Fundamental Skill Levels of the Students in Vocational and Technical Education (Higher Education) Institutions

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Abstract: Education systems are questioning the required skillsto raise the new milleniums human model. Various levels of fundamental skills are getting place in living skills. But in our country it is a main problem whether the students in instututions that give graduate degree to become vocation teachers, have the quality.According to this problem, the aim of the research is to determine the Fundamental Skill levels of the students in Vocational and Technical Education (higher education) institutions. With this purpose, the junior-senior students of Gazi University Technical Education Faculty Electronic, Computer, Electrical, Otomotive, Structure, Commerce Tourism Education Faculty Pension and Vocational Education Faculty Clothing departmentsbecame the working universe of the 301 researches. This students are applied a 40 article scale of eight dimensions consisting of communication skills, problem solving, enterprising, being sociable, scientific thinking skills, disciplined, critical thinking, being strong minded. After the validity and security works, the developed Likert type scale resulted varience ratio was 48.391%, Cranbach alfa security value was 8442. The research findings have been constructed according to the Anova analysis and Scheffe tests which are performed for the comparisons between the sections of general skill level and eight dimension general skills. In the outcome of the research a new scale to determine the Fundamental skill level has been developed. We can say that Vocational and Technical Education Faculty Students's Fundamental Skill levels are on a middle point. It is not negative but it is not also positive. There is need to develop programmes to promote fundamental skills. New research can be made with more technical measuring devices.

Key words: Fundamental skill · core skills · vocational and technical education

INTRODUCTION

Advances witnessed in all domains require redefinition of the workforce's qualities. Traditional model of workforce also requires such a redefinition and new qualities [1]. Formal and informal education programs provided in the current educational institutions are not efficient in training people for their future life. In order to implement professional skills efficiently such key skill domains should be reformulated and be acquired by individuals through educational system.

These significant key skills domains have been described by the related studies in the form of the steps given below [2-5].

Communication skills: These skills include the individuals' efficient speaking, listening, reading and writing and achieving the correct conclusions, develoing and demonstrating them.

Numerical skills: These skills refer to comprehend the numbers, graphics-tables and mathematical procedures used in workplace and daily life.

Skills to use information technologies: These skills include the use of knowledge and communication technologies, accesing, gathering, reorganizing and presenting the knowledge.

Skills to cooperate: These skills refer to one's ability to integrate his/her potential into others' and to employ characteristics to reach a common certain objective.

Skills to self-learning and develop potential: These skills refer to one's develop oneself through his/her internal motivation to meet learning and development needs.

Problem-solving skills: These skills make someone to solve any problem using scientific methods.

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Scientific study skills: These skills refer to be aware of data collection methods and techniques and to enjoy using them and also to be neutral in terms of the results of the research.

Girisimcilik: It refers to have couragement to initiate any activity and to have higher levels of desire to implement innovations.

Verbal competency: People with verbal competency express their feelings and thoughts in a simple, understandable speech and proper speech pace.

Critical thinking: It refers to be open to new ideas and thoughts and to use them in daily life, to consider different approaches to problem-solving.

Creative thinking: It refers to be open to new ideas and thoughts, to comprehend, develop and make use of them.

These major domains of skills are valued and preferred by employers. However, such skills contribute to more efficient and productive work life. Furthermore, these skills are also helpful in solving the problems that may be faced in daliy life [6, 7].

Therefore, it is one of the most significant tasks of educational systems to provide the students with such skills in terms of both theory and practice [5].

Objectives: The objective of the study is to identify the levels of basic skills of the students attending to vocational and technical education faculties.

Sub objectives: The study attempts to find out the levels of basic skills and that of following skill levels of undergraduate students (3 and 4th grades) attending to various vacational and technical education departments of Gazi University: communication skills, problem-solving, girisimci olma, social skills, scientific thought skills, critical thinking.

