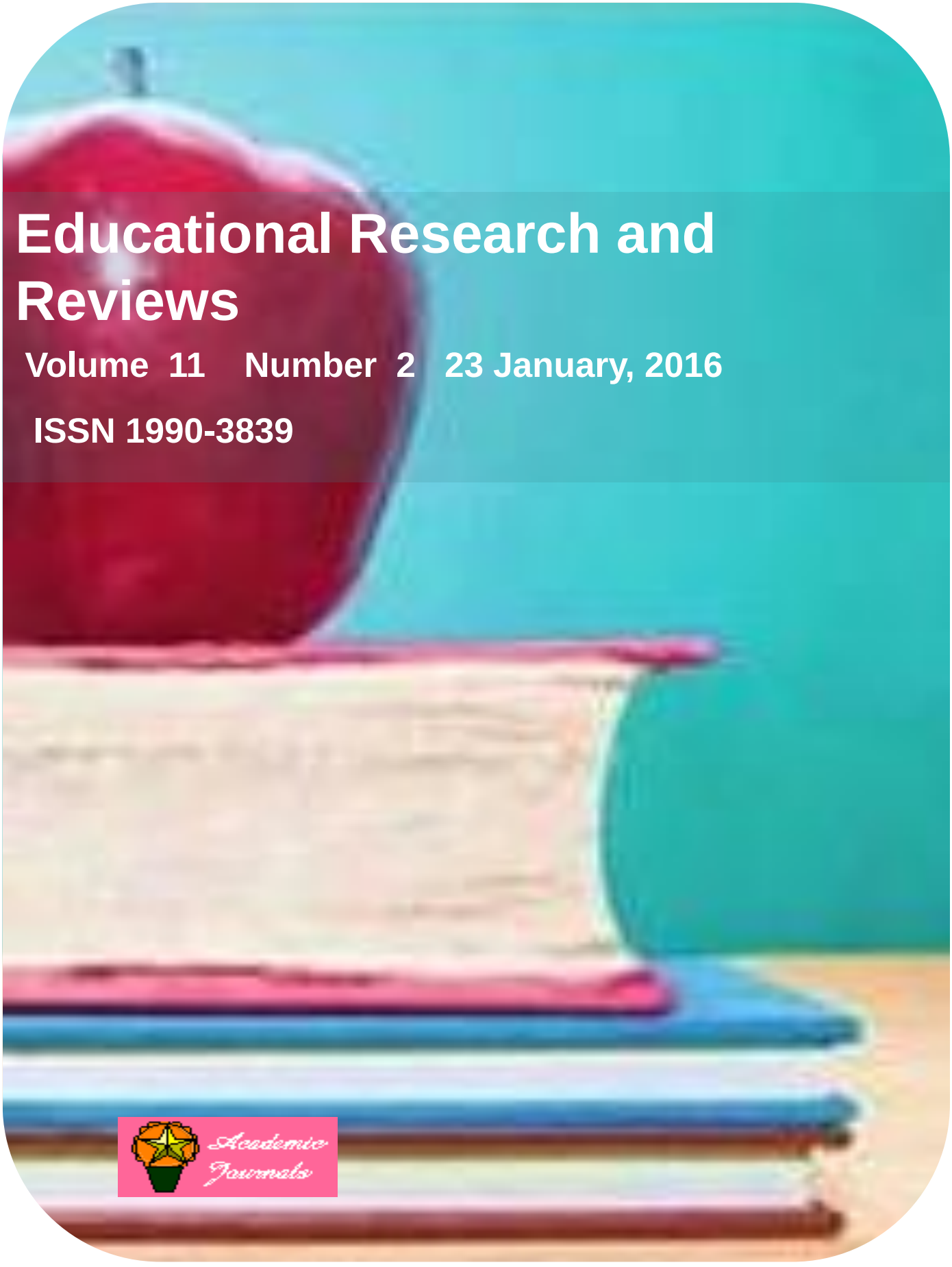

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Full Length Research Paper

Effects of pre-service information technologies (IT) teachers' thinking styles on their use of information and communication technology (ICT)[i]

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Thinking styles are considered as approaches and tendencies of individuals toward various problems, incidents, phenomenon and variables which they face through their thinking processes. Preservice teachers are expected to be capable of using information and communication technologies (ICT) in intra- and extra- curricular activities and be a role model to their students. In this regard, it is important to investigate the relationship between thinking styles of preservice teachers from the Department of Computer Education and Instructional Technology (CEIT) department who are expected to utilize from the ICT and their attitudes toward ICT. The present study aims to investigate thinking styles of preservice teachers from the CEIT department and their attitudes toward the ICT and the relationship between these two variables. According to the present study's results, preservice teachers at most prefer innovative and visionary "*Innovative thinking style*" which deals with indetermined indefinite works; at least prefer "*Traditionalist thinking style*" which is subject to certain codes and more realists. Whereas gender and grade level variables have no any effect on thinking style preferences; academic success level has statistically significant difference. It was observed that attitudes of participants regarding utilization from the ICT in education was rather high; gender and grade variables have no effect on their attitude toward the ICT; there is positive and proportional relationship between academic success levels and their attitude toward the ICT. Moreover, as perception levels of preservice teachers regarding innovative thinking style increases, their attitude toward the ICT enhances. On the contrary, their perception levels regarding traditionalist thinking style increases, their attitude toward the ICT is affected adversely.

Key words: Thinking styles, information and communication technologies, education technologies, computer usage in education, Computer Education and Instructional Technology (CEIT).

INTRODUCTION

Thinking style is the way in which a person uses his talents. It is considered as way of preference rather than using talent in the narrow meaning. Therefore, thinking styles cannot be classified in either as good or bad; it is

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only possible to talk about their differences (Sternberg, 1994). Thinking style is regarded as approach and tendency displayed by individuals toward various problems, incidents, phenomenon and variables which they experience as result of mental processes. Sternberg (1994) define thinking styles as expression of preference regarding how a person could use his talents in an effective way. Thinking styles are not talent or intelligence; instead they are way of usage talent or intelligence (Fer, 2005).

Thinking styles vary from one person to another. While individuals are classified in terms of this angle, it is common to assess them as high or low level of various characteristics rather than they have this or that thinking style. When individuals face a necessity to resolve a problem, or when they need to make a decision, they think different from each other and search for solutions. According to special circumstances, they use some of them at high level, or sometimes at low level.

Some studies conducted by researchers to define way of thinking applied by individuals suggest numbers of theories regarding thinking style (Holland, 1973; Renzulli and Smith, 1978). Thirteen thinking styles in 5 different dimensions determined according to the Sternberg (1997)'s Mental Personality Theory are presented in Table 1 (Stenberg, 1997).Thinking styles of individuals may vary according to their way of life and time; and they can be shaped by their current conditions (Yıldız, 2012). Moreover, thinking styles is essential personal difference variable which affects their success in academic and business lives (Dinçer and Saracaloğlu, 2011).

Integration of the information and communication technologies (ICT) with the educational activities is defined as utilization of ICT tools and equipment which makes learning process more effective and to reach teaching targets (Cartwright and Hammond, 2003). Effective factors on this process are reported as ICT tools and having access to them; competent manpower capable of using these tools, teaching program and education activities (Koçak-Usluel and Demiraslan, 2005). Beside the fact that courses in which ICT applied are more interesting and fun, outcomes of learning process is more lasting (Yiğit, 2004). One of the indispensable factors of education, teachers' qualifications play significant role in success of the education system (Korkmaz and Demir, 2012). Teaching personnel are required to utilize from new ICT effectively and productively so that they can raise competent and experienced students equipped with quality information (Turan and Çolakoğlu, 2008). Teachers who facilitate thinking process of students establish learning environments which mobilize individual thinking by catalyzing discussions and opinion exchange in these arenas hosting different opinions (Von, 1983; Çubukçu 2004).

In this regard, thinking styles preferred by teachers play significant role in CIT activities utilized in learning-teaching environment.

Erdemir et al. (2009) reported in their study on ICT that preservice teachers consider themselves sufficient with regard to ICT usage in teaching activities; and that whereas they are capable of preparing basic teaching materials, they experience difficulty with complex and multi-purpose materials. Similarly, Cüre and Özdener (2008) in one of their studies concluded that teachers are not knowledgeable in setup and operation of educational software adequately in teaching process. It is possible to encounter numerous results in the literature similar to this conclusion.

According to the relevant literature search results, there are vast amount of research on thinking styles and usage of information and communication technologies. There are several researches investigating the relationship between thinking styles of teachers and preservice teachers and their social skills, teaching methods, knowledge on natural sciences, their attitude toward using laboratory in terms of various variables (Duman and Çelik, 2011; Yıldız, 2012; Paliç and Rize, 2011; Balgalmış and Baloğlu, 2010; Dinçer and Saracaloğlu, 2011).

However, there is no study found, which investigate the relationship between thinking styles and usage of the ICT. In our contemporary information age, it is necessary to utilize from information and communication technologies especially in education activities effectively. Teachers who are the most essential stakeholder in the education process are the one who will integrate CIT with teaching activities. Thinking styles preferred by teachers are effective on application of CIT in teaching activities. At the same time in determination of tool, equipment and methods used in education environment, thinking styles of teachers are significant drive in choices. Accordingly, efficient thinking skills are necessary for teachers in planning process of education to acquire data and knowledge that can be used in selection of teaching techniques and materials and in their evaluation.

In this regard, it is important to investigate the relationship between thinking styles of preservice teachers who are pioneers of execution of education activities and their competency in usage of ICT. Thus, new structuring possibilities such as change in curriculum or arrangement of course content would be available in development of new thinking styles, which enable pre-service teachers to use information and communication technologies in learning and teaching activities more effectively. Amongst the departments in which teachers and preservice teachers are expected to use information technologies at highest level is undoubtedly is the Computer Education and Instructional Technologies Education (CEIT) Department. Therefore, research data was especially collected regarding preservice teachers from the CEIT department. Moreover, in order to determine whether the education given to preservice teachers from the CEIT department along the 4-year period make difference on their ICT and Thinking Styles,

Table 1. Demographic Characteristics of preservice teachers from the CEIT department

Variable	Characteristics	F	%
Gender	Male	88	47.3
	Female	98	52.7
Grade	1	41	22.0
	2	51	27.4
	3	46	24.7
	4	48	25.8
Academic success	1.8-2.41	32	17.2
	2.42-3.03	117	62.9
	3.04-3.67	37	19.9
Total		186	100

1st, 2nd, 3rd and 4th grade students from the CEIT department were included in the present research. The purpose of the present research is to investigate thinking styles, their attitudes toward the ICT and the relationship between thinking styles and their attitude toward the ICT. To this general end, following targets were set:

1. What are the thinking styles of preservice teachers from the CEIT department?
2. Is there a relationship between thinking styles of preservice teachers from the CEIT department and their demographic characteristics (gender, grade level, academic success level)?
3. What is the attitude of the preservice teachers from the CEIT department toward Information Technologies?
4. Do attitudes of the preservice teachers from the CEIT department toward the Information Technologies vary according to variable of gender, grade level and academic success level?
5. Do attitudes of the preservice teachers from the CEIT department toward the Information and Communication Technologies display significant difference with respect to their thinking styles?

METHODOLOGY

In this study which investigates whether thinking styles of the preservice teachers from the CEIT department and their usage of information and communication technologies in education exhibit difference in terms of their gender, department, age and computer usage levels, and the relationship between thinking styles and attitudes of the CEIT preservice teachers toward the ICT, descriptive screening model was utilized. In these models, the situation subject of the research is reported within its circumstances (Karasar, 2009).

Study group

Population of the research in the screening model is composed of preservice teachers from the CEIT department of Educational Sciences Faculty at the Ahi Evran University during 2014 to 2015 academic year. Whole population was included in the study as sampling group. Therefore, no any sampling method was used. Information and survey forms were distributed to 186 preservice teachers in internet environment. Distribution of the study group in terms of gender, grade, and academic success levels was summarized in Table 1.

According to the characteristics of the participant preservice teachers, in terms of gender distribution, number of male (47.3%) and female (52.7%) participants were almost equal; similarly, it was observed that grade distribution is close to each other. In terms of academic success levels, majority of the population (62.9%) remains in the score range of 2.42 to 3.03; 17.2% of population was in the score range of 1.8 to 2.41; and 19.9% was in the range of 3.04 to 3.67.

Data collection tools

While the study utilizes from the "*Thinking Styles Scale*" in evaluation of thinking styles of preservice teachers from the CEIT department; it utilizes from the "Information and Communication Technologies Attitude Scale" to evaluate their attitude; and "Personal Information Form" to determine their demographic characteristics.

Thinking styles scale

Thinking styles scale adapted to Turkish by Sünbül (2004) is consisted of 94 articles. Items in this scale were structured based on five-scale Likert model and for each item following options were given: "Always (1)", "Frequently (2)", "Sometimes (3)", "Seldom (4)" and "Never (5)". Thinking styles scale which aims to determine thinking styles of students are composed of 13 thinking styles:

1. Functional Style: Subjective thinking, rule-based thinking, judgmental thinking.
2. Formal Style: Singularist, progressive, equivalent, irregular.
3. According to Level: Integrative thinking, detail-oriented thinking.
4. According to Scope: Introvert, Extrovert.
5. According to Tendency: Innovative and traditionalist thinking styles.

Within the scope of the present study, amongst 13 different thinking styles, effects of Introvert, Extrovert, Traditionalist and Innovative thinking styles on the ICT were investigated. Validity of the structure

Table 2. ICT Scale factor items.

Variable	Scale Items
Effect of the ICT on education and teaching	1.3.4.8.9.10.11.12.13.15.18.19.20.23.24.25.27.28.29.30
Obstacles in utilization of the ICT	2.5.6.7.14.16.17.21.22.26.31

Table 3. Descriptive Statistic Results of preservice teachers from the CEIT department with regard to their thinking style scores.

Variable	N	Minimum	Maximum	X	Sd
Introvert	186	14	35	25.55	3.88
Extrovert		8	35	26.65	4.06
Innovative		16	35	27.55	3.94
Traditionalist		13	34	22.56	3.88

(basic components) was performed through factor analysis. In selection of items included in published scale, Varimax factors analysis, item test, and item residual correlations were taken into consideration. As a result of these studies, it was confirmed that 13 dimensions of the scale and explained variance amount were sufficient; and moreover that factor loads of each item pre- and post-rotation and item-sub test and residual correlations of items were sufficient. The variance explained by 13 factors together is found as 51.03%. In the presented scale, all included article's factor load is above 0.40. Moreover, Cronbach's α reliability coefficient estimated to determine internal consistency ranges for all sub-scales between 0.70 and 0.86.

Attitude scale toward the ICT

In order to measure attitudes of preservice teachers toward the ICT, the Attitude Scale toward the ICT, which was developed and its reliability and validity analyses were conducted by Cavas et al. (2009) was utilized. The items included in the scale were assigned following options based on Likert Scale; "Strongly Agree (1)", "Agree (2)", "Not Sure (3)", "Disagree (4)" and "Strongly Disagree (5)". Data used in development process of the scale were collected from 1,071 primary school teachers distributed equally to 7 different geographical territories across Turkey. The scale is composed of two sub-factors of "Effect of the ICT on Education and Teaching" (20) and "Obstacles to utilization of the ICT" (11). Whereas the first factor was including positive expressions, the second factor was including negatives. High scores of the first factor suggest that individuals have positive attitude regarding ICT has positive effect on Education and Teaching; and high scores of the second factor suggest that individuals have negative attitude regarding obstacles of utilization of the ICT in education. While internal consistency coefficient of the first factor was estimated at .92; internal consistency coefficient of the second factor was estimated at 0.79; and internal consistency coefficient of the whole scale was estimated as0 .91 (Table 2).

Data collection and analysis

Data acquired within the research scope was run in the The Statistical Package for The Social Sciences (SPSS) Package Software and all hypotheses were tested based on 0.95 reliability level (p = 0.05). Before data analysis, within the scope of the normality test of data, in order to measure whether each dependent variable displays normal distribution, Kolmogorov-Smirnov normality test results were examined. Since Kolmogorov-Smirnov normality test analysis results indicate normal distribution for gender and grade level variables; since parametric tests does not display normal distribution for academic success level variables, non-parametric tests were used.

In determination of thinking styles of preservice teachers and their attitudes toward the ICT, descriptive statistics of frequency (f), percentage (%), average (X) and standard deviation (Sd) values were used. In order to evaluate the relationship between demographic characteristics (gender, grade level, academic success level), thinking styles and attitude of preservice teachers toward the ICT, t-test, one-way Anova test and Kruskal Wallis tests were utilized. In order to determine whether attitudes of preservice teachers toward the ICT displays difference with regard to their thinking styles, Pearson r correlation tests was utilized. Statistical significance of difference and relationships were investigated at $p<.05$ level. Moreover, for ICT's effect on education and teaching in the attitude scale toward the ICT, 20 to 35 score range was considered "very low", 37to 53 range "low"; 54 to 69 range "medium"; 70 to 85 range "high"; 86 to 100 range was considered as "very high". On the other hand, for obstacles to use the ICT in educational activities, the same score ranges were used but in reverse way.

FINDINGS AND DISCUSSION

Findings obtained as a result of the present research were enumerated below:

What are the thinking styles of preservice teachers from the CEIT department?

In determination of thinking styles of preservice teachers from the CEIT department, statistical results related with average scores received from sub-dimensions of thinking style scales of introvert, extrovert, traditionalist and innovative were exhibited in Table 3.

