:

The first group: general plumbing factories, industrial plumbing.

The second group: welding with gas factories, welding with electricity, turning.

The third group: a carpentry factory

The target function and general limitations of this group have modeled as following

$$\text{Max } Z = \sum_{j=1}^{10} c_j x_j$$

$$X_i = 1$$

The usable technique is programming true number

N=the number of ware houses different group.

**Discussion and Conclusion**

The above research has done with purpose of consideration of the effective factors on the improvable use of educational spaces in the organization of the technical and vocational and presentation applied and suitable model by use of linear programming .The acquired results for target function coefficient is according to table 1-1 if necessary can use that for other factory other than considered sample and limitation coefficients and quantities were collected by use of available standards and exact observations and by use of software WQSB obtained the acquired results of that models and this results showed that designed models are effective on improving spaces. This research is beginner for doing other researches in the educational and office of fields such as factory and no factory .It is suggested that researchers to pay a examination of the educational and vocational space by developing this models and to take action for their improving by use of linear programming models.

Table 1-1 quantities C<sub>j</sub> for different factories.

table-1-1

	general plumbing	industrial plumbing	metals	welding with gas	welding with electricity	carpentry
C <sub>1</sub>	4.6	4.25	4	4.21	2.6	4.3
C <sub>2</sub>	4	4	4.3	4.5	4.3	4.3
C <sub>3</sub>	3.8	4	4	4	2.6	4
C <sub>4</sub>	3.2	4	3.3	3	2.3	4
C <sub>5</sub>	4	3.75	4	5	4	5
C <sub>6</sub>	4	3.5	4.6	4.5	4	4.6
C <sub>7</sub>	4.2	3.75	4	4	3	3
C <sub>8</sub>	4.2	4.75	3.6	3.6	3.3	2.6
C <sub>9</sub>	3.25	3.75	1.5	3.75	3.8	4
C <sub>10</sub>	3.75	3.2	3.75	1.5	1.5	-

<sup>1</sup> -Vaziri, A. Industrial planning. 2nded .Iran: 2005.

<sup>2</sup> -Gharegazloo Z, Form and space . Iran: Tehran university co ;2001

<sup>3</sup> - Monks ,J. shamus's outline of theory and problems of operations management. new york: Mc Graw-Hill book co.1995

<sup>4</sup> -Hmadiyan, M. Educational Technology, Iran: Tehran boshri co.1993, pp. 147.

<sup>5</sup> -Render, B. Quantitative Analysis for Management,4th, usa: 1991