Limitations: The study is carried out during the academical year of 2006-2007 at Gazi University Faculty of Technical education (departments of electronics, computer, electricity, automotive, construction), Faculty of commerce and tourism (department of accomadation) and Faculty of Vocational education (department of dress). The sample was third and fourth grade students.

MATERIALS AND METHODS

The study followed the scanning model. The data of the study were gathered through review of literature and the administration of the data colloection tool.

Sample of the study: The sample of the study includes a total of 301 undergraduate students attending to Gazi University Faculty of Technical education (departments of electronics, computer, electricity, automotive, construction), Faculty of commerce and tourism (department of accomadation) and Faculty of Vocational education (department of dress). The sample was third and fourth grade students. Table 1 presents the distribution of the sample.

Development of data collection tool and data collection: Initial data of the study were collected through literature review. Data on basic skills were analysed and transformed into a sclae form. The form was reviewed by Tuekish language and educational sciences specialists and reorganized based on their views. The form was administered to fifty-nine undergraduate students as a pilot implementation and the subjects are asked to evaluate the form and to provide their suggestions about the scale. The scale with seventy-two items was statistically analysed and some of the items with lower values were eliminated. Final form of the scale included a total of fifty-eight items. The scale was administrated to a different sample during 2005-2006 academical year. The results of the second pilot study indicated that some items needed rewording. Finally, the scale was administrated to 301 undergraduate students. The scale consisted of fifty-eight items, of which twenty-six items were positive and twenty-two are negative. The subjects were asked to respond the items using the five-point likert-type scale: Totally agree (5), agree (4), no idea (3), disagree (2) and toally disagree (1). Factor analysis and

Table 1: Distribution of the sample

Faculty	Department	No. of the students
Faculty of technical education	Electronics	36
Faculty of technical education	Computer	41
Faculty of technical education	Electricity	50
Faculty of technical education	Automotive	34
Faculty of technical education	Construction	40
Faculty of vocational education	Dress	50
Faculty of commerce and tourism	Accomadation	50
Total		301

Table 2: Load values of the dimensions

I. Dimension		II. Dimension		III. Dimension		IV. Dimension		V. Dimension		VI. Dimension		VII. Dimension		VIII. Dimension	
Item no	Factorload val.	Item no	Faktorload val.	Item no	Faktorload val.	Item no	Factorload val.	Item no	Factorload val.	Item no	Factorload val.	Item no	Factorload val.	Item no	Factorload val.
18	0.599	8	0.304	26	0.510	6	0.697	11	0.403	1	0.552	2	0.543	7	0.780
22	0.641	10	0.383	27	0.750	9	0.562	12	0.643	17	0.787	3	0.464	13	0.611
29	0.527	21	0.453	28	0.650	19	0.477	14	0.509	39	0.719	4	0.624	16	0.715
30	0.752	23	0.575	33	0.464			15	0.464			5	0.494		
31	0.592	24	0.659	34	0.588			20	0.543			37	0.429		
32	0.559	25	0.629												
36	0.719	35	0.532												
38	0.593	40	0.565												

Table 3: Percentages of the variance accounted by the dimensions and Cronbach a values

	Variance percentage (%)	Cronbach alpha
I. Dimension	9.964	0.8210
II. Dimension	7.115	0.6807
III. Dimension	6.248	0.6544
IV. Dimension	5.844	0.6158
V. Dimension	5.213	0.6571
VI. Dimension	4.820	0.6061
VII. Dimension	4.618	0.6331
VIII. Dimension	4.569	0.6168
Total	48.391	0.8442

the Cronbach alpha reliability test were used to identify the validity and reliability of the scale. For the statistical analyses, the SPSS (Statistical Programming for Social Sciences) 11.5 package program was employed. It was found that some items in the scale have realibility scores lower than. 60. In terms of validity of the scale, the results of the factor analysis showed that load values of the items in the scale range between .355 and .697. The dimensions identified through factor analysis are as follows: Dimension 1: communication skills, Dimension 2: problem-solving, Dimension 3: girisimcilik, Dimension 4: social skills, Dimension 5: scientific thought, Dimension 6: well-disciplined, Dimension 7: critical thinking, Dimension 8: being determined. Table 2 shows the load values of these eight dimensions and Table 3 presents the percentages of the variance accounted by these dimensions together with the Cronbach alpha scores.