According to Table 3, it was observed that preservice teachers from the CEIT department adopt innovative and visionary innovative thinking style ($\bar{X} = 27.55$), which deals with indetermined indefinite works; extrovert

thinking style ($\bar{X} = 26.65$), which likes works necessitating cooperation; introvert thinking style ($\bar{X} = 25.55$), which likes less social interaction; and traditionalist thinking style ($\bar{X} = 22.56$), which likes working alone, conforming to rules and being realistic, respectively. As it can be comprehended from the Table 3, preservice teachers from the CEIT department displayed the highest average score with "innovative thinking style"; and the lowest average score displayed with "traditionalist thinking style". Based on this finding, it is possible to conclude that preservice teachers prefer to participate in activities which necessitate innovation, vision, and productivity in education activities; and on the other hand they do not like to follow rigid rules and they abstain from conventional works.

Is there relationship between thinking styles of the preservice teachers from the CEIT department and their demographic characteristics (gender, grade and academic success level)?

a. Whether thinking styles of preservice teachers from the CEIT department display significant difference according to gender?

T-test analysis results conducted for independent groups to determine whether thinking styles of preservice teachers from the CEIT department display statistically significant difference according to their gender were exhibited in Table 4.

Based on Table 4, it can be concluded that thinking styles preferred by preservice teachers from the CEIT department do not exhibit significant difference according to the gender variable. When thinking style average scores of preservice teachers are considered, the highest scores were displayed by the innovative (27.94) and extrovert (27.08) thinking styles, the lowest average scores were displayed by traditionalist thinking style adopted by male respondents. These results suggest that thinking styles of preservice teachers from the CEIT department do not change according to their gender. While this finding is confirmed by the research results reported by Çubukçu (2004), Duman and Çelik (2011), Saracaloğlu et al. (2008) and Düzgün (2011) they contradict with results reported by Dinçer and Saracaloğlu (2011), Balgalmış and Baloğlu (2010) and Sünbül (2004). Yıldızlar (2010) reached to a conclusion in the study under title of "Thinking Styles of Different Preservice Teachers from Various Cultures" that male preservice teachers in Turkey prefer more introvert thinking style in comparison to female preservice teachers.

b. Whether thinking styles of preservice teachers from the CEIT department display significant difference according to their grade level?

Results of the one-way variance analysis conducted for independent groups to determine whether thinking styles of preservice teachers from the CEIT department display statistically significant difference according to their grade levels were presented in Table 5.

Table 5 suggests that there is no significant difference between thinking styles of preservice teachers from the CEIT department and their grade levels. According to thinking style average scores of preservice teachers, it is seen that 4th grade Preservice teachers who prefer "innovative thinking style" (28.33) have the highest average score; the 4th graders who prefer "traditionalist thinking style" (21.92) have the lowest average score. Based on these results, it is possible to conclude that thinking styles preferred by preservice teachers from the CEIT department do not vary according to their grade variable. Dinçer and Saracaloğlu (2011) report a significant difference with only introvert thinking style with respect to the grade variable. Moreover, the researchers stated that 4th grade students prefer internal thinking style more frequently compared to the 1st graders. Similarly, Buluş (2006) reports statistically significant difference among introvert, extrovert and conservative thinking styles according to grade levels.

c. Whether thinking styles of preservice teachers from the CEIT department display significant difference according to their academic success level?

Since acquired data during the study was distributed normally with respect to academic success level variable, non-parametric test was conducted. In order to determine whether thinking style of preservice teachers from the CEIT department display statistically significant difference according to their academic success levels, results of the Kurskal Wallis analysis conducted for independent groups were summarized in Table 6.

When thinking style average scores of preservice teachers with respect to their academic success levels are considered, it can be observed that the highest average score of 111.36 was obtained by the preservice teachers with traditionalist thinking style whose academic success score in the range of 3.04 to 3.67. The lowest average score of 73.02 was obtained by the preservice teachers with innovative thinking style whose academic success score in the range of 1.8 to 2.41. According to the Kruskal Wallis Test Results, which was conducted to determine whether there is significant difference between thinking styles of preservice teachers and their academic success scores, there is no significant difference between academic success scores of preservice teachers and introvert ($p=0.996$) and extrovert ($p=0.07$) thinking style scores.

On the contrary, there is a significant difference was found between academic success scores and innovative ($p=0.013$) and traditionalist ($p=0.01$) thinking style scores. In other words, while introvert and extrovert thinking styles of preservice teachers from the CEIT department do not

Table 4. t-test analysis results of preservice teachers from the CEIT department according to their thinking style average scores with regard to their gender.

Thinking style	Gender	N	X	S	t	p
Introvert	Male	88	25.89	4.07	1.11	0.27
	Female	98	25.26	3.70		
Extrovert	Male	88	27.08	4.08	1.39	0.17
	Female	98	26.26	4.03		
Innovative	Male	88	27.94	4.03	1.30	0.20
	Female	98	27.19	3.85		
Traditionalist	Male	88	22.43	4.18	-0.44	0.66
	Female	98	22.68	3.61		

Table 5. One-way variance analysis results of preservice teachers according to their Thinking style average scores with regard to the grade levels.

Thinking style	Grade	N	X	S	T	p
Introvert	1	41	25.44	3.74	0.05	0.98
	2	51	25.45	3.82		
	3	46	25.72	3.97		
	4	48	25.60	4.09		
Extrovert	1	41	26.71	4.27	0.11	0.95
	2	51	26.49	3.61		
	3	46	26.91	3.60		
	4	48	26.50	4.81		
Innovative	1	41	27.76	4.20	1.15	0.33
	2	51	27.04	4.42		
	3	46	27.11	3.27		
	4	48	28.33	3.74		
Traditionalist	1	41	23.00	3.54	0.72	0.54
	2	51	22.53	4.38		
	3	46	22.89	3.71		
	4	48	21.92	3.77		

Table 6. Kruskal Wallis Test Results Regarding Thinking Styles Average Scores of Preservice Teachers According to Their Academic Success

Academic Success Level	N	Average Distribution			
		Introvert	Extrovert	Innovative	Traditionalist
1.8-2.41	32	94.02	74.48	73.02	104.94
2.42-3.03	117	93.55	98.19	101.36	84.72
3.04-3.67	37	92.89	95.11	86.35	111.36
Kr. Wallis Chi-Sq. (χ2)		0.008	5.33	8.64	9.22
Z		2	2	2	2
p		1.00	0.07	0.01	0.01

*p<=0.05.

Table 7. Descriptive statistic results regarding attitude of preservice teachers toward the ICT.

Variable	Minimum	Maximum	X	Sd
Effect of ICT on education and teaching	186 32	100	83.03	9.74
Obstacles before utilization of the ICT	11	50	23.96	6.01

Table 8. t-test Analysis Results of Preservice Teachers Regarding ICT Average Scores According to Their Gender

	Gender	N	X	S	t	p
Effect of the ICT on Education and Teach	Male	88	82.68	11.79	-0.46	0.64
	Female	98	83.35	7.48		
Obstacles before Utilization of the ICT	Male	88	23.73	6.85	-0.50	0.62
	Female	98	24.17	5.17		

differ according to their academic success sores, innovative and traditionalist thinking styles differ according to their academic success scores. Whereas Dinçer and Saracaloğlu (2011) reach a conclusion that there is a negative relationship between global and conservative thinking styles preferred by preservice teachers and their academic success levels; no significant relationship was determined with between thinking styles and academic success levels. Similarly, Buluş (2005) reported a relationship only between preservice teachers who prefer anarchical and conservative thinking style and their academic success scores. In other research conducted by Lam (2000), a conclusion which suggests a positive relationship between global thinking style and academic success has been drawn.

3. What are the attitudes of preservice teachers from the CEIT department toward the information technologies?

In Table 7, findings regarding attitudes of preservice teachers from the CEIT department toward the ICT were summarized. According to Table 7, when attitude of preservice teachers from the CEIT department toward the ICT are considered, it can be observed that average scores of the effect of the ICT on education and teaching was rather high (83.03). On the contrary, average scores regarding obstacles preventing utilization of the ICT are at very low level (23.96). Accordingly, it is possible to state that attitudes of preservice teachers from the CEIT department toward the ICT were at very high level. In the study of Korkmaz and Demir (2012) conducted on teachers from various branches, it was reported as well that teachers' attitudes toward obstacles before utilization of the ICT were at high level. Çetin et al. (2012) reported in their study that although preservice teachers do not find themselves insufficient regarding usage of technology, they stated that they do not have knowledge on using technology at sufficient level. Similarly, Çuhadar and Yücel (2010), in their study in which qualitative data concerning usage of ICT by preservice foreign language teachers for teaching purposes was used, stated that 82% of preservice teachers consider themselves sufficient regarding usage of the ICT.

4. Is there any relationship between attitudes of preservice teachers from the CEIT department toward the ICT and their demographic characteristics (gender, grade and academic success level)?

a. Whether attitudes of preservice teachers from the CEIT department toward the ICT display significant difference according to gender?

Table 8 summarizes findings concerning whether attitudes of preservice teachers from the CEIT department toward the ICT differ according to their gender. It can be observed from Table 8 that attitudes of preservice teachers toward effect of the ICT on education and teaching (t=-.464. p>.005) and toward obstacles before usage of the ICT (t=-.504. p>.005) do not differ significantly according to gender variables. At this point, it is possible to conclude that gender is not a significant determinant on attitudes of preservice teachers from the CEIT department toward the ICT. Similarly, Korkmaz and Demir (2012) report that gender has no any effect on attitudes of teachers toward both effect of ICT on education and teaching and obstacles before utilization of ICT. On the contrary, Çetin et al. (2012) stated that technology competency average scores of male preservice teachers were higher compared to female preservice teachers. Along the same way, Çuhadar and Yücel (2010) reported that genders of foreign language preservice teachers were effective on their attitudes toward the ICT.

b. Do attitudes of preservice teachers from the CEIT department toward the ICT display difference according to their grade levels?

Results of the one-way variance analysis conducted to

Table 9. One-way variance analysis results regarding ICT average scores of preservice teachers according to their grade levels.

Thinking style	Grade	N	X	S	T	p
Effect of the ICT on education and teaching	1	41	81.83	5.97	1.40	0.25
	2	51	82.29	13.04		
	3	46	82.37	7.44		
	4	48	85.48	10.03		
Obstacles before utilization of the ICT	1	41	24.24	5.09	1.10	0.35
	2	51	24.20	6.99		
	3	46	24.80	5.11		
	4	48	22.67	6.38		

determine whether attitudes of preservice teachers from the CEIT department toward the ICT display statistically significance difference according to their grade levels were summarized in Table 9. Based on the Table 9, it is understood that attitudes of the preservice teachers from the CEIT department toward the ICT do not display significant difference according to their grade levels. Additionally, when average scores of preservice teachers regarding effect of the ICT on education and teaching are considered, it was observed that they have increased from the 1st grade to the 4th grade every year. This finding can be interpreted as the education received by preservice teachers from the CEIT department has positive effect on their attitude toward the ICT. However, it has been observed that average scores of preservice teachers regarding obstacles before utilization of the ICT have increased annually starting from the 1st grade. Thus, it is possible to conclude that grade levels of preservice teachers from the CEIT department have minor positive effect on their attitude toward obstacles before utilization of the ICT. Özarslan et al. (2013) and Çetin et al. (2012) have reported similar results regarding grade levels of preservice teachers.

c. Do attitudes of preservice teachers from the CEIT department toward the ICT display difference according to their academic success levels?

Data acquired during the study was not normally distributed with respect to academic success level variable. Therefore, it was found appropriate to conduct non-parametric tests. In order to determine whether attitudes of preservice teachers from the CEIT department toward the ICT display statistically significant difference according to their academic success levels, results of the Kurskal Wallis analysis, conducted for independent groups, were summarized in Table 10.

According to Table 10, it can be deducted that academic success levels of preservice teachers from the CEIT department do not make statistically significant difference on attitudes of preservice teachers toward effect of the ICT on education and teaching. However, preservice teachers academic whose success level is in the range of 1.8 to 2.41 have rather low average score (73.92) compared to the ones with higher academic success level (97.48 and 97.84). This result indicates that there is positive and proportional relationship between preservice teachers' academic success levels and their attitude toward the effect of the ICT on education and teaching (Table 11).

Moreover, it can be understood from Table 10 that academic success levels of preservice teachers from the CEIT department has statistically significant difference on their attitude toward obstacles before utilization of the ICT. Average score (119.06) of preservice teachers within the academic success range of 1.8 to 2.41 with regard to obstacles before utilization of ICT was found significantly higher compared to other preservice teachers with higher academic success level (85.59; 96.41). This can be interpreted as attitude of preservice teachers toward obstacles before utilization of the ICT changes according to their academic success levels. This result is supported by Kurfallı (2008)'s study which reports a significant relationship between teachers' education level and their information technology usage frequency.

5. Whether attitudes of preservice teachers from the CEIT department toward the ICT displays significant difference according to their thinking styles?

Table 12 summarizes analysis results regarding the relationship between thinking styles of preservice teachers and their attitude toward the ICT. According to Table 12, it can be seen that there is positive and moderate level of significant relationship between "innovative thinking style" and attitudes of preservice teachers from the CEIT department toward effect of the ICT on education and teaching ($r=0.378$. $p<0.01$). Accordingly, as innovative thinking style attitude scores of preservice teachers increase, their tendency to use the ICT in education activities increases as well. In some studies which investigate the relationship between the ICT and various attitudes, similar results were reported.

Korkmaz and Demir (2012) concluded that as self-

Table 10. Kruskal Wallis test results regarding ICT average scores of preservice teachers according to their academic success levels.

Academic success level	N	Average distribution	
		Effect of the ICT on education and teaching	Obstacles before utilization of the ICT
1.8-2.41	32	73.92	119.06
2.42-3.03	117	97.48	85.59
3.04-3.67	37	97.84	96.41
Kr. Wallis Chi-Sq. (χ2)		5.44	10.39
Z		2	2
p		0.07	0.01

*p<=0.05.

Table 11. Pearson correlation coefficient and relationship levels (Büyüköztürk, 2009).

Absolute value range (r)	Relationship level
0.00 – 0.30	Low
0.31 – 0.70	Medium
0.71 – 1.00	High

Table 12. The relationship between thinking styles of preservice teachers and their attitude toward the ICT.

Thinking styles		Introvert	Extrovert	İnnovative	Traditionalist
Effect of ICT on education and teaching	r	0.10	0.13	0.38**	0.00
	p	0.17	0.09	0.00	0.98
	N	186	186	186	186
Obstacles before utilization of the ICT	r	-0.03	-0.14	-0.32**	0.26**
	p	0.67	0.05	0.000	0.00
	N	186	186	186	186

sufficiency perceptions of teachers who participate in in-service training activities organized by the Turkish Ministry of National Education (MEB), their attitude toward the effect of the ICT on education increases as well. Cüre and Özdener (2008), who focused on the relationship between teachers' success in ICT application and their attitude toward the ICT, reported high level of positive and significant relationship. Similarly, Tuti (2005) found proportional relationship between computer self-sufficiency perceptions of teachers and their attitude toward the ICT.

A moderately significant and negative relationship was found between attitudes of preservice teachers from the CEIT department toward the ICT usage and innovative thinking style (r=-0.315. p<0.01). This finding supports the aforesaid results as well. As preservice teachers' innovative thinking style attitude score increases, on the contrary, their attitude toward usage of the ICT decreases. There is low level of positive significant relationship between attitudes of preservice teachers from the CEIT department toward obstacles before utilization of the ICT and traditionalist thinking style. This suggests that Preservice teachers with traditionalist thinking style do not have inclination to use the ICT in education activities.

Conclusion

The present study investigated and shed light on the relationship between thinking styles of preservice teachers from the CEIT department and their attitude toward the ICT. Study group included in this research using screening model consisted of 186 preservice teachers. Thinking Styles Scale and Attitude Scale for the ICT were used as data collection tool. Whether

there are statistically significant differences between thinking styles of preservice teachers and their attitude toward the ICT according to their genders, grades and academic success levels were investigated through these tools based on significance level of 0.05; and the relationship between these two variables was researched. As data collection tool, “Thinking Styles Scale” adapted to Turkish by Sünbül (2004) in order to determine thinking style preferences of preservice teachers; “Scale for Attitude toward ICT” adapted to Turkish by Cavas et al. (2009) in order to determine their attitude toward the ICT; and “Personal Information Forms” to determine demographic characteristics were utilized.

In data analysis, frequency (f), percentage (%), average (X) and standard deviation (Sd) values were used as descriptive statistics. In order to measure the relationship among thinking styles of preservice teachers, their attitudes toward the ICT and their demographic characteristics (gender, grade level, and academic success level), t-test, one-way Anova test and Kruskal Wallis tests were utilized. In exploration of behavior of attitudes of preservice teachers toward the ICT with respect to their thinking styles, Pearson r correlation test was conducted.

Preservice teachers from the CEIT department at most preferred innovative thinking style which likes to deal with indetermined indefinite works and which exhibits innovative and visionary characteristics; at least preferred traditionalist thinking style which likes to follow rules and which exhibits more realistic characteristic. Accordingly, preservice teachers from the CEIT department prefer to take part in applications which necessitate novelty, vision, and productivity in education activities; on the contrary, they do not tend to follow rules and avoid conventional works.

Thinking styles preferred by participants do not exhibit significant difference gender variable. Grade level variable, similarly, is not significantly different with respect to thinking styles preferred by participants. However, it was observed that average scores have changed at grade level even though it is at minor level. For instance, scores of preservice teachers taken from innovative thinking style from the 1st grade to the 4th grade have increased annually. Hence, it can be concluded that preservice teachers from the CEIT department become more innovative at the end of their education activities in the faculty.

When the relationship between thinking styles of preservice teachers and academic success scores is considered, average scores of innovative and traditionalist thinking styles display changes with respect to academic success score. Accordingly, it is possible to conclude that academic success score has effect on thinking styles adopted by preservice teachers. In this regard, it can be suggested that more appropriate applications to be applied during education activities for thinking styles of students must be designed and developed.

Application of ICT in educational activities can play significant role in developing education quality. In this regard, teachers have essential role at this point. Application of ICT by teachers in education at highest possible level could elevate quality of education. Teachers from CEIT department are the professionals who would contribute in extension of ICT application in educational activities. From this point of view, scope of the research is rather important. Average score of the preservice teachers from the CEIT department in regard to effect of the ICT on education and teaching was calculated as 83.03. On the contrary, their average score in regard to the obstacles before utilization of the ICT was calculated as 23.96. This situation indicates that attitude of preservice teachers from the CEIT department toward the ICT is rather high. Finally, it is possible to conclude that preservice teachers from the CEIT department are eager to ICT in education activities.

Attitude of preservice teachers from the CEIT department toward the ICT does not display significant difference according to their gender. Similarly, attitude of participants toward the ICT does not display significant difference according to their grade levels. However, grade level of participants is moderately effective on their attitude toward to usage of ICT in education. From the 1st grade to the 4th grade, attitude of preservice teachers toward the effect of the ICT on education has increased in positive meaning.

There is positive and proportional relationship between academic success levels of preservice teachers from the CEIT department and their attitude toward the effect of ICT on education and teaching. As academic success level increases, preservice teachers’ tendency to use the ICT in education activities increases. Moreover, attitudes of participants toward obstacles before usage of ICT vary according to their academic success levels. Preservice teachers with lower academic success level do not find usage of the ICT appropriate in education activities.

As a result of correlation calculation conducted to determine the relationship between attitudes of preservice teachers toward the ICT and their thinking styles, it was revealed that as innovative thinking style perception level increases; their attitude toward the ICT develops in the same way. On the contrary, while perception level regarding traditionalist thinking style increases, their attitude toward the ICT decreases. Based on the research findings, since education outputs are expected to be more qualified, the following proposals can be expressed:

1. Each individual adopts different thinking style. Education activities are required to be conducted by considering the fact that students do not adopt the same thinking style. Since the most frequently preferred thinking styles by students are extrovert and innovative thinking styles, it is suggested that more innovative and

imaginative thinking styles which requires cooperation must be used in education process that will be applied to preservice teachers.

2. By considering that thinking is an individual process, first of all it is necessary to allow preservice teachers to raise their awareness regarding their thinking styles. To that end, new courses based on thinking education must be included in the curriculum. In the present study, thinking styles of preservice teachers, their attitude toward the ICT, and the prevailing relationship among them were investigated; and the scope of the research was limited with the registered students from the CEIT Department of the Educational Sciences Faculty at the Ahi Evran University. The present study can be developed further by means of more extensive studies including larger preservice teacher population from the CEIT Departments of other universities.

3. The relationship among attitudes of preservice teachers toward the ICT and learning approaches of individuals, material design sufficiency and techno-pedagogical sufficiency can be investigated.

Conflict of Interests

The author have not declared any conflict of interests.

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An analysis of writing activities in the student workbooks of a secondary-level Turkish language course

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The purpose of this study is to analyze writing activities in the student workbooks of a secondary-level Turkish language course (grades 5 to 8) according to the principles of progressive writing. The study is descriptive and employs content analysis as a qualitative research paradigm. The writing activities of the books in this study all published by The Ministry of Education are categorized according to task, namely those involving sentence, paragraph and text-level writing; those focusing on spelling and punctuation; those which could not be categorized based on their instructions; and those based on their text types. The activities and their development from the 5 to 8th grades are examined. It is concluded that no principle of progression exists in the activities, except in those involving sentence-level writing tasks.

Key words: Writing activities, Turkish language student workbooks, content analysis.

INTRODUCTION

Writing can be described as an expressive tool that enables authors to articulate feelings, thoughts, wishes and imaginations. Özbay (2007) extends this definition and attributes to writing the quality of necessity, that is,writing as a process stemming from an inherent human need for expression. However, writing is not merely a process with different communicative, cognitive, and textual dimensions. In a democratic society, writing also corresponds to freedom of expression and social responsibility. Moreover, the permanent nature of writing is emphasized in the lives of individuals and nations (hence the saying, “spoken words fly away, written words remain), with humanity owing its accumulated knowledges and contemporary culture to their generational transfer via writing.

Given the indisputable significance of writing in the social world, its successful acquisition requires systematic instruction. A primary goal of Turkish language courses is to produce individuals capable of accurately and effectively articulating their feelings, thoughts, and wishes. These courses are being taught at all educational levels with an aim to equip students with writing skills. The development of basic writing and literacy skills is emphasized during the initial years of primary school; specifically, during the first grade of primary school writing is taught alongside reading, with listening and

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speaking abilities being supplemented by the family. During this period, students begin to practice sentence and text construction with an emphasis on grammar. In subsequent grades, students begin responding to writing tasks which rely upon their prior internalization of basic grammar, spelling and punctuation rules. As the grade level increases, learners obtain knowledges and practice skills related to topics such as phraseology and idea development (Göçer, 2011). In comparison to listening, speaking and reading skills, writing proficiency emerges at a later period with more difficulty. Despite the difficulty of developing effective writing skills, this process does not require extraordinary student characteristics. As Kavcar (1998) states that writing proficiency can be achieved within the appropriate learning environment through continuous practice and effort-in other words, anyone can master the ability to express him- or herself effectively in writing.

The Primary School Turkish Language Course Curriculum (Grades 6, 7 and 8; 2006) asserts that helping students produce different genres of writing such as short story, novel, and poetry is possible, although these genres require certain levels of creativity and individual talent which students may develop when provided technical knowledge of writing. Karatay (2011: 23) explains students' misconceptions of writing ability in the following way:

"*Learners believe that writing is a skill specific to certain individuals. Consequently, most of them believe that they do not have this skill and that they cannot be successful in writing. These considerations adversely affect their attitudes towards writing. These students should be convinced that writing is a skill that can be developed with some work. This is because the language itself is an innate capability unique to human beings, which is different in other living creatures. This capability should be trained in order for it as a whole or its sub-skills such as listening, speaking, reading and writing to be used effectively*" .

In general, courses and teachers play a significant role in students' development of writing skills. Moreover, these skills should not be treated as autonomous, that is, as existing separately from listening, reading and speaking skills. Like in any language education, all areas of learning are intertwined in Turkish language education. Achievement in each learning area supports achievement in another. Considering the fact that writing requires the use of knowledge, experience, and effective language, this process should be supported by activities involving listening/watching, speaking, reading and grammar. From this point of view, the curriculum should include the "application of writing rules, planned writing, writing different genres, evaluation of [one's] own writing, acquiring the habit of expressing [one]self in writing, spelling and punctuation rules and practices" (MEB, 2006: 7).

Like reading, writing occupies an important place in human life. The clear and concise writing of feelings, thoughts and information requires the development of a variety of mental capabilities. Students learn to rank, limit, regulate and write about their thoughts; moreover, they master punctuation and spelling rules through writing skills. As mentioned previously, writings ability closely correlates with listening, speaking and reading ability. Students improve writing ability through continuous reading, writing and self-evaluation (MEB, 2009). Moreover, the development of writing skill, which can be a long process, is only possible through a variety of writing practices and encouragement by teachers (MEB, 2006; MEB, 2009).

In order to acquire writing proficiency and further to evaluate student progress, process writing which involves clearly defined stages is of primary importance. Expected writing skill should correspond with grade level. Moreover, writing ability should improve as the educational level progresses, as should the complexity of texts which students are required to compose. Literacy training constitutes the first stage of writing education. After this stage, writing education gradually advances to sentence, paragraph and text-levels of complexity (Özbay, 2000).

Purpose of the study

The main purpose of this study is to investigate systematically specifically in accordance with the principles of progressive writing, the writing activities in student workbooks published by the Ministry of National Education (MONE) for a secondary-level Turkish language course.

METHODOLOGY

This section presents detailed information on this study's research model, data collection techniques and analysis of collected data.

Research model

A main objective of this study, which is descriptive in nature, is to theorize the concepts and relationships reflected by the collected data; hence, the content analysis method is employed. Şahin (2010) explains this method as the comprehensive analysis of a written or spoken text and symbols as well as, and its quantitative representation and verbal interpretation.

The construction of content analysis instructions

Four books published by the MONE are investigated in this study alongside six basic questions. Each of these questions is organized

according to a “theme” in the content analysis instructions. Various studies were employed in the construction of these questions/ themes (Coşkun, 2011; Çeçen, 2011; Göçer, 2011; Özbay, 2000). The selected themes were submitted to three experts for their investigation and comments.

One of the precautions to improve convincing effect of the study is to invite people to scrutinize the study who have general knowledge about the topic at focus and expertise in qualitative research. In this investigation, the expert critically analyses each step of the study from research design to data collected as well as writing of the results and provides feedback to researchers on each of these. This feedback not only will be beneficial in self-evaluation of the researcher’s approach, but also will provide the researcher the chance to assess the effects of this approach. Furthermore, the experts may contribute to improvements in the overall quality of the study by making proposals on the various stages of research (Yıldırım and Şimşek, 2005).

The content validity of the study directly is related to the effectiveness of the six items in accomplishing the objectives of this study. The themes derive from the insights of two groups of experts, one group involving educators who deliver graduate courses in research methods. The writing activities in the workbooks are analyzed according to these themes, and the data are categorized by these themes. The frequencies and percentages of data also are represented.

The data collected in the study have been interpreted according to following research questions:

In the workbook of the related grade level:

1. What is the number (n) of

i. Sentence level writing activities,
ii. Paragraph level writing activities,
iii. Text level writing activities,

and their frequencies (%) in all activities when compared to the other writing activities?

2. What is the number (n) of writing activities for spelling and punctuation and their ratio (%) to the other writing activities?

3. What is the number (n) of writing activities that could not be categorized based on their instructions and their ratio (%) to the other writing activities?

4. What is the number (n) of each text type in text based writing activities and their ratio (%) to all text based writing activities?

Coding and analysis of the data

In the initial stage of the study, four workbooks of the Turkish language course were studied in order to construct the “sub-themes” of the themes stated in the content analysis instructions. For instance, for the question, “What is the number (n) of writing activities for spelling and punctuation and their ratio (%) to the other writing activities?”, the following twenty-seven sub-themes were determined (activities involving full stop, the comma, the semi colon, the question mark, the exclamation point, the dash, the colon, parentheses, brackets, the hyphen (-), the back slash, ellipses, the dash, capitalization, separate and adjacent “-dE” and “-kİ”, question suffixes, numbers, abbreviations, mis-spelled words, etc). Later, these four workbooks were reinterpreted based on this categorization, and each entry was individually coded into “sub-theme”.

The coding in this study was conducted by the researcher at two different times, and there is no mismatch between the two codings. Therefore, this study’s reliability is assured. In the following procedure, the occurrence of related theme/sub-theme in the workbook of the course was checked (exist or not-exist) and numbers (n) and frequencies (%) were calculated. All data are presented in tables.

FINDINGS

Sentence-level writing activities published by MONE for 5, 6, 7 and 8th grade Turkish language course workbooks

Table 1 portrays the distribution of sentence-level writing activities according to grade level. According to the table, there are fifty sentence-level writing activities in the 5th grade student workbook, and the percentage of these activities in all writing activities at this grade level is 37.31%. This figure is forty-one in the 6th grade, and the percentage is 33.88%. Meanwhile, the number of activities in the 7th grade is thirty-seven, with their percentage being 30.57%. Finally, there are twenty-five activities in the 8^{t}h grade with a percentage of 28.73%. Sentence-level writing activities are employed most frequently in the 5th grade, and the number tends to decrease as the level increases. The lowest number of activities exists in the 8th grade workbook.

Paragraph-level writing activities published by MONE for 5, 6, 7 and 8th grade Turkish language course workbooks

The distribution of paragraph-level writing activities according to grade level is presented in Table 2. In the 5th grade, there are 11 activities, with their percentage in all 5th grade writing activities being 8.20%. There are five writing activities in the 6th grade, with their percentage being 4.13 %. The ratio of nine activities to the total number of writing activities in the 7th grade is 7.43 %. Moreover, the ratio of six activities to the total number of writing activities in the 8th grade is 6.89 %. While the number of paragraph-level writing activities is highest in the 6th grade, it is lowest in the 8th grade. The number of these activities is higher in the 6th grade in comparison to those in the 7th grade.

Text level writing activities published by MONE for 5, 6, 7 and 8th grade Turkish language course workbooks

Table 3 summarizes the data regarding the number and ratio of text-level writing activities to the total number of

Table 1. Distribution of sentence-level writing activities according to grade level.

Grade level of student workbook	Number of sentence-level writing activities	Ratio to other writing activities (%)
Grade 5	50	37.31
Grade 6	41	33.88
Grade 7	37	30.57
Grade 8	25	28.73

Table 2. Distribution of paragraph-level writing activities according to grade level.

Grade level of student workbook	Number of paragraph-level writing activities	Ratio to other writing activities (%)
Grade 5	11	8.20
Grade 6	5	4.13
Grade 7	9	7.43
Grade 8	6	6.89

Table 3. Distribution of text-level writing activities according to grade level.

Grade level of student workbook	Number of text-level writing activities	Ratio to other writing activities (%)
Grade 5	29	21.64
Grade 6	21	17.35
Grade 7	25	20.66
Grade 8	26	29.88

writing activities. The table shows that there are twenty-nine activities in the 5th grade, and the ratio to writing activities is 21.64 %. The ratio of twenty-one activities to the total number of writing activities in the 6th grade is 17.35 %. While the ratio of twenty-five activities in the 7th grade is 20.66 %, the ratio of twenty-six activities in the 8th grade is 29.88%. The number of paragraph-level writing activities is highest in the 8th grade and lowest in the 6th grade. The highest ratio of 29.88% in the 8th grade indicates the progressive development of writing skill. However, the lowest number, supposed to exist in the 5th grade, exists instead in the 6th grade at 17.35%.

Spelling and punctuation related writing activities published by MONE for 5, 6, 7 and 8th grade Turkish language course workbooks

Table 4 illustrates the number of spelling and punctuation related activities in each grade and their percentages in writing activities. According to this table, one activity in grade 5 consists of 0.74% of writing activities in this level. Similarly, there are thirty-one activities in grade 6 with a 25.62% ratio to other activities. While the ratio of twenty-eight activities to the total number of writing activities in the 7th grade is 23.14 %, the ratio of nine activities in the 8th grade is 10.34%. Therefore, the number of activities related to spelling and punctuation is the highest in the 5th grade and the lowest in the 6th grade.

Writing activities which could not be categorized based on their instructions, published by MONE for 5, 6, 7 and 8th grade Turkish language course workbooks

Table 5 records the number of activities, which could not be categorized, based on their instructions as well as their percentages in writing activities. One activity requires that students “please write about Atatürk’s love for his country, nation and human beings based on the anecdote (they have) listened to.” (Arhan et. al., 2014). Based on this instruction, students could write an essay, article, short story, or anecdote. According to the table, there are forty-three activities in the 5th grade, and their percentage in all writing activities is 39.44%. In Grade 6, there are twenty-three activities in this category and the percentage is 21.10%. While there are twenty-two activities in grade 7 with a 20.18% ratio, there is a similar number in Grade 8, with twenty-one activities and a

Table 4. Distribution of spelling- and punctuation-related activities according to grade level.

Grade level of student workbook	Number of spelling- and punctuation-related activities	Ratio to other writing activities (%)
Grade 5	1	0.74
Grade 6	31	25.62
Grade 7	28	23.14
Grade 8	9	10.34

Table 5. Writing activities which could not be categorized based on their instructions, published by mone for 5, 6, 7 and 8 grade Turkish language course workbooks.

Grade level of student workbook	Number of activities which could not be categorized based on their instructions	Ratio to other writing activities (%)
Grade 5	43	39.44
Grade 6	23	21.10
Grade 7	22	20.18
Grade 8	21	19.3

19.3% ratio.

Writing activities according to text type, published by MONE for 5, 6^{t}, 7 and 8th grade Turkish language course workbooks

Table 6 summarizes the numbers of text types which students are required to construct in writing activities as well as their ratio to the total number of text-level writing activities. There are twenty-nine activities in the 5th grade workbooks, and among these activities, there is only one occurrence of memoir, legend, travel writing, journal entry, and theatre genres. The ratio of these to all text-level writing activities is 3.45%. The ratio of seven activities in story- writing is 24.14%. There are three activities in letter-writing with a 20.69% ratio. The number of activities whose text types are not stated in the instructions is eight, with a 27.59% ratio.

In the 6th grade, one activity in each of the categories of biography, news article, and poetry comprises 4.76% of all activities observed at this grade level. In each of the essay and story categories, there are three activities with a 14.29% ratio. There are two letter-writing activities, with the ratio being 9.52%. Finally, there are ten activities without any stated text type, whose percentage in all writing activities is 47.62.

One activity in each of the categories of anecdote, travel writing, journal entry, tale, letter, and poetry comprises 4% of all activities observed in the 7th grade. The percentage of the three activities in essay type is 12. In short story type, ten activities have a 40% ratio. Finally, six activities without any stated text type have a ratio of 24%. The analysis of 8th grade workbooks reveals one activity for each of the categories of biography, legend, essay and poetry, with a 3.85% ratio. In criticism and interview, there are two activities, and they comprise 7.69% of the activities. Four narrative activities comprise 15.38% of all activities. There are seven activities without any stated text type, which comprise 26.92% of all writing activities.

In conclusion, there are eight writing activity types observed in the 5th grade, six in the 6th grade, eight in the 7th grade, and eight in the 8th grade. When variety is considered, the least number of writing types is expected in the 5th grade workbook, and the highest number of activity is expected in the 8th grade book. However, the data in the table indicates that the least variety was observed in the 6th grade (n=6).