Data analysis: The percentage of the variance accounted by the scale is found to be 48,391% and its Cronbach alpha relibility coefficient is found to be.8442. The minimum score that be taken is 40, while the maximum score is 200. The most negative score is 104 and the most positive score is 189. The lowest and highest scores in terms of each dimension are as follows: for Dimensions I. and II. 8-40, for Dimensions III.. V and VII. 5-25. for Dimensions IV.. VI. and VIII. 3-15. The significence level for the analyses is accepted as 0,05.

RESULTS AND DISCUSSION

Comparison of the levels of basic skills among groups: As shown by the results of the analysis, there is no statistically significant difference among the groups in terms of their levels of basic skills [F=2.099, p>0.05]. In other words, groups have similar basic skill levels. It indicates that subjects haev similar developmental characteristics.

As seen in Fig. 5 there is no statistically significant difference among the groups, however, the subjects from the department of electronics have the highest score while those from the department of accomadation have the lowest score.

Table 4: ANOVA results on the comparison of basic skill levels among groups

	Total	sd	Mean	F	p
Intergroup	2488.659	6	414.776	2.099	0.053
Intragroup	58109.129	294	197.650		
Total	60597.787	300			

Table 5: Distribution based on the results of scheffé test

	N	Mean
Group		1
Accommodation	50	141.1000
Computer	41	146.1951
Dress	50	146.7200
Construction	40	147.2750
Electricity	50	147.8800
Automotive	34	148.9412
Electronics	36	150.9722
p		0.114

Table 6: ANOVA results concerning the comparison of the groups' scores on the each domain of basic skills

		Total square	sd	Mean square	F	p
Communication	Intergroups	88.203	6	14.701	0.582	0.745
skills	Intragroups	7429.212	294	25.269		
	Total	7517.415	300			
Problem-solving	Intergroups	154.179	6	25.696	1.504	0.177
	Intragroups	5024.466	294	17.090		
	Total	5178.645	300			
Girisimci olma	Intergroups	111.405	6	18.567	1.607	0.145
	Intragroups	3396.383	294	11.552		
	Total	3507.787	300			
Social skills	Intergroups	10.349	6	1.725	.0669	0.675
	Intragroups	758.382	294	2.580		
	Total	768.731	300			
Scientific thought	Intergroups	218.103	6	36.351	5.057	0.000 *
	Intragroups	2113.425	294	7.189		
	Total	2331.528	300			
Being disciplined	Intergroups	38.340	6	6.390	1.146	0.336
	Intragroups	1639.354	294	5.576		
	Total	1677.694	300			
Critical thinking	Intergroups	99.186	6	16.531	2.740	0.013*
	Intragroups	1773.638	294	6.033		
	Total	1872.824	300			
Being determined	Intergroups	28.666	6	4.778	0.646	0.693
	Intragroups	2173.280	294	7.392		
	Total	2201.947	300			