DISCUSSION AND CONLUSION

Some inferences can be made based on the data of this study. A positive aspect of the workbooks is the inclusion of writing activities from all three progressive-writing levels (sentence, paragraph and text). The use of writing activities at each of these three levels provides students with the opportunity not only to improve their writing skills of lower levels, but also to develop higher level writing skills. One important detail to note is the level of compliance of the activity with students' level in terms of the number and quality of the activities. Along with this compliance, characteristics of the writing activity expected from students should be stated as concretely as possible.

Table 6. Distribution of text types in writing activities according to grade level.

Text types	5 grade writing work book	Percentage in text- level writing activities (%)	6 grade writing work book	Percentage in text level writing activities (%)	7 grade writing work book	Percentage in text level writing activities (%)	8 grade writing work book	Percentage in text level writing activities (%)
Memoir	1	3.45	-	-	-	-	-	-
Biography	-	-	1	4.76	-	-	1	3.85
Essay	-	-	3	14.29	3	12	7	26.92
Legend	1	3.45	-	-	-	-	1	3.85
Critic	-	-	-	-	-	-	2	7.69
Anecdote	-	-	-	-	1	4	-	-
Travel writing	1	3.45	-	-	1	4	-	-
Journal	1	3.45	-	-	1	4	-	-
News article	-	-	1	4.76	-	-	-	-
Story	7	24.14	3	14.29	10	40	4	15.38
Article	-	-	-	-	-	-	1	3.85
Tale	-	-	-	-	1	4	-	-
Letter	3	10.34	2	9.52	1	4	-	-
Interview	-	-	-	-	-	-	2	7.69
Poetry	6	20.69	1	4.76	1	4	1	3.85
Theatre	1	3.45	-	-	-	-	-	-
Others	8	27.59	10	47.62	6	24	7	26.92
Total	29	100	21	100	25	100	26	100

There are certain writing activities in the workbooks which could not be classified based on their instructions. The students cannot clearly understand what kinds of texts they are expected to write; therefore, these activities do not successfully serve their purpose. Moreover, this situation prevents the establishment of the text concept in students' minds. Students tend to write the type with which they are familiar and, thus, feel comfortable when writing. As a result, their development of skills for composing other types of texts is impeded.

The first finding of this study regards sentence-Level writing activities. One scholar defines sentence in the following way:

"*A sentence is a string of words to utterly express feelings, thoughts, and a wish. Sentences are the fundamental elements of understanding and expression as they state complete ideas which are the basic units of thinking*" (Güneş, 2003).

Elaborating upon to this understanding, Tansel (1985) asserts that "the purpose of written expression is to express a topic and thoughts about the topic as a whole by arranging sentences and paragraphs". In line with this easy-to-difficult principle of written expression, sentence-level writing activities occur most frequently in grade 5 (n=50), and the number of these activities decrease and the grade level increases (n=41, n=37, n=25).

The second finding of this study pertains to paragraph-level writing activities. In prose, a paragraph is a collection of sentences that develops, in a coherent manner, an aspect of an extensive topic. As a result, a student who successfully acquires sentence-level writing ability should not continue to practice text-level writing without first mastering paragraph-level writing skills. Otherwise, certain negative results might occur; for instance, the student might fail to

sequence thoughts in a logical order, to distinguish necessary information from unnecessary information, and, ultimately, to establish coherent texts. In order to ensure coherence in a paragraph, the student should have knowledge of certain writing elements including topics, perspective, the main idea, and supporting sentences (Tok, 2014). These features enable paragraphs to function as bridges between texts and sentences. Proficiency in paragraph-level writing skills can be interpreted as the outcomes of sentence-level writing skills and prerequisites of text-level writing skills. Therefore, all students should receive paragraph-level writing instruction (Coşkun, 2011).

Despite the importance of this principle of progression in writing development, the number and percentage of paragraph-level activities in Turkish language workbooks did not exhibit a decreasing pattern as was the case in sentence-level writing activities. When the textual standards, teaching principles, and features of writing ability are considered, paragraph- level writing activities are expected to decline towards the 8th grade. due to a shift in emphasis from paragraph- to text-level activities.

The third finding of the study involves text-level writing activities. According to Çeçen (2011), a text is “a structure composed for an emotional or intellectual purpose with a certain meaning and form unity”. The ultimate aim in writing instruction is to enable students to construct texts successfully. In order to have text level writing skills, an individual needs to have mastered the objectives of both sentence- and paragraph-level writing instruction, and this is possible only with progressive instruction. Just as sentence-level writing activities are emphasized in lower grades, the quantity and percentage of text-level writing activities should increase along with grade level. Although the percentage of the grade 8 text-level writing activities is higher when compared to other grade levels, the numbers and percentages of text-level writing activities in the 5, 6 and 7th grades are not entirely congruent with the principles of progressive writing.

The fourth finding in this study regards the number of writing activities for spelling and punctuation in Turkish language course workbooks as well as their percentage in all activities of the given grade. According to Özbay (2011), the acquisition of spelling skills is especially important because the standard language easily is affected by the spoken language, that is, dialect. punctuation, on the other hand, plays an important role in written expression and reading. An important reason underlying spelling and punctuation instruction is to aid students in facilitating better understandings of texts. Özbay also conducted a study pertaining the use of punctuation marks and revealed that the students in his study lacked the required capacity to apply correctly their punctuation knowledge.

The knowledge of spelling rules and punctuation usage is highly important for the development of cognitive and expressive capabilities. Therefore, they should be included in the objectives of writing instruction. Although related objectives are included in the Turkish language curriculum, spelling and punctuation are not adequately incorporated by the student workbooks. Especially in 5th grade workbooks, there is almost no example of spelling and punctuation activities. The situation is similar in the 8th grade books. Spelling and punctuation seem to be reserved for the 6th and 7th grade books. Another detected issue is the disconnect between objectives involving spelling and punctuation and their actual applications (inclusion in activities). The number and percentage of such activities are expected to increase in these books alongside grade level.

The fifth finding of the study regards the number of writing activities could not be categorized based on their instructions as well as their ratio to other writing activities of the given level. In written expression activities, the text type should be stated clearly so that students may easily determine the text type and construct a plan of the written text. This is because the most important factor in determining the text plan is the text type. Furthermore, students tend to develop negative attitudes towards writing activities whose topics and text types are not stated (Karatay, 2011).

The sixth finding of this study regards the number of each text type in text-based writing activities and their ratio to all text-based writing activities in the Turkish language course workbook. The principles of progressive writing were not considered in determining the text types of writing activities given to students. For instance, journal entry activities are expected to typify books from lower grades in order to facilitate students’ development of writing habit. The difficulty level of keeping a journal is appropriate for developing writing habit from early ages. However, there were no journal entry writing activities in the 6th grade book. In the 5th grade book, there was only one journal activity. Contrary to this situation, theatre activities were present in the 5th grade books but not in any other grade levels. In order for the writing instruction to achieve the determined objectives, the text types and number of activities should be appropriate to the grade level of students.

Conflict of Interests

The author have not declared any conflict of interests.

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Investigation of social studies teachers' intended uses of social networks in terms of various variables

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The aim of this research is to determine Social Studies teacher candidates' intended uses of social networks in terms of various variables. The research was carried out by using screening model of quantitative research methods. In the study, "The Social Network Intended Use Scale" was used as a data collection tool. As a result of the research, it was observed that students used social networks mostly for research, maintaining communication and communicating and following these, they used social networks for collaboration, entertainment, content sharing and starting communication. In the sub-dimensions of cooperation, starting communication and content sharing of students' intended uses of the social network, a significant difference in favor of male students was observed. It was observed that there was a significant difference only in the dimensions of entertainment from students' intended uses of a social network according to grade level. When analyzing the sub-dimensions of cooperation, starting communication, communicating and entertainment in terms of frequency of students' internet use, it was observed that there was a significant difference between groups in favor of students who used the internet more often. In the sub-dimensions of cooperation, starting communication, content sharing, and entertainment in terms of the frequency of social network use of the students who participated in the research, a significant difference was observed in favor of the students who used social network more often. Also, it was observed that the students who connected to the internet via mobile connections used social networks more in the sub-dimensions of collaboration, maintaining communication and content sharing.

Key words: Social network, teacher candidate, social studies.

INTRODUCTION

Communication instruments changing in parallel with the development of science and technology are constantly being renewed; the social media which makes it easier to reach the masses comes into prominence in our age in which computer and internet technologies are rapidly spreading. Today, the social media that have become a meeting and organizing tool in preparing the ground for many social phenomena which has become the starting point for people who have gathered around the same thoughts.

Knowledge communities generated by information technologies can interact with each other independently

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from time and space. In this way, people live in a digital environment where remote places become closer, and where knowledge generation and sharing are redefined, the role of science and technology in the relevant experiences is changing at any moment. Consequently, it is observed that a speed revolution is being experienced at the level causing to forget its beginning (Odabaşı et al., 2012). Communication, technology and media have undergone quite a great change during the time elapsed since the Persian Empire had initiated the postal service in 550 BC. In the last 15 years, communication has completely changed its shape and taken a digital and massive form. In addition to being massive, the fact that communication brings internal interacting chains with it forms the basis of social networks (Büyükşener, 2009).

Today, one of the most common intended uses of the internet is to communicate via social networking sites and make sharing. Social networking sites are now wide communications networks used by millions of people. Social networking sites are member-based communities allowing their users to edit profile information such as username, password, and photos, to send public or private online messages and to communicate by sharing sound, photographs, video, etc. (Pempek et al., 2009; Barış and Tosun, 2013). Social networking sites are web-based systems allowing users to create fully or semi-open individual profile pages, to express themselves to those with links to social networks, and to have a talk with these people (Body and Ellison, 2007). Social networking services are online services that reflect the relationships of people with common interests and which allow them to communicate. Via these services, people can maintain their existing relationships in real life, and at the same time, they can make contact with people with common interests (İşman, 1998).

In this context, the aim of this study is to determine the purposes of using social networks that are used very widely for the last years by prospective teachers. And accordingly, the answer to the question, whether the purposes of prospective teachers to use social networks vary according to gender, the frequency of using the ınternet, the frequency of using social networks and the way to access social networks, has also been sought.

METHODOLOGY

The study was carried out by using screening model of quantitative research methods. Screening model is a research approach that aims to describe a situation that is in the past or is existing as it is. In the screening model, the event, person or object that is subject to research is tried to be described as it is in its conditions, and no effort is made to change or affect them in any way (Karasar, 2007). "The Social Network Intended Use Scale" developed by Usluel et al. (2014) was used as a data collection tool within the scope of the research. The reliability coefficient of 26 items used in the scale that was calculated with Cronbach's alpha was found to be 0.92. The scale was composed of a total of 7 sub-dimensions including research, collaboration, starting communication, communication, maintaining communication, content sharing and entertainment.

The population of the research was composed of social studies teacher candidates studying at the Faculty of Education in Adıyaman University. The sample of the research was composed of a total of 183 students consisting of the 2nd, 3rd and 4th grade students who study in social studies teacher department at the same faculty in the academic year 2014 to 2015. The demographic information of the students who participated in the research is given in Table 1.

Analysis of the data

Statistical package for the social sciences (SPSS) 21 packaged software was used in the analysis of the data. In the analysis phase, frequency, average, t-test in independent groups, ANOVA test and Scheffe test to determine significantly different groups were used.

FINDINGS

Findings related to the social studies teacher candidates' intended uses of social network

Findings related to the frequency and percentage calculations of intended uses of the social network of the students who participated in the research are given in Table 2. When looking at Table 2, it was observed that students who participated in the research used social networks "to search for information about an issue that they wonder or they care" at the most ($\overline{X}$ =4.22) in the sub-dimension of "research" among the intended uses of social network, and they used it "to find solutions to any problem" ($\overline{X}$ =3,77) at the least.

In the sub-dimension of cooperation, it was observed that they used it "to be informed about events" at the most ($\overline{X}$ =4,19), and they used it "to organize socio-cultural events" at the least ($\overline{X}$ =3,18). In the sub-dimension of starting communication, it was observed that they used it "to make new friends" at the most ($\overline{X}$ = 2,85), and they used it "to communicate with friends with whom they are not intimate" at the least ($\overline{X}$ = 2.27). In the sub-dimension of communicating, it was observed that they used it "to exchange messages with their friends" at the most ($\overline{X}$ =3,98), and they used it "to chat with friends (instant communication, voice and video communication)" at the least ($\overline{X}$ = 3,38). In the sub-dimension of maintaining communication, it was observed that they used it "to continue the communication with the friends" at the most ($\overline{X}$ =4.07), and they used it "reach my friends whose contact details are not known" at the least ($\overline{X}$ =3,51).

In the sub-dimension of content sharing, it was observed that they used it "to share images (pictures and videos and so on.) created to support their views" at the most ($\overline{X}$ = 3.77), and they used it "to create a personal activity log" at the least ($\overline{X}$ = 2.49). In the sub-dimension

Table 1. Demographic information of the students.

Variable		Frequency (F)	Percentage (%)
Gender	Female	73	39.9
	Male	110	60.1
Grade	2nd grade	61	33.3
	3rd grade	50	27.3
	4th grade	72	39.3
Frequency of the internet use	0-3 h	54	29.5
	3-6 h	45	24.6
	6-9 h	22	12.0
	9+ h	62	33.9
Frequency of social network use	0-3 h	62	33.9
	3-6 h	44	24.0
	6-9 h	29	15.8
	9+ h	48	26.2
Social network access	Wired connection	40	21.97
	Mobile connection	142	78.02

of entertainment, it was observed that they used it "to look at funny sharings (word and cartoons, etc.)" at the most ($\overline{X}$ =3.63), and they used it "to get rid of factors that make them unhappy when they feel unhappy" at the least ($\overline{X}$ =3,19).

When analyzing the students' intended uses of social networks in total, it was observed that they used it for research ($\overline{X}$ =3.99), maintaining communication ($\overline{X}$ =3.81) and communicating ($\overline{X}$ =3.68) at the most. The other intended uses were cooperation ($\overline{X}$ = 3.58), entertainment ($\overline{X}$ = 3.35), content sharing ($\overline{X}$ = 3.10) and starting communication ($\overline{X}$ = 2.53) respectively.

Findings related to social studies teacher candidates' intended uses of social network according to the variable of gender

Findings related to the t-test results of intended uses of the social network of the students participated in the research according to the variable of gender are given in Table 3. When analyzing Table 3, it was observed that there was a significant difference in favor of male students in the sub-dimensions of cooperation (t=.811; p= .039<.05), starting communication (t= -3,512; p= .001<.05) and content sharing (t=-2.01, p= .046<.05) of the intended use of social networks of the students participated in the research. It was observed that there was no significant difference in the sub-dimensions of research, communicating, maintaining communication and entertainment between genders.

Findings related to social studies teacher candidates' intended uses of social network according to the variable of grade

Findings related to ANOVA test results of intended uses of the social network of the students participated in the research according to the variable of class-grade are given in Table 4. According to ANOVA test result when analyzing Table 4, a significant difference (F=3.47; p= .033) was observed only in the sub-dimension of entertainment according to the grade of the students' intended uses of the social network. Using the Dunnett-C test that was carried out to determine the difference between multiple comparisons, it was observed that there was a significant difference between the 2nd and 4th grades.

Findings related to social studies teacher candidates' intended uses of social network according to the frequency of the internet use

Findings related to ANOVA test results of intended uses of the social network of the students participated in the research according to the frequency of the internet use are given in Table 5. When analyzing Table 5, it was observed that there was a significant difference in favor of students who used the internet more often between groups in the sub-dimensions of cooperation (F=6.107, p= .001), starting communication (F=5.78, p= .001), communicating (F=4.78, p=.003) and entertainment

Table 2. Distribution of the intended uses of social network of the students who participated in the research.

Variable	Strongly disagree		Disagree		Undecided		Agree		Completely agree		X	ss.
Research	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**		
Use social networks to find solutions to any problem.	11	6.0	22	12	13	7.1	88	48.1	49	26.8	3.77	1.14
I use social networks to search for information about an issue that I wonder or care.	3	1.6	9	4.9	6	3.3	91	49.7	74	40.4	4.22	0.85
I use social networks to find materials to support my views (photos, video and text and so on)	7	3.8	13	7.1	17	9.3	83	45.4	62	33.9	3.98	1.03
	-	-	-	-	-	-	-	-	-	-	3.99	-
Cooperation	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**X**	**ss.**
I use social networks to collaborate with my friends about any issue or situation	7	3.8	25	13.7	12	6.6	76	41.5	63	34.4	3.89	1.13
I use social networks to get together with people who have common interests	14	7.7	25	13.7	23	12.6	76	41.5	45	24.6	3.61	1.21
I use social networks for task sharing for a particular purpose	13	7.1	34	18.6	35	19.1	70	38.3	31	16.9	3.39	1.17
I use social networks to organize socio-cultural events	17	9.3	40	21.9	42	23	60	32.8	24	13.1	3.18	1.18
I use social networks to create a common purpose	20	10.9	35	19.1	35	19.1	68	37.2	25	13.7	3.23	1.22
I use social networks to be informed about events	7	3.8	8	4.4	12	6.6	71	38.8	85	46.4	4.19	1.00
	-	-	-	-	-	-	-	-	-	-	3.58	-
Starting communication	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**X**	**ss.**
I use social networks to make new friends.	34	18.6	58	31.7	21	11.5	41	22.4	29	15.8	2.85	1.38
I use social networks to tell my friends something that I cannot say them face to face.	55	30.1	55	30.1	23	12.6	28	15.3	22	12	2.49	1.38
I use social networks to communicate with friends with whom I'm not intimate	68	37.2	55	30.1	18	9.8	25	13.7	17	9.3	2.27	1.33
	-	-	-	-	-	-	-	-	-	-	2.53	-
Communicate	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**X**	**ss.**
I use social networks to chat with friends (instant communication, voice and video communication)	17	9.3	17	9.3	8	4.4	80	43.7	61	33.3	3.38	1.25
I use social networks to exchange messages with my friends	11	6	17	9.3	6	3.3	79	43.2	70	38.3	3.98	1.15
	-	-	-	-	-	-	-	-	-	-	3.68	-
Maintaining the communication	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**X**	**ss.**
I use social networks to reach my friends whose contact details are not known	23	12.6	25	13.7	16	8.7	73	39.9	46	25.1	3.51	1.33
I use social networks to find my old friends	13	7.1	21	11.5	7	3.8	75	41	67	36.6	3.88	1.22
I use social networks to continue the communication with my friends	8	4.4	14	7.7	8	4.4	80	43.7	73	39.9	4.07	1.06
I use social networks in order not to lose my contact with my friends	19	10.4	11	6	17	9.3	77	42.1	59	32.2	3.79	1.24
	-	-	-	-	-	-	-	-	-	-	3.81	-

Table 2. Cont'd

Content sharing	f	%	f	%	f	%	f	%	f	%	X	ss.
I use social networks to create content (pictures, videos and text, etc.) about any topic	7	3.8	23	12.6	23	12.6	84	45.9	46	25.1	3.75	1.08
I use social networks to share my images (pictures and videos and so on.) that I create to support my views	10	5.5	21	11.5	23	12.6	76	41.5	53	29	3.77	1.14
I use social networks to create photo albums	38	20.8	37	20.2	29	15.8	55	30.1	24	13.1	2.94	1.36
I use social networks to create video albums	45	24.6	58	31.7	28	15.3	36	19.7	16	8.7	2.56	1.29
I use social networks to create a personal activity log	51	27.9	47	25.7	41	22.4	32	17.5	12	6.6	2.49	1.24
	-	-	-	-	-	-	-	-	-	-	3.10	-
Entertainment	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**X**	**ss.**
I use social networks to look at funny sharings (word and cartoons etc.)	19	10,4	18	9,8	21	11,5	77	42,1	48	26,2	3,63	1,25
I use social networks to get rid of factors which make me unhappy when I feel unhappy	32	17,5	30	16,4	30	16,4	53	29	38	20,8	3,19	1,39
I use social networks to make funny shares (like words and cartoons)	33	18	30	16,4	19	10,4	63	34,4	38	20,8	3,23	1,41
	-	-	-	-	-	-	-	-	-	-	3.35	-

ss: standard deviation; x: average.

(F= 3.33, p= .021) in terms of the frequency of the Internet use.

Findings related to social studies teacher candidates' intended uses of social network according to the frequency of social network use

Findings related to ANOVA test results of intended uses of the social network of the students participated in the research according to the frequency of social network use are given in Table 6. When analyzing Table 6, it was observed that there was a significant difference in the sub-dimensions of cooperation (F= 6.90, t=.000), starting communication (F=4.74, t=.003), content sharing (F= 4.06, t= .008) and entertainment (F= 4.99, t= .002) of the intended use of the social network of the students who participated in the research in terms of the frequency of social network use according to ANOVA test results. As a result of the Scheffe test, it was observed that the difference was in favor of the students who used the social networks more often.

Findings related to social studies teacher candidates' intended uses of social network according to the ways of accessing social networks

T-test results of intended uses of the social network of the students who participated in the research according to the ways of accessing social networks are given in Table 7. When analyzing the t-test results of the ways of accessing the social network of the students who participated in the research in Table 7, a significant difference was observed in favor of students who connected to social networks via mobile device in the sub-dimensions of cooperation (t= -4.679, p= .000), maintaining communication (t= -2.505, p= .013) and content sharing (-2.250, p= .026).

DISCUSSION

When analyzing the findings obtained as a result of the research, it was observed that the weekly average students' frequency of the internet use are: 29.5% of them used it for 0 to 3 h, 24.6% of them for 3 to 6 h, 12% of them for 6 to 9 h and 33.9% of them for 9+ h. In the research carried out by Vural and Bat (2010), it was observed that 67.4% of the students used the internet every day.

Table 3. T-test results of intended uses of social network of the students according to the variable of gender.

Intended use of social network	Gender	n	$\overline{X}$	Ss.	t	p
Research	Female Male	73 110	4.12 3.92	0.888 0.801	1.64	0.101
Cooperation	Female Male	73 110	3.43 3.69	0.832 0.792	0.811	0.039
Starting communication	Female Male	73 110	2.21 2.76	1.03 1.06	-3.512	0.001
Communicating	Female Male	73 110	3.76 4	1.23 0.904	-1.421	.0158
Maintaining communication	Female Male	73 110	3.72 3.88	1.01 0.930	-1.099	0.274
Content sharing	Female Male	73 110	2.95 3.21	0.843 0.899	-2.01	0.046
Entertainment	Female Male	73 110	3.25 3.43	1.15 1.04	-1.09	0.274

Table 4. ANOVA test results of intended uses of social network of the students according to the variable of grade.

Intended use of social network		Sum of squares	df	Squares average	F	p	Significant difference
Research	Intra groups Inter groups	2.07 126.48	2 180	1.03 0.703	1.47	0.232	-
Cooperation	Intra groups Inter groups	2.48 118.67	2 180	1.24 0.659	1.88	0.155	-
Starting communication	Intra groups Inter groups	4.00 210.32	2 180	2.00 1.16	1.71	0.183	-
Communicating	Intra groups Inter groups	3.02 199.05	2 180	1.51 1.10	1.36	0.257	-
Maintaining communication	Intra groups Inter groups	2.45 166.79	2 180	1.22 0.92	1.32	0.269	-
Content sharing	Intra groups Inter groups	2.27 140.02	2 180	1.13 0.778	1.46	0.234	-
Entertainment	Intra groups Inter groups	8.06 208.96	2 180	4.03 1.16	3.47	0.033	2-4

(2: 2nd grade, 3: 3rd grade and 4: 4th grade).

Table 5. ANOVA test results of intended uses of social network of the students according to the frequency of the internet use.

Intended use of social network		Sum of squares	df	Squares average	F	p	Significant difference
Research	Intra groups	2.06	3	0.688	0.974	0.406	-
	Inter groups	126.49	179	0.707			
Cooperation	Intra groups	11.24	3	3.75	6.107	0.001	4-1,2-1
	Inter groups	109.90	179	0.614			
Starting communication	Intra groups	18.95	3	6.31	5.78	0.001	4-1
	Inter groups	195.38	179	1.09			
Communicating	Intra groups	15.00	3	5.00	4.78	0.003	4-2, 4-1
	Inter groups	187.07	179	1.045			
Maintaining communication	Intra groups	6.45	3	2.15	2.36	0.073	-
	Inter groups	162.78	179	.909			
Content sharing	Intra groups	3.91	3	1.30	1.68	0.171	-
	Inter groups	138.38	179	0.773			
Entertainment	Intra groups	11.47	3	3.82	3.33	0.021	3-1
	Inter groups	217.02	179	1.14			

(1: 1-3 h, 2: 3-6 h, 3: 6-9 h, 4: 9+ h).

Table 6. ANOVA test results of intended uses of social network of the students according to the frequency of social network use.

Intended use of social network		Sum of squares	df	Squares average	F	p	Significant difference
Research	Intra groups	1.48	3	0.493	0.695	0.556	
	Inter groups	127.07	179	0.710			
Cooperation	Intra groups	12.56	3	4.18	6.90	0.000	3-1, 4-1
	Inter groups	108.59	179	0.607			
Starting communication	Intra groups	15.78	3	5.26	4.74	0.003	4-1
	Inter groups	198.54	179	1.10			
Communicating	Intra groups	9.39	3	3.13	2.91	0.036	
	Inter groups	192.68	179	1.07			
Maintaining communication	Intra groups	7.17	3	2.39	2.64	0.051	
	Inter groups	162.07	179	0.905			
Content sharing	Intra groups	9.07	3	3.02	4.06	0.008	4-1
	Inter groups	133.23	179	0.744			
Entertainment	Intra groups	16.75	3	5.58	4.99	0.002	4-1, 3-1
	Inter groups	200.27	179	1.11			

(1: 1-3 hours, 2: 3-6 hours, 3: 6-9 hours, 4: 9+ hours).

Table 7. T- test results of intended uses of the social network of the students according to the ways of accessing social network.

Intended use of social network	Gender	n	$\overline{X}$	Ss.	t	p
Research	Wired connection	40	3.94	0.788	-.449	0.654
	Mobile device	142	4.01	0.858		
Cooperation	Wired connection	40	2.98	0.994	-4.679	0.000
	Mobile device	142	3.76	0.670		
Starting communication	Wired connection	40	2.32	1.18	-1.409	0.161
	Mobile device	142	2.60	1.05		
Communicating	Wired connection	40	3.62	1.290	-1.611	0.113
	Mobile device	142	3.98	.971		
Maintaining communication	Wired connection	40	3.48	1.220	-2.505	0.013
	Mobile device	142	3.91	0.864		
Content sharing	Wired connection	40	2.82	0.900	-2.250	0.026
	Mobile device	142	3.18	0.864		
Entertainment	Wired connection	40	3.05	1.27	-1.76	0.084
	Mobile device	142	3.44	1.025		

This result matched up with the result of Household Information Technology Use Research carried out by TÜİK (2014).

According to these results, the ratio of computer use is 53.5%, and the ratio of the internet use is 53.8% among individuals in the age group of 16 to 74 in Turkey. Similarly, males' ratio of computer use is 62.7%; the Internet use is 63.5%. Among females, the ratio of computer use is 44.3%, the internet use is 44.1%. When analyzing the frequency of the social network use of the students who participated in the research, it was observed that 33.9% of them used it for 0 to 3 h, 24% of them used it for 3 to 6 h, 15.8% of them used it for 6 to 9 h, 26.2% of them used it for 9+ h. It can be said according to these results that university students frequently use social networking sites.

This finding is supported by the findings of the researches carried out by various researchers in the literature. In the research carried out by Öztürk and Akgün (2012), it was observed that the vast majority of the students used social networking sites at least once a week. When analyzing the results of Household Information Technology Use Research carried out by TÜİK (2014), 78.8% of individuals using the internet in Turkey in the first three months of 2014 stated that they used the internet to join social networking sites. 78.02% of the students who participated in the research connected to the internet via mobile connection and 21.97% of them connected to the internet via a wired connection. In the research carried out by Özbay (2015), it was observed that students connected to social networks via mobile devices at the ratio of 85%.

When analyzing the students' intended uses of the social network, research ($\overline{X}$ =3.99), maintaining communication ($\overline{X}$ =3.81) and communicating ($\overline{X}$ =3.68) were at the most, and then cooperation ($\overline{X}$ =3.58), entertainment ($\overline{X}$ =3.35), content sharing ($\overline{X}$ =3.10) and starting communication ($\overline{X}$ =2.53) respectively. When analyzing the students' intended uses of the social network, it was observed that they used it for the purpose of communicating at the most.\

However, they did not prefer to use it for the purpose of making new friends. When analyzing the literature, this result shows similarity with the studies carried out. In the research carried out by Erdem (2013), it was observed that social networks were used to maintain existing relationships rather than establishing new relations. In the research carried out by Karakoç and Avcı (2015), it was observed that the level of the use of social media for the purpose of establishing new friendships was low. Likewise, in the research carried out by Özbay (2015), it was observed that students used social networks to find

their old friends and communicate with them rather than to make new friends. In the research carried out by Karakuş and Varol (2012), it could be seen that students used social networks to find their old friends ($\overline{X}$ =4.0400) and to get in touch with them again. It was seen that the ratio of using social networks to find new friends (x=2.2533) was low.

In one of the results of the research, it was observed that students highly used social networks for the purpose of obtaining information, researching, entertainment and content sharing. When analyzing the literature, the findings obtained from the research show parallelism with the studies carried out. In the research carried out by Özbay (2015), it was observed that students preferred to use social networks to make entertainment content sharings. It could be said that the vast majority of them used the social networks to follow the developments in school and to be informed about social activities via these networks.

In the research carried out by Şener (2009), users stated that they used it, as the most important purpose of using Facebook in the first place, to communicate with their friends (66.2%), to find friends/acquaintances with whom they lost communication (37.7%) and to share videos/ photos they liked (20.6%). Again, 84.4% of users thought that "they made a group of friends different from the real life via Facebook." Facebook stands out as a site where acquaintances come together in daily life, rather than a dating site. In the research carried out by Vural and Bat (2010), among students who used social networks; 6.9% of them used them to find new friends, 2.8% of them used them to play interactive games, 0.3% of them used them to play non-interactive games, 18.5% of them used them to chat online, 9.7% of them used them to follow what their friends do, 13.2% of them used them to update the profile, 31.0% of them used them to spend time and 3.1% of them used them for other purposes. In the research carried out by Öztürk and Akgün (2012), it was observed that university students used social networking sites mostly to find their old friends (55.3%), join groups related to their universities(42.7%), communicate (81.6%), make sharing of a variety of information and resources (61.8%), be informed about the developments related to everyday life (58.9%) and follow the latest developments on the agenda (59.2%).

In one of the results of the research, it was observed that there was a significant difference in favor of male students in the sub-dimensions of cooperation, starting communication and content sharing in the students' intended uses of social networks, and there was not a significant difference between genders in the sub-dimensions of research, communicating, maintaining the communication and entertainment. In the research carried out by Ada et al. (2013), factors such as meeting the needs of information and reaching the detailed and comprehensive information mostly affected the female students' use of online social networking sites compared to male students. Moreover, female students were more motivated in the use of online social networking site by the factors such as communicating with other people, sharing information and maintaining social relationships. In the analysis of the intended use of social network according to gender in the research carried out by Akyazı and Ünal (2013), males used social networking sites for further recognition and for being recognized compared to females.

In the research carried out by Karakoç and Avcı (2015), it was observed that males used social media for content sharing (images, video, etc.) more than females, and there was a significant difference between them. In the research carried out by Filiz et al. (2014), while a significant difference in favor of males was observed in the sub-dimensions of "recognition and being recognized" of the students' intended use of social networks, no significant difference was observed between genders in the sub-dimensions of social interaction and communication and educational use.

In the one of the results of the research, it was observed that there was a significant difference (F=3.47; p= .033) only in the sub-dimension of entertainment of the students' intended uses of the social network according to their grade. Using the Dunnett-C test that was carried out to determine the difference between multiple comparisons, it was observed that there was a significant difference between the 2nd and 4th grades. In the research carried out by Filiz et al. (2014), significant differences were observed between the 4th grades and 1st grades and between the 3rd grades and 1st grades in the sub-dimension of "using for social interaction and communication" of the students' intended uses of social networks. According to the results of the research carried out by Sezgin et al. (2011), students' opinions about the educational use of Facebook varied statistically to a significant extent according to the grade levels in the dimension of "communication" and "cooperation".

In the one of the findings obtained from the result of the research, it was observed that there was a significant difference in favor of students who used the internet more often between the groups in the sub-dimensions of cooperation (F=6.107, p= .001), starting communication (F=5.78, p= .001), communicating (F=4.78, p=.003) and entertainment (F= 3.33, p= .021) in terms of frequency of the internet use. In terms of the frequency of social networking use of the students who participated in the research, a significant difference was observed in favor of the students who used social networks more often in the sub-dimensions of cooperation (F=6.90, t=.000), starting communication (F=4.74, t=.003), content sharing (F= 4.06, t=.008) and entertainment (F= 4.99, t= .002). Likewise, in the research carried out by Filiz et al. (2014), a significant difference was observed in favor of those

who used the internet more often in the dimensions of using for the purpose of social interaction and communication, recognition and being recognized and educational use. In the research carried out by Vural and Bat (2010), there was a strong relationship between the frequency of the internet use and social networking use.

In the one of the research findings, a significant difference was observed in favor of the students who connected to social networks through mobile devices in the sub-dimensions of cooperation (t= -4.679, p=.000), maintaining communication (t= -2.505, p= .013) and content sharing (-2.250, p= .026), in terms of students' ways of accessing the social network. In the research carried out by Akyazı and Ünal (2013), the use of social networks for social interaction and communication purposes varied in favor of those who connected via mobile devices, and this difference was high (t=4,60; p<0,001). Likewise, it was observed that those who connected to social networking sites via mobile devices used social networking sites mostly for the purposes of recognition and being recognized. In line with the widespread use of mobile devices with each passing day and the fact that these devices can constantly be connected to the Internet, it is predictable that the intended uses of social networks will vary with each passing day (Filiz et al., 2014).

CONCLUSION

As a result of the research, it was observed that students used social networks mostly for research, maintaining communication and communicating and following these, they used social networks for collaboration, entertainment, content sharing and starting communication. In the sub-dimensions of cooperation, starting communication and content sharing of students' intended uses of the social network, a significant difference in favor of male students was observed. It was observed that there was a significant difference only in the dimensions of entertainment from students' intended uses of a social network according to the grade level. When analyzing the sub-dimensions of cooperation, starting communication, communicating and entertainment in terms of the frequency of the students' Internet use, it was observed that there was a significant difference between groups in favor of the students who used the Internet more often. In the sub-dimensions of cooperation, starting communication, content sharing, and entertainment in terms of the frequency of social network use of the students who participated in the research, a significant difference was observed in favor of the students who used social network more often. Also, it was observed that the students who connected to the Internet via mobile connections used social networks more in the sub-dimensions of collaboration, maintaining communication and content sharing.

SUGGESTIONS

The following suggestions are offered as a result of the research.

1. Considering the high use ratio of social networks for communicating, social networks can be benefited on issues of exchange of information for the courses, interaction of student-student and student-teacher, exchange of homework, portfolio, etc.
2. It is seen that mobile devices are used more often in accessing social networks. In this regard, training materials supported by mobile devices can be used during courses.
3. By ensuring teacher candidates to use technology-assisted learning, e-learning, and social networks during their university education, they should be ensured to give an education that is more integrated with technology to their students when they become teachers.

Conflict of Interests

The author has not declared any conflicts of interest.