Table 7: Results of the Scheffé Test on scientific thought

(I) Group	(J) Group	Differences in means (I-J)	sd	p	95% reliability range	
1Computer	2	-0.7351	0.56489	0.945	-2.7543	1.2841
	3	-1.2785	0.61238	0.629	-3.4674	0.9105
	4	0.4449	0.56489	0.996	-1.5743	2.4641
	5	1.4849	0.56489	0.332	-0.5343	3.5041
	6	-0.5187	0.62190	0.995	-2.7416	1.7043
	7	0.2799	0.59585	1.000	-1.8500	2.4097
2Electricity	1	0.7351	0.56489	0.945	-1.2841	2.7543
	3	-0.5433	0.58605	0.990	-2.6381	1.5515
	4	1.1800	0.53623	0.565	-0.7367	3.0967
	5	2.2200	0.53623	0.010	0.3033	4.1367
	6	0.2165	0.59598	1.000	-1.9139	2.3468
	7	1.0150	0.56876	0.785	-1.0180	3.0480
3Electronics	1	1.2785	0.61238	0.629	-0.9105	3.4674
	2	0.5433	0.58605	0.990	-1.5515	2.6381
	4	1.7233	0.58605	0.199	-0.3715	3.8181
	5	2.7633	0.58605	0.001	0.6685	4.8581
	6	0.7598	0.64118	0.965	-1.5321	3.0517
	7	1.5583	0.61595	0.383	-0.6434	3.7600

Table 7: Continued

4 Dress	1	-0.4449	0.56489	0.996	-2.4641	1.5743
	2	-1.1800	0.53623	0.565	-3.0967	0.7367
	3	-1.7233	0.58605	0.199	-3.8181	0.3715
	5	1.0400	0.53623	0.709	-0.8767	2.9567
	6	-0.9635	0.59598	0.855	-3.0939	1.1668
	7	-0.1650	0.56876	1.000	-2.1980	1.8680
5 Accommodation	1	-1.4849	0.56489	0.332	-3.5041	0.5343
	2	-2.2200	0.53623	0.010	-4.1367	-0.3033
	3	-2.7633	0.58605	0.001	-4.8581	-0.6685
	4	-1.0400	0.53623	0.709	-2.9567	0.8767
	6	-2.0035	0.59598	0.083	-4.1339	0.1268
	7	-1.2050	0.56876	0.611	-3.2380	0.8280
6 Automotive	1	0.5187	0.62190	0.995	-1.7043	2.7416
	2	-0.2165	0.59598	1.000	-2.3468	1.9139
	3	-0.7598	0.64118	0.965	-3.0517	1.5321
	4	0.9635	0.59598	0.855	-1.1668	3.0939
	5	2.0035	0.59598	0.083	-0.1268	4.1339
	7	0.7985	0.62541	0.950	-1.4370	3.0340
7 Construction	1	-0.2799	0.59585	1.000	-2.4097	1.8500
	2	-1.0150	0.56876	0.785	-3.0480	1.0180
	3	-1.5583	0.61595	0.383	-3.7600	0.6434
	4	0.1650	0.56876	1.000	-1.8680	2.1980
	5	1.2050	0.56876	0.611	-0.8280	3.2380
	6	-0.7985	0.62541	0.950	-3.0340	1.4370

Table 8: Results of the Scheffé Test on critical thinking

(I) Group	(J) Group	Differences in means (I-J)	sd	p	95% reliability range	
1 Computer	2	-0.4917	0.51749	0.964	-2.0281	1.0447
	3	-0.5373	0.56100	0.962	-2.2028	1.1283
	4	-0.2117	0.51749	1.000	-1.7481	1.3247
	5	1.0883	0.51749	0.354	-0.4481	2.6247
	6	-0.7023	0.56972	0.881	-2.3937	0.9891
	7	-0.2317	0.54586	1.000	-1.8523	1.3889
2 Electricity	1	0.4917	0.51749	0.964	-1.0447	2.0281
	3	-0.0456	0.53687	1.000	-1.6395	1.5484
	4	0.2800	0.49123	0.998	-1.1784	1.7384
	5	1.5800	0.49123	0.024	0.1216	3.0384
	6	-0.2106	0.54598	1.000	-1.8315	1.4104
	7	0.2600	0.52103	0.999	-1.2869	1.8069
3 Electronics	1	0.5373	0.56100	0.962	-1.1283	2.2028
	2	0.0456	0.53687	1.000	-1.5484	1.6395
	4	0.3256	0.53687	0.997	-1.2684	1.9195
	5	1.6256	0.53687	0.042	0.0316	3.2195
	6	-0.1650	0.58738	1.000	-1.9089	1.5788
	7	0.3056	0.56427	0.998	-1.3697	1.9808