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Full Length Research Paper

Multidisciplinary meeting (MDM) can provide education and reinforcement of inter-professional development

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The introduction of a multidisciplinary meeting (MDM) was analysed through a retrospective empirical study. The question of using it as a valuable tool to reinforce inter-professional development was made. The data was collected from 60 forth year Chiropractic students, who were at the end of their education and who were practicing their discipline under supervision. They were chosen because they fulfilled the World Health Organisation's criteria, as they had formed their professional identity. Data was collected via two-stage feedback interviews and was analysed qualitatively. Kirkpatrick's hierarchy was then used. Findings were grouped in the hierarchy's categories and analysed in a quantitative manner. It was found that the majority of the interviewees' opinions supported the MDM as an educational tool and a number of them believed that cognitive learning was achieved, influencing their behaviour. They supported that it helped them understand other professionals. In addition, they transferred and applied knowledge and practices to their professional environment, improving their collaboration with other health-workers, potentially improving the quality of their service.

Key words: Multidisciplinary meeting, education, Kirkpatrick's Hierarchy, inter-disciplinary development.

INTRODUCTION

For a number of years, the World Health Organisation (WHO) is facing the problem of shortage of health workers throughout the world and the inability to meet the increased service demands. Their goal is to increase the expertise and productivity of the existing workforce. The way to achieve and develop this workforce is by using innovative methods of teaching. The main supported method was, and is, the inter-professional education and training, which is leading to further collaboration between health professionals by increasing the spirit of teamwork. This way, the service to the patients is improving (WHO, 1988, 1998, 2009, 2010; RCN, 2007).

When these ideas were studied, it was found that when the different groups are brought together the different professionals need to fulfil some criteria. They must be flexible, self-reflective, willing to take risks and to be ready to take the given opportunity to learn from each other. They must have already established professional identity and roles; they need to abandon stereotypes, to be able to admit that they know almost nothing, to have positive attitudes and equal status, to establish team leaders with open minds and diverse thinking, who are willing to supervise and educate such a multidisciplinary team and monitor them. Notwithstanding, the primary

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outcome of this team approach has been shown to be an improvement in service provided and patient care (Carpenter, 1995; Harden 1998; Larson et al., 1998; Wilson and Pirrie, 2000; Barr, 2003; Harris et al., 2003; Levison, 2003; RCN, 2007; CAIPE, 2007; Kane and Luz, 2009; Haas et al., 2009; Krimshtein et al., 2011). Furthermore, topics covered during inter-professional teaching have to be general to engage all participants (SCIE, 2007; Street et al., 2007; Haas et al., 2009).

In light of the benefits of inter-disciplinary learning, a programme of morning trauma meetings were initiated and developed at District Hospital in South Wales. The aim of these meetings was to educate and present contemporary orthopaedic concepts and best practice procedures to colleagues in the National Health Service (NHS) at this facility to harmonize approach to patient care for common orthopaedic conditions. This training was designed in the form of a group discussion for all doctors of the Orthopaedic Department where the treatment and the management of all acute admissions was presented and educational scenarios using the cases as stimulus were discussed and analysed further.

It was not designed by academics and mainly based on the intuition of the consultants who had followed the General Medical Council's (GMC) guidelines of a "Good Medical Practice", as it is stated that all doctors are expected to be educators (GMC, 2001). The programme's further development was based on the participants' reflection and feedback, again without academic input. Gradually the meeting became more multidisciplinary as allied health professionals and doctors from other medical disciplines started to participate and attend. This Multidisciplinary Meeting (MDM) became a focal point to discuss cases by different professionals with the ultimate goal to establish a consensus on the diagnosis and the optimization of the patients' treatment (Kane and Luz, 2009). These clinical meetings can be used either for the education of patients (Rosen et al., 1998; Wilson et al., 2007; Burton et al., 2009; Ortega-Solano et al., 2011) or the evaluation and treatment of patients (Cook et al., 1996; Howard et al., 1997; Wright et al., 2009; Palmer et al., 2010; Moss, 2010; Roffey et al., 2011); so somebody could say they are service meetings.

Literature suggests that even the clinically orientated MDM's which are designed for co-ordination of service delivery can be educational (Kane and Luz, 2011). Further suggestions support that discussion and exercise of those who participate in a MDM are the most appropriate tools that help the students' learning (Haas et al., 2009). In our case, the MDM started as educational and the discussed cases were used for this purpose, but overall the patients' care was also improved. The main question now is that with the development of the teaching in our department and the offer of the MDM as one of the teaching programmes to students of the Medical School and the Institute of Chiropractors, as well as the occasional Student Nurses, Medical Science and Physiotherapy Students, there is the need to find if the MDM is fulfilling the purpose as an educational meeting or not. The anecdotal feedback is promising and in favour, but is this the truth? The objective is to answer the following questions. Is the meeting, as other health professionals participate, fulfilling the idea of inter-professional development? Can they learn from each other, change behaviour and move their experiences to their practice? Can an MDM be educational?

The groups of students studied in literature are mainly of two categories; medical students and nurses (Cooper et al., 2001; Quinn and Hughes, 2007). Chiropractic students during their studies are practicing constantly their "art" and for the last two years are actively participating in treating patients in specialised chiropractic clinic, where private patients are paying for the service. This practice although is under supervision, helps them to develop their professional identity. Other health workers are developing this identity much later, after their graduation, due to the delayed communication with their patients. In the present situation, the groups of students of the allied professions in some stage after their graduation will potentially work in the NHS, except the Chiropractic students, who usually after graduation are working "in isolation", in the private sector; they are what could be suggested as allied health professionals who do not train themselves to work in a team.

METHODOLOGY

The aim of this is to establish if the MDM is a useful educational tool and reinforces the inter-professional development or is it only a part of patient management. In order to do this there is a need to explore if teaching follows the Kirkpatrick's hierarchy of learning. The areas of the hierarchy are reaction, learning, behaviour and result (Cooper et al., 2001; Swanwick, 2011). Following Kirkpatrick, these areas will be explored and expanded upon. The findings were collapsed back to these four common categories and were listed within them. Initially, open coding was used in the analysis of the transcripts and the field notes taken during feedback interviews and later during focus group interviews. Later these codes were simplified and connected with Kirkpatrick's hierarchy (Table 1). The study was subject of the University of South Wales Ethical Committee's approval.

This is a retrospective empirical study. The data is qualitatively analysed based on interpretivism. Initially, as the first stage of the study, the transcripts of feedback sessions given by the 60 fourth year Chiropractic students who rotated through their Orthopaedic placement were analysed. The choice of these groups of students was made because they had the experience of the MDM and also it is taken that have formed their professional identity, fulfilling the criteria that WHO and other researchers have suggested in their studies. The feedback interviews were performed at the end of every rotation, following verbal consent, by an independent reviewer of the undergraduate centre with the presence of the main tutor who was there for the potential clarification of the programme taking into consideration the possible suggestions of the students' opinion for the betterment of the teaching. He was not actively participating and was out of the students' sight so to avoid creating pressure on them (Burgess, 1989). The facilitator will have written constructed questions as a guide (Table 2), which initially will ask the group to initiate the discussion (Flick, 2009).

Following the initial analysis of these transcripts, themes were

Table 1. Kirkpatrick's hierarchy (Cooper et al., 2001; Swanwick, 2011).

Reaction
Review and evaluate the learning experience and the perceptions of the students of the different groups
Learning
Evaluate the cognition and the interaction of the different represented professions.
Review their skills and their stereotypical understanding
Team work
Behaviour
Constructive learning
Interaction
Application in profession
Results
Collaboration and transfer of it to professional environment

Table 2. Questions asked by the facilitator.

Open questions to the interviewees
What do you achieve from attending the MDM?
Does MDM advance your education?
Did it enhance your understanding?
What opportunities do you think the MDM offers in comparison with another educational programme?
Has it improved your level of confidence in clinical management?
How did you learn in respect of constructive feedback, reflection, reinforcement of knowledge?
Is it a comfortable learning environment?
How did the MDM influence your perception about other health workers?

created and the codes of them are identified in Figure 1 mapping. To increase the credibility of the study, independent tutors of the University interviewed two focus groups of students. In each of these groups, six students participated, these students were informed about the purpose of the study and consented to the recording of their views. Prior to the discussion, all students were given written consent to sign and also verbal consent was obtained prior to the interview commencing (Table 3). Information about the project was given and also read prior to the interviews of the focus groups (Table 4).

Feedback of the findings and results of the study was available to them should they feel the necessity to obtain this information. The sessions were recorded and transcripts were made. The same codes used in the first stage were applied in the second stage so to increase the validity of the study. Following this analysis, the themes were grouped and simplified based on the Kirkpatrick's hierarchy categories using selective coding. The correlation of the initial codes seeing in Figure 1 and the Kirkpatrick's hierarchy categories is seen in Figure 2. Finally through further simplification to the positive or negative opinion on the MDM performance was recorded (Burgess, 1989; Coffey and Atkinson, 1996; Bryman, 2008; Flick, 2009; Denzin and Lincoln, 2011).

If a new theory will arise it will support that the project will be an inductive study (Bryman, 2008; de Vaus, 2009). Despite that ontologically, the study is giving a relative understanding of the question and so no generalised theory can be produced as this is part of a positivistic approach to the research philosophy; still there will be a worthwhile result of a wider consensus which can result to a so called more general opinion. This can be the result of how the reality of the meeting can be explained as objective and how this understanding can be interpreted as reality (Williams and May, 1996).

In the first stage of the study, there was a research/collaborator relationship as the students were answering freely and they were influencing the discussion but in the second stage there was more of an informant/reporter relationship as the questions were based on the previous experience.

In the research - Collaborator relationship

"the interviewee is included in discussions up front about what information is being sought and what approaches to the topics might be most fruitful to the endeavour for both participants" (Atkinson et al., 2010).

and the

"interviewee influences the content and order of questions and topics covered" (Atkinson et al., 2010).

In the informants – Reporters relationship, the interviewer plays the role of the reporter and observes the interviewee (informant).

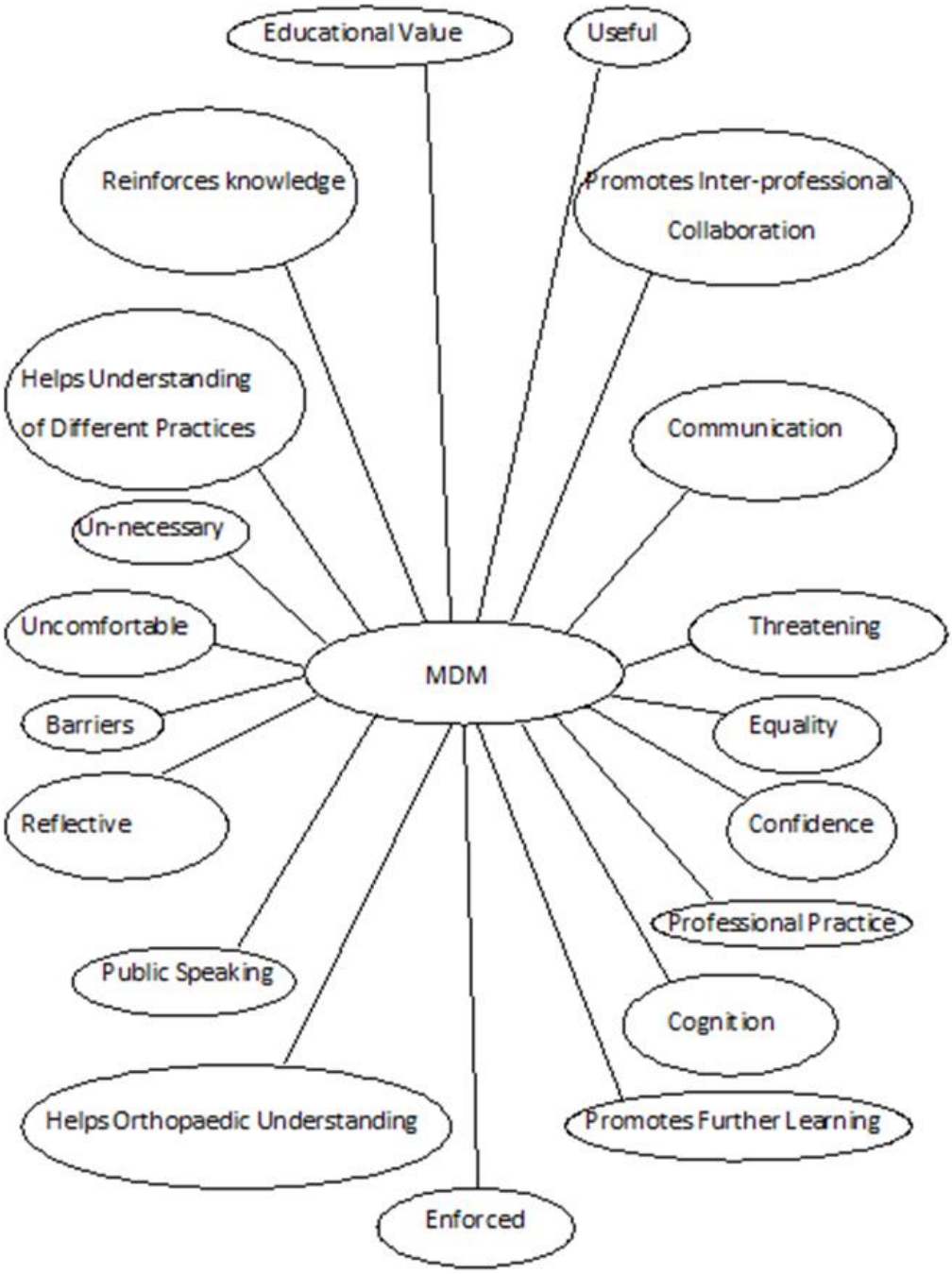

Figure 1. Initial analysis of transcripts.

"the reporter empowers the responder (now elevated to an "informant") by listening carefully and respectfully, allowing the informants to "name" the world in their own terms" (Atkinson et al., 2010).

Each interview lasted approximately one hour and was recorded, the tapes were transcribed and all notes were typed; all scripts were analysed by using the grounded analysis. Having the same themes between the two stages, the reliability could be increased if the repeatability will increase (Silverman, 2005; Bryman, 2008; Flick, 2009; Atkinson et al., 2010). The limitations are that the study is retrospective and also the presence of the tutor during the feedback interviews.

RESULTS

Following the analysis of the data, it was found that in the first stage there were a lot of students who believed that

Table 3. Interview consent form (2 copies required: 1 copy to participant, 1 copy to researcher).

Title of project: Multidisciplinary meeting (MDM) can provide education and reinforcement of inter-professional development
Name of researcher: Name of first author
I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have all these answered to my satisfaction
Please sign ----------
I give my consent to take part in the study and understand that I can withdraw from the research at any time without giving a reason
Please sign ----------
I confirm that the interview will be recorded. The recordings will be transferred to a written format and the tapes will be destroyed. The collected information will be kept for five years
Please sign ----------
I understand that direct quotes may be used in the final summary of the project but that my identity will remain confidential
Please sign ----------
Participant's name Date Signature
_____ _____ _____
Name of person who takes consent Date Signature
_____ _____ _____

Table 4. Information for the project.

Thank you for taking the time to participate in this study
The purpose of the study is to understand your views on the Multidisciplinary Meeting which is performed in the Orthopaedic Department. The aim is to try to establish if this meeting is educational to you, if it is helping your integration within a team and if it is helpful to your professional development in conjunction of other disciplines of health professionals. The goal is to find if the presence of different health professionals broadened your views and helped your understanding about their role in the pathway of delivering treatment to patients.
The hope is that the data of the study could be used as a platform to change the way of future undergraduate teaching. You are chosen because of your experience, global understanding and the clear perception of education and professionalism which you have.
Your complete honesty will be valued. The whole data is and will remain anonymously collected and will remain confidential. It will only be used for the purpose of the study. The interview will be recorded and the recordings will be transcribed and data will be analysed. You will be having the facility to use pseudonyms or numbers or letters during the recordings to protect your anonymity. The data will be kept for five years before it will be destroyed and will be used exclusively for the purpose of this study.

the MDM was useful and it carried educational value; examples of quotes:

"*Enjoyed the morning orthopaedic MDM's; learned a lot from the case discussions*……."

or

"*MDM very comprehensive at a good and understandable level, information was forthcoming and well shared*…."

These examples are supporting the belief of usefulness.

During the second stage interviews of the focus groups, again the indications were in favour of the constructive teaching whereby re-enforcing the cognition of the students.

"….*even just sitting there was a learning experience….. was definitely getting more involved and this increased our confidence as to how much we really knew*."

There were though the not frequent at all calls of some who felt that it was mainly a "*doctor led show*" and that there was only the prospective of "*managing the patient*". This was not obvious in the first stage but became obvious in the second stage but it was only limited to one of the focus groups and only by one individual.

The quote "*I think that it is interesting to see how they manage them (the patients) within their remits of what they can do and the resources. Personally I didn't feel as if it was too much of an MDM to be honest. I thought it was just very orthopaedic consultant led* …." is noticeable and interesting. It is a very valid point and seems that the performance of the tutor as well as the environment did not help any learning in that instance.

While analysing all the data (Table 5) using the original coding, it was found that the most frequent theme was that of the educational value, followed by the interpersonal collaboration in addition to the themes of communication,

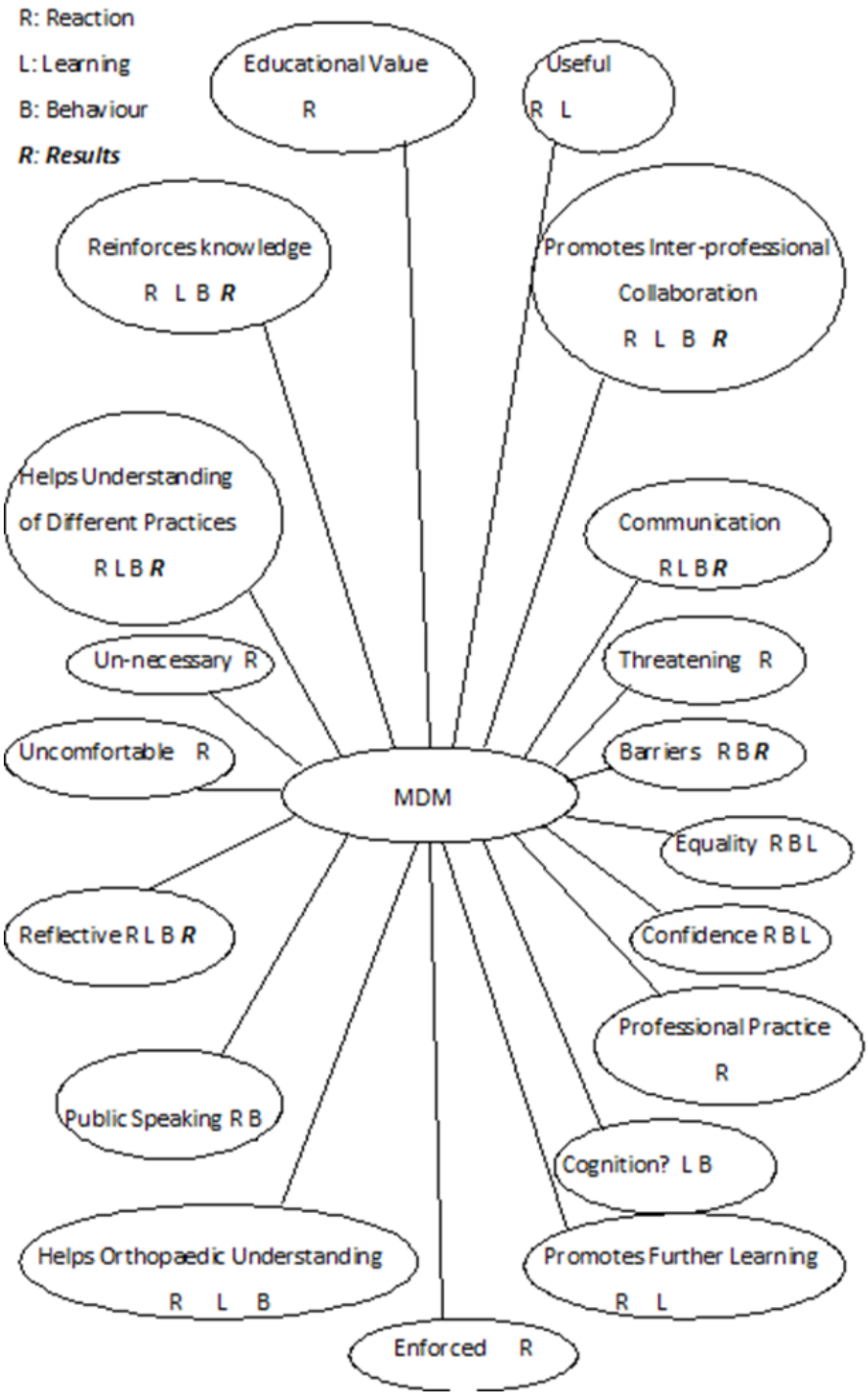

Figure 2. Kirkpatrick's hierarchy categories.

professional practice and understanding of the different practices.

When Kirkpatrick's hierarchy categories were used, the Reaction category (review of learning experience and perceptions of the students) was found to be favoured, followed by the learning category, but fewer of the participants achieved finalization of behaviour change or transferred the knowledge (Results) into their professional environment. The grouped data answers (Table 5) were assigned to the different Kirkpatrick's hierarchy categories. The data's frequency of occurrence was marked and added, resulting in the concluding findings

Table 5. Grouped data.

Educational value	54
Useful	54
Promotes inter-professional collaboration	42
Communication	58
Threatening	3
Barriers	14
Equality	52
Confidence	57
Professional practice	48
Cognition	56
Promotes further learning	56
Enforced	6
Helps Orthopaedic understanding	47
Public speaking	49
Reflective	30
Uncomfortable	4
Unnecessary	6
Helps understanding of different practices	47
Reinforces knowledge	54

Table 6. Kirkpatrick's hierarchy categories.

Reaction	681
Learning	390
Behaviour	290
Results	161

tabulated in Table 6.

There are the quotes like "*It's as valuable as an actual education in something new. There is definitely a place for us. I think that the biggest thing I took away from it was that it is quite a good confidence booster, as well as understand other practices and exchange opinions*"

and

"*Such a meeting could be established in our practices*".

In the final analysis of the results checking if the experience of the MDM was a positive or a negative one, the majority of the students agreed that it was positive, and only very few found it "uncomfortable", "unnecessary", "enforced" or "threatening". This was indicated in both stages.

DISCUSSION

Due to the nature and type of study, a number of questions would need to be addressed, including:

1. Did the students feel comfortable in the environment?
2. Was it a constructive learning experience?
3. Did the students feel welcomed?
4. Did the students achieve their objectives?
5. Will the inter-professional contact lead to collaboration and
6. Have the chiropractic students gained any confidence through this process?

In addition, the difference of the location in which the meeting takes place and the way in which this is delivered will be studied and the potential impact of these two parameters will be noted. The literature has shown that teaching in inter-professional meetings is condensed and delivered in non-clinical environments. Teaching includes presentation of cases studies, lectures or small group teaching (Cooper et al., 2001). In the present situation the interaction takes place in a clinical environment prior to the ward round. The students then have the opportunity to follow and observe the patient's journey to the end of the treatment; during this experience they are encouraged to exchange opinions.

Following this discussion the aim is to find out how the Chiropractic students are engaging with other professionals and if the MDM could be a factor which can influence future collaboration; if they learned how to work as a team with the others and if they will transfer this practice to their professional environment. If this type of MDM teaching is successful, it could provide an opportunity for other groups to develop similar programmes enhance student professional experience.

Therefore, is the MDM an educationally valid tool? Is the professional identity interfering with the common goal of common understanding? These questions add to the discussion as doubt exists with respect to the spirit of collaboration between professionals. There is a sense that there is a "tribal" way of confrontation within the meetings, as some deny their presence and participation in these multidisciplinary settings. It is found that allied medical professionals are willing to participate and collaborate between them and that the medical profession has some difficulty to participate (MacDonald, 1996; Naughton et al., 2011). There are some "barriers" to the MDM's success when it comes to inter-professional education. The initial obstacles are based on the behaviour of the different educational institutions.

Methods of allocating resources to the different disciplines of the students can contribute to different attitudes and perceptions which may create a sense of elitism for some. Another factor which can influence the interaction of the different groups is the teaching faculty which plays a fundamental role in promoting one professional group over another. All these can be easily overruled by the benefits of such a system which are cost-effectiveness, the increase of non-medical health

providers and the most important the greater understanding, collaboration and respect between professionals which leads to the greater patient satisfaction. (Singleton and Green-Hernandes, 1998; Chan et al., 2010).

This type of close educational collaboration can easily reflect in parallelity, the example being of a community within a neighbourhood where a lot of “strangers” live but when they develop common interests, they become “colleagues” working towards a common goal. But is this happening in our case? Do the Chiropractic students link themselves with the others? There is the need to establish if communication promotes collaboration.

It has been shown that MDM’s have the ability to become an educational tool (Kane and Luz, 2011). This study demonstrated that students of an allied health practice who are orientated on the private sector integrated successfully within the NHS and followed the meetings with great interest, learning and improving themselves and taking the experiences for their own benefit and their practices. The minority of the negative opinions can be explained by the failure of the tutor to establish educational connection and fell below the standards of the students’ expectations whereby leading them to believe that the meeting was only managerial even and that it was not necessary for them to participate or it could be the lack of engagement of the students due to their perceived professional identity.

Despite that, the majority of the answers received indicate that there was an element of Reaction according to Kirkpatrick’s hierarchy, the sum of the ability for the MDM to help learning or change behaviour and finally change the professional environment is greater. Chiropractors are health practitioners who work mainly privately in individual practices. There is the possibility that some will contribute to the attitude of the person who will not be teamed with anyone. In these cases, people who are having this stance may find that team interaction is not necessary. Is the tribalism the reason for these opinions or is it the failure of the tutor? The possibility of the tutor’s presence during the feedback interviews although is placed as a limitation does not seem to have any impact to the students’ opinion about the usefulness of the MDM. This conclusion derives from the very limited negative opinions about it. It was initially placed as limitation because during the feedback there were no negative remarks. On the other hand, another limitation is that the study was retrospective. But may be that time helped reflection and so the limited negative opinions were the product of such action as it was not possible to be expressed immediately after the placement.

CONCLUSION

It is shown that the vast majority of students achieved the fulfilment of Kirkpatrick’s hierarchy of learning and achieved behaviour changes as well as changes in their clinical practice. Although some felt that the MDM was “uncomfortable” or “enforced upon them”, the number was negligible compared to the majority of the expressed positive opinions. The participants developed teamwork and learned from the experience of other practitioners within the Health system, reinforcing their inter-disciplinary development. They proved that a MDM can be educational and constructive, stimulating the students with new cognition and teaching them new behaviours. This provides the potential for new practices to be transferred to professional environments by promoting inter-professional development for individuals.

Conflict of interests

There is no conflict of interest from any of the authors.

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Educational Research and Reviews

Full Length Research Paper

Discrimination level of students' ratio, number of students per faculty member and article scores indicators according to place of Turkish universities in international ranking systems

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The aim of this research is to determine classification in which the level of accuracy in Turkish universities rankings is detected by the international assessments according to the independent variables PhD students ratio, the number of students per faculty member and the article scores. The data of research were obtained from University Ranking by Academic Performance (URAP) in Turkey. The data were divided into three groups to international university ranking the top 500 (group A), 500 to 1000 (group B), and 1000 and 1500 (group C). Discriminant analysis was used to analyze the data. According to the findings of the study "PhD students' ratio" is variable to distinguish groups of universities who have contributed the most variable. Then "article score" and the last "the number of students per faculty member" are seen. Classification results are analyzed, a total of 10 universities in the A group, 9 (90%), a total of 15 universities in the B group, 10 (66.7%) and, finally, a total of 26 universities in the C group and 19 (73.1%) were classified correctly. The total percentage of correct classification of discriminant function is 74.5%. Classification accuracy of the discriminant analysis is higher than chance criterion (33 %). In other words, function obtained from the research makes a more accurate classification than change classification.

Key words: University ranking, Turkish higher education, PhD students' ratio, article scores, discriminant analysis.

INTRODUCTION

We can see that, in the first sentence of many books, scientific studies or articles begin with expression of globalization. Hence, as we feel the presence of the social life of globalization, it is said that a phenomenon is used to make sense of new concepts or approaches that impart on the social sciences. The phenomenon of globalization should be considered as an external frame because of the subject of this research is universities and need to compare universities national and international scale. University is a tool of globalization itself. On the

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other hand, it is generally agreed that globalization is the result of the compression of time and space that has occurred since advanced technology allows the instantaneous sharing of information around the world (Currie, 2003). Globalization and technological developments brought about by it changes taking place on the sharing of knowledge that individuals are required to be more careful in the subject requested service. In this case, the pragmatic philosophy will influence people or students selection of universities that will prepare themselves for the good life, provide the greatest benefit for her/himself after graduation; cost-benefit ratio is high and public high awareness in society. Therefore, globalization and pragmatist philosophy as the theoretical background of this research has been the subject of university ranking system

All over the world, educational systems of countries are expanding increasingly. Information age needs highly educated humans who have variety of qualifications. Students, businesses, and governments are requesting educational institutions to increase their technological infrastructure for teaching and research (Slaughter, 1990). Nowadays, the rapid technological and scientific advances have especially increased the demand for higher education institutions. The massification of higher education has been the rise of the knowledge economy and its globalization, a phenomenon that would not have been possible without a steady and substantial increase of highly educated and skilled labour (Meek, 2002). The high value assigned by individuals to their education has extensively increased the demand for information about the quality of universities and higher education systems (Docampo, 2012).

Each passing day more people have higher education graduates are entering the labor market. This situation leads to demand more qualifications by employers from people apply for a job. Students, as a customer, want to choose the correct university which can provide them better job opportunities. The rapidity of change in both student population and information production heightens this need for change in higher education (Stewart, 1997). Growth in supply and demand of higher education has increased the demands for information about the higher education service and this case has enabled to develop university ranking systems or league tables in many countries of the world (Dill and Soo, 2005). Ranking list and league tables also denominate values, allowing for a revaluing of the universities (Mittelman, 2013: 238). Therefore, the university ranking systems or league tables have become increasingly important.

Before discussing university ranking systems, it would be useful to recognize its historical development process. To examine the historical development it is necessary to recognize Carnegie Foundation, which came into existence in 1905 (Obasi, 2008). This Foundation was established as a center of independent educational research and policies. In 1967, commission was established in order to generate solutions for the problems in the American Higher Education System by Carnegie Foundation. In 1970, the Commission developed its first classification scheme of universities 'to support its program of research and policy analysis' (Obasi, 2008), which has been revised in 1976, 1897, 1994, 2000, and 2005 (Toutkoushian and Webber, 2011: 135). In subsequent years, the foundation has developed criteria to evaluate the quality used to rank universities. In other words, the criteria established to determine the quality of universities in later years was used to rank universities. As a result, the ranking of universities today, the Carnegie Foundation's efforts are based on nearly half a century (Obasi, 2006). Although Carnegie Foundation studies are the basic of university ranking systems, the structure of known today, university rankings began in 1983, when the US News and World report started to publish the annual America's best colleges review (Lukman et al., 2010).

Significantly increased in recent years, being more preferred university for students and qualified faculties and to increase their funds and income, universities are competing with each others in order to be better place in ranking systems published in journals (Grewal et al., 2008). With simple words, universities and institutions are competing with each other in order to be more preferred. If they wish to be at high rank in ranking systems, universities need to lead in this competition. However, university ranking systems that enable comparisons with other universities have many different purposes. To understand the goals of ranking systems can be beneficial to all higher education stakeholders. The goals of the university ranking systems may be summarized as follows (Jesensek, 2006):

1. guiding students for better choice to higher education programs,
2. evaluating the place of universities in the international higher education market,
3. directing universities at national levels on market orientation,
4. providing safe and affirmative competition for students, faculties, and the funders of universities and other higher education stakeholders

Global rankings seem to be more successful for allocating limited state resources among universities, basically because these rankings tend to be recognized as 'objective', or at least 'external' (Yonezawa, 2010). The university ranking which includes various purposes is created by taking advantage of the many varieties. The proportion of graduate and undergraduate students, financial incomes and expenses, number and quality of the staff, student experiences, learning outcomes, research metrics, and academic reputation in the community are some categories of indicators that are used to classify universities (İsmail, 2010). Furthermore,

Table 1. Main global rankings and date of origins

Main Global Ranking	Date of origin
Academic Ranking of World Universities	2003
Webometrics	2003
World University Ranking	2004-2009
Performance Ranking of Scientific Papers for Research Universities	2007
Leiden Ranking	2008
World's Best Colleges and Universities	2008
SCImago Institutional Rankings	2009
Global University Rankings, RatER	2009
Top University Ranking	2010
World University Ranking	2010
U-Multirank	2011

Source: Hazelkorn (2013).

each category may have hundreds of different indicators. The methods used in the ranking systems are great differences with each others, as well as the number and nature of indicators employed (Enserik, 2007). Also, ranking systems are in need of specific definition and quality criteria for evaluating the performance of a university (Lukman et al., 2010). Due to the presence of thousands of different indicators, ranking universities to compare them with each other is quite difficult. So that, which criteria will be used to make the sort of decision-making and to determine the weights of the criteria scores affect the validity of the ranking system.

University ranking systems have been implemented a long time in the Anglo-Saxon countries at national level (Erkkilâ, 2013: 5). Some of the most well-known international ranking schemes include the Academic Ranking of World Universities by Shanghai Jiao Tong University (which was first published in 2003), the Times Higher Education Supplement-QS World University ranking (Times QS ranking- followed Shanghai by the publication ranking in 2004), the Leiden University ranking, and the Taiwan Higher Education and the Accreditation Council ranking (Shin et al., 2011; Li, Shankar and Tang, 2011). Main global rankings and date of origins are presented in Table 1.

As shown in Table 1, the number of global ranking systems has increased rapidly since 2003. Ranking universities which are quite difficult to perform is beneficial in many respects. First of all university ranking systems are important tools to prove universities' academic reputation, increase the awareness and build brand value of higher education institutions. Students and their families, especially international students use rankings to choose universities for admission. Students and their families can obtain information about transnational universities have led to increased students' mobility. Feeling themselves obliged to choose a university is a crucial decision for their future trajectories made under imperfect information regarding their own ability, university quality and the corresponding returns to a degree (Horstschräer, 2012). It reveals the need for students to be more careful choosing the correct university for themselves. As a support to the solution of this problem, ranking tables offer information about the quality and other characteristics of higher education institutions, influencing the students' choice (Lukman et al., 2010). As well as university ranking systems influence students' university choice, provide regular information to other education stakeholders.

Government, industry and businesses use rankings for deciding funding, sponsorship and employment. Political leaders can use ranking results to frame education policies in the country. University administrators can use these rankings as evidence to seek support and funding etc. (İsmail, 2010). In this regard, university ranking system has contributed to the rationality of the decision about universities. It is believed that located in the upper ranks of the university ranking system will provide higher social returns. Therefore, it is necessary to transfer greater resources to this university. Given their importance, key performance indices are significant factors in promoting quality improvement and goal fulfillment (Amiz, 2010). On the other hand, the complexity and diversified viewpoints of higher education functions, performance evaluations of higher education have always been a hot debate topic among educators, managers, and policymakers (Wu et al., 2012). To summarize, university rankings constitute a logical response to that demand, and appear to help students, country officials and the public at large in making sense of a remarkably diverse higher education landscape (Docampo, 2012).