Table 8: Continued

4 Dress	1	0.2117	0.51749	1.000	-1.3247	1.7481
	2	-0.2800	0.49123	0.998	-1.7384	1.1784
	3	-0.3256	0.53687	0.997	-1.9195	1.2684
	5	1.3000	0.49123	0.116	-0.1584	2.7584
	6	-0.4906	0.54598	0.973	-2.1115	1.1304
	7	-0.0200	0.52103	1.000	-1.5669	1.5269
5 Accommodation	1	-1.0883	0.51749	0.354	-2.6247	0.4481
	2	-1.5800	0.49123	0.024	-3.0384	-0.1216
	3	-1.6256	0.53687	0.042	-3.2195	-0.0316
	4	-1.3000	0.49123	0.116	-2.7584	0.1584
	6	-1.7906	0.54598	0.020	-3.4115	-0.1696
	7	-1.3200	0.52103	0.151	-2.8669	0.2269
6 Automotive	1	0.7023	0.56972	0.881	-0.9891	2.3937
	2	0.2106	0.54598	1.000	-1.4104	1.8315
	3	0.1650	0.58738	1.000	-1.5788	1.9089
	4	0.4906	0.54598	0.973	-1.1304	2.1115
	5	1.7906	0.54598	0.020	0.1696	3.4115
	7	0.4706	0.57293	0.983	-1.2304	2.1716
7 Construction	1	0.2317	0.54586	1.000	-1.3889	1.8523
	2	-0.2600	0.52103	0.999	-1.8069	1.2869
	3	-0.3056	0.56427	0.998	-1.9808	1.3697
	4	0.0200	0.52103	1.000	-1.5269	1.5669
	5	1.3200	0.52103	0.151	-0.2269	2.8669
	6	-0.4706	0.57293	0.983	-2.1716	1.2304

Comparison of the groups' scores on the each domain of basic skills: As shown in Fig. 6, in terms of five domains of basic skills, there is no statistically significant difference among the groups: communication skills [F=0.582], problem -solving [F=0.177], girisimcilik [F=0.145], social skills [F=0.675], being disciplined [F=0.336] and being determined [F=0.693]. However, there are statistically significant differences among groups in terms of two basic skill areas, namely scientific thought [F=0.000] and critical thinking [F=0.013]. In order to determine the groups that differ significantly the Scheffé test was employed and its results are given in Fig. 7 and 8.

As seen in Fig. 7, in terms of levels of scientific thought, there are statistically significant differences among the subjects attending to the departments of accomadation, electricity and electronics.

Figure 8 shows that there are statistically significant differences between the subjects from the department of accomadation and those from the department of electricity and between the subjects from the department of electronics and those from the department of automotive.

CONCLUSION

This study realized the following points:

- A new scale was developed to identify the level of basic skills.
- It is found that the subjects' levels of basic skills are in the range of mean indicating that it is neither negative nor positive.
- There is no statistically significant difference among the subjects from different departments. However, the scores of the subjects can be given as follows from the highest to the lowest: department of Electronics, department of Elecricity, department of Automotive, department of construction, department of dress, department of computer and department of accomadation.
- There are statistically significant differences among the subjects in terms of scientific thought. This difference is positive for the departments of electronics and of electricity but negative for the department of accomadation.

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- There are also statistically significant differences among the subjects in terms of critical thinking.

In terms of having basic skills, the subjects from the departments of electronics, of electricity and of automotive have higher levels of scores. Those from the department of accomadation have the lowest score on these basic skills.

In order to improve these basic skills teacher training institutions should pay attention to them. However, basic skills should be investigated in order to have much more comprehensive knowledge on these basic skills. Studies may be carried out using not only a single testing tool but a variety of testing techniques.

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