Following these developments, "university rankings" or ''league tables'', a novelty as recently as fifteen years ago, are today a standard feature in most countries with large higher education systems (Usher and Savino, 2007). The rapid increase of university ranking system in recent years and growing public interest can be

interpreted in many ways. The first of these cases is made changes in higher education management practices. As a result of liberal policies, the regulatory role of government is declining to university management and finance. Instead of the mechanisms of the government are efforts to guarantee the quality by emphasis on assessment practices. In other words, university ranking system refers to an aspect of accreditation in higher education. Secondly, universities are expected to be more accountable correspond to public resources used by them. Once and for all, universities increasingly want to be known more in the higher education market to gain an international dimension (Özkan, 2015). In this context, the ranking system has become an important mechanism for raising the university's reputation and image of the national and international level (Hägg and Wedlin, 2013)

University ranking systems come in two varieties: institutional ranking systems and sub-institutional ranking systems. Also they can be basically handled in two subtitles such as national and international ranking systems. National ranking systems evaluate higher education institutions within a country based on national priorities. On the other hand, international ranking systems make comparisons on the basis of more universal indicators. While rankings are a popular method for comparing the relative quality of higher education institutions, there is much confusion and debate over which indicators to use and how to present the information in ranked format (Clark, 2002).

There are currently more than ten lists of world universities ranking system. These are two of the best-known: The Academic Ranking of World Universities (ARWU), commonly known as the Shanghai Ranking; is a publication that was founded and compiled by the Shanghai Jiaotong University to rank universities globally. It is aimed to improving the quality of Chinese universities with ARWU. Also, ARWU was developed for purposes such as recognition and imitation of the best universities practice in the world. Accordingly, the first ranking has been a qualitative description of the factors that contribute to being a great university worldwide. The rankings have been conducted since 2003 and updated annually (Saka and Yaman, 2011). Since 2009, the rankings have been published by the Shanghai Ranking Consultancy. The Shanghai ranking focuses exclusively on research and does not rely on subjective data. All its indicators are open to public scrutiny, since they measure either scientific production or individual excellence recognized by very prestigious awards or by a high number of citations (Docampo, 2012). There is also criticism to the ARWU about results of the Shanghai ranking are irreproducible (Florian, 2007). ARWU ranks universities on a global level as compared to nearly 1,200 institutions of higher education today.

Another best-known ranking system is Webometrics. Webometrics is a large ranking system comparing the academic institutions of higher education on a global level. Webometrics ranks universities not only developed countries several hundred university but also all over the world. Webometrics is (a) a set of quantitative techniques for tracking and evaluating the impact of web sites and online ideas and (b) the information science research field that developed these ideas. Webometrics techniques include link analysis, web mention analysis, blog analysis and search engine evaluation, but from the perspective of digital library evaluation the main method is link analysis (Thelwall, 2013). Webometrics gives incentive to open access to the internet-based system in order to promote the transfer of scientific and cultural knowledge to society by universities. Therefore, the purpose of the system cannot assess universities web addresses by design, usability and the number of visitors. More than in this case It is seen that internet as a reliable mirror of the produce of the university. The Webometrics ranking table differs from the others, including indicators such as number of pages (recovered from four search engines Google, Yahoo, Live Search and Exalead), or the total number of unique external links received (inlinks) by a university site (Lukman et al., 2010). There are significant criticism to Webometrics. Although 'web presence' of universities is important in today's globalized world driven by the forces of information and communication technology, it is not however the most critical measure of institutional success in benchmarking exercises (Obasi, 2008). Out of them, Times Higher Education–QS World University Rankings, The Performance Ranking of Scientific Papers for World Universities, Leiden Ranking and Scimago are some of the best known ranking systems in the world.

The Anglo-Saxon higher education system has always been more competitive than the comparatively homogeneous continental European higher education sector (Horstschräer, 2012). Turkey is located between the developing countries, the formal higher education 35.6% in the process of transition to mass higher education enrollment rate (Tanrıkulu, 2011). The expansion of higher education in the world gained momentum especially after the 1950s like Turkish Higher Education System. Opened rapidly over the past ten years, the total universities number are reached about 184 (CoHE, 2014). Turkish universities league table is important for the college-age population in Turkey and foreign students who prefer Turkey Higher Education Institutions. Consequently, Turkey's ranking of universities that are effective in predicting the correct determination of the variables thought to be important. To the best of our knowledge, there is no such quantitative analysis in the national literature. Thus, it is considered very important to determinate the variables which is related on place of Turkish universities in world ranking.

Purpose of the study

The purpose of study is to determine classification in which the level of accuracy in Turkish universities

Table 2. Indicators and descriptions.

Indicators	Source	Description of Indicator
PhD students' ratio	ÖSYM (2013)	The number of doctoral students of the 2012-2013 academic year/ The total number of students in the same year
The number of students per faculty member	ÖSYM (2013)	The total number of students of the 2012-2013 academic year/ The number of faculty members for the year 2012
Article scores	WoS2	Number of article entering into screening SCI, SSSC and AHCI for the year 2013

rankings detected by the international assessments according to the independent variables PhD students ratio, the number of students per faculty member and the article scores.

For this purpose, the study was expected to answer the following research questions:

1- What are the distribution of independent variables PhD student ratio, number of students per faculty and article scores according to groups of dependent variable?
2- What are the effect of PhD student ratio, number of students per faculty and article scores on group classification?
3- What is the total correct classification percentage of discriminant function?

METHODS

Research model

The research was conducted according to correlational research. In correlational design, the investigators use the correlational statistic to describe and measure the degree of association (or relationship) between two or more variables or sets of scores (Creswell, 2012: 338) that might suggest further investigation using the experimental strategy to determine cause-and-effect relationships (Gravetter and Forzano, 2012: 355). With its ability to predict, correlational research gives the researcher a powerful tool (Goodwin, 2010: 339).

Population and sample

There are 193 higher education institutions in Turkey for from 109 state universities, 76 foundation university and foundation vocational high schools. The majority of these universities are the new university established after the years of 2000. In universities, the first 1500 entrants in the international ranking systems are determined by URAP. In this study, ranking is created by URAP. Due to these reasons, the sample of the research consists of 51 university institution from Higher Education System of Turkey. In this context, all universities in the world universities ranking first in 1500 were the study sample. Therefore, the entire population has been reached. The universities in study were divided into three groups to university ranking the top 500 (group A), 500 to 1000 (group B), and 1000 and 1500 (group C). 10 universities in A group, 15 universities in B group and 26 universities in C group are in sample.

Data collection

The data of research were obtained from University Ranking by Academic Performance Turkey. University Ranking by Academic Performance (URAP) Research Laboratory was established at Informatics Institute of Middle East Technical University in 2009. URAP is primarily focused on the ranking of Turkish universities; it made this ranking based on the data obtained through different international ranking systems for the first year. URAP conducted the national university rankings by creating its own indicators. The indicators that URAP used to create universities ranking in 2014 was used as data. It is shown in Table 2.

Table 2 indicates three indicators as independent variables in the study. First indicator is PhD student's ratio obtained from ÖSYM statistics. It said to be an important variable of the number of doctoral students in the university quality, when thought that there is a positive relationship between PhD training and institutionalization of university history. Second indicator is the number of students per faculty member obtained from likewise ÖSYM statistics. The number of students per faculty ratio is an indicator of the share of teaching resources available for students in tertiary education (Lukman et al., 2010). Student-staff ratio generally provides an overall indication of the effort made by universities to ensure that their students receive more personal provision (Eurydice, 2014). THE-QS, QS and U-Multirank use faculty/student ratio as a proxy for teaching quality (Hazelkorn, 2013). And lastly indicator is article scores obtained from WoS2. Academic publishing performance is an indication of the quality of academic human resources. Therefore the number of articles is an indicator of current scientific knowledge conductivity.

Data analysis

Data were analyzed by discriminant analysis. Discriminant analysis is used to classify cases into values of a categorical dependent (Garson, 2012: 7) and a statistical technique which allows the researcher to study the differences between two or more groups of objects with respect to several variables simultaneously (Klecka, 1980). The goal of discriminant analysis is to predict group membership from a set of predictors (Tabachnick and Fidell, 2001:496). In this study discriminant analysis was performed using three variables as predictors of membership in three groups. The universities were divided into three groups to university ranking the top 500 (group A), 500 to 1000 (group B), and 1000 and 1500 (group C). Predictors were PhD students' ratio, the number of students per faculty member and the article scores. This technique may be useful in the social sciences.

RESULTS

In this section, firstly descriptive statistics then the analysis findings made for the purposes of research is given. Table 3 presents descriptive of scores from independent variables that PhD Student Ratio Number of Students per Faculty and The Article Score.

Table 3. Descriptive statistics of PhD student ratio number of students per faculty and the article scores of groups with university ranking the top 500, 500 to 1000 and 1000 and 1500.

	The location of the university	N	$\bar{x}$	S
PhD Student Ratio	1-500	10	0.65	0.02
	501-1000	15	0.33	0.01
	1001-1500	26	0.17	0.03
Number of Students per Faculty	1-500	10	28.39	4.60
	501-1000	15	33.70	9.43
	1001-1500	26	38.57	10.79
The Article Score	1-500	10	162.39	14.35
	501-1000	15	130.56	16.00
	1001-1500	26	110.67	21.90

Table 4. Eigenvalues.

Function	Eigenvalue	Variance	Canonical Correlation
1	2.468	99.8	.894
2	.006	100	.077

It is seen from Table 3 that A group of universities on the average rate of doctoral students is 0.65, the average of Group B universities is 0.33, the average of Group C universities is 0.17. PhD Student ratio in Group A is higher than those of students in Group B and Group C. Analyzed the number of students per faculty member, the average of Group A universities is 28.39, the average of Group B universities is 33.70, the average of Group C universities is 38.57. The mean score of the article is examined, the average of Group A universities is 162.39, the average of Group B universities is 130.56, the average of Group C universities is 110.67. As shown in, PhD student ratio and the article scores of universities' averages decrease from Group A to Group C. On the other hand, the number of students per faculty member universities' averages increase from Group A to Group C universities.

One should test the assumptions used in discriminant analysis before interpreting this analysis results. For determining of one of the discriminant assumptions homogeneity of variance- covariance matrix should be assessed. Discriminant analysis is very sensitive to heterogeneity of variance-covariance matrices. Before accepting final conclusions for an important study, it is a good idea to review the within-groups variances and correlation matrices. Homoscedasticity is evaluated through scatter plots and corrected by transformation of variables (Poulsen and French, 2008).

The homogeneity of a variance-covariance matrix is assessed using Box-M statistics (Büyüköztürk and Çokluk-Bökeoğlu, 2008; Verma, 2013). Box- M statistics was not significiant. This finding shows that a variance-covariance matrix of groups is homogeneous (Çokluk et al., 2010: 121). Another assumption is data representing a sample from a multivariate normal distribution. The assumption of multivariate normality is scores on predictors are independently and randomly sampled from a population (Tabachnick and Fidell, 2001:462). As a result of the analysis, it is found that the data have normal distribution. The significance value indicates that the data are homogeneous and multivariate normal. This means one can proceed with the discriminant analysis. Eigenvalue, % variance and cumulative % of variance which indicates the proportion of variance explained (Tabachnick and Fidell, 2001:469) as shown in Table 4.

The produced two functions and eigenvalues are analyzed in Table 4. It is seen that eigenvalues for these functions are in the order of 2.468 to 0.06. As seen, .894 canonical correlation functions for the first and the second canonical correlation of .077 are determined as function. An eigenvalue indicates the proportion of variance explained. Although there is a limit on the eigenvalues of 0.40 higher eigenvalues from "good" is considered as (Kalaycı, 2005). However, as in the above Table 3 if there are multiple discriminant functions, the first function has the power of the largest and most important differential. Also other functions continue decreasing importance and power. When examining eigenvalues the first function is highly effective to separate groups.

The greater the canonical correlation coefficient of the relationship between the dependent is variable, the higher the discriminant function groups are. Dependent variable is the square of the canonical correlation

Table 5. Wilks' Lambda Statistics.

Function	Wilks' Lambda	Ki-square	Sd	p
1 to 2	.287	58.730	6	.000
2	.994	.278	2	.870

Table 6. Wilks' Lambda test of equality of group means.

Indicators	Wilks' Lambda	F	Sd_1	Sd_2	p
PhD Student Ratio	.360	42.628	2	48	.000
Number of Students per Faculty	.846	4.378	2	48	.018
The Article Score	.470	27.055	2	48	.000

Table 7. On the standardized discriminant function coefficients.

Indicators	Coefficients
PhD Student Ratio	.744
Number of Students per Faculty	-.086
The Article Score	.512

Table 8. The matrix coefficients of the structure.

Indicators	Coefficients
PhD Student Ratio	.848
Number of Students per Faculty	-.269
The Article Score	.675

coefficient of classification gives the percentage of how much disclosed by the independent variables. Accordingly, the dependent variable be grouped $(.894)^2$=0.80 primary function is explained by the variables forming (Garson, 2008).

Generally, we are only interested in disciriminant functions that discriminate between the groups at a level greater than chance. The procedure for doing this is to determine if all the discriminant functions taken together are significant (Cramer, 2003: 209). Testing the significance of the discriminant function Wilks' Lambda statistics are given in Table 5.

The value of Wilks' lambda provides the proportion of total variability not explained by discriminant model (Verma, 2013:394). Table 4 significance of the test are the eigenvalues of the discriminant functions. Wilks' Lambda value relates to the model, and discriminant function is used to determine the number of statistically significant. Wilks' Lambda is the ratio of within-groups sums of squares to the total sums of squares. A small lambda indicates that group means appear to differ. The associated significance value indicates whether the difference is significant. Here, the Lambda of .287 has a significant value. Because of that the group means appear to differ. In other words, Wilks' lambda indicates that first discriminant function is significant and that groups means appear to differ.

According to Table 5, the first and second functions are given in the table when testing the first test; the second test is only the second function test. According to this, in Table 5 together with the two functions Wilks' Lambda statistics, chi-square value of [$X^2_{(6)}$ = 58.730; p<.01] is significant. This finding suggests that the function has a high strength of allocation. In other words, the function creates independent (predictor) variables to distinguish groups of dependent variable having a significant effect.

In Table 6, levels of significance of each independent variable are examined, PhD Student Ratio [F(2, 48) = 42.628, p<.01], Number of Students per Faculty [F(2, 48) = 4.378, p<.01] and The Article Score [F(2, 48) = 27.055, p<.01] appears to be no significant differences between the groups in the average of all. In other words, to separate groups of universities, all the variables included in the analysis have a significant effect (p<.01). On the standardized discriminant function coefficients are presented in Table 7.

As it is clear in Table 7, "PhD Student ratio (.744)" is the most contributive independent variable to group classification. It is seen that "the article score (.512)" is ranked as second, and "the number of students per faculty member (- .086)" is the third. The matrix coefficients of the structure are presented in Table 8.

The structure coefficients of the matrix presented in Table 8 are analyzed; it is clearly seen that "PhD Student Ratio (.848)" has the highest correlation with the discriminant function, and "Number of Students per Faculty (- .269)" has the lowest correlation. On the other hand, while "PhD Student Ratio" and "The Article Score" have positive correlation values, "The Number of Students per Faculty Member" has a negative correlation.

Classification results obtained from discriminant analysis are presented in Table 9.

Table 9. The classification results.

	A Group Universities		B Group Universities		C Group Universities		Total	
	F	%	F	%	f	%	f	%
A Group Uni.	9	90.0	1	10.0	0	-	10	100.0
B Group Uni.	1	6.7	10	66.7	4	26.7	15	100.0
C Group Uni.	0	-	7	26.9	19	73.1	26	100.0

Total Percentage of correct classification = 74.5%.

Classification results are simple summary of number and percent of subjects classified correctly and incorrectly. The 'leave-one out classification' is a cross-validation method, of which the results are also presented. Analyzing the results of the classification presented in Tables 8, 9 of 10 A group universities (90%), 10 of 15 B group universities (66.7%) and 19 of 26 C group universities (73.1%) are classified correctly. The total correct classification percentage of discriminant function is 74.5%.

If discriminant function analysis is effective for a set of data, the classification table of correct and incorrect estimate will come up with a high percentage (Garson, 2012: 7). Due to their position in world universities ranking, the universities included in research are allocated in three groups. Therefore, the ratio of finding in which group a university is by chance is 33%. The total correct classification percentage of discriminant function is 74.5%, and it is higher than chance criteria.

DISCUSSION AND CONCLUSION

The aim of this research is to determine classification in which the level of accuracy in Turkish universities rankings is detected by the international assessments according to the independent variables PhD students' ratio, the number of students per faculty member and the article scores. The total accurate classification of the discriminant function was 74.5%. As a result of the research, all the variables (PhD students' ratio, number of students per faculty and the article score) included in the analysis to separate groups of universities have a significant effect. According to this finding, the world ranking place of Turkish higher education institutions should be paid attention in terms of these variables can be said to raise. PhD Student ratio" is the most contributive independent variable to group classification; "The article score" is ranked as second, and "the number of students per faculty member" is the third.

The "PhD Student ratio" is the most important variable for ranking university. If it is considered that the annual number of doctoral graduates in Turkey is relatively low compared with other developed countries (CoHE, 2014); it can be said that Turkey needs to develop policies to increase the number of doctoral graduates. It is possible to say that there is a positive relationship between doctoral education and the institutionalization history of the university. In other words, PhD student ratio is an indicator of the university's research capacity. Thus, policies should be developed to encourage research for Turkish Higher Education Institutions. In this sense, having a research-centered body can move the universities upwards in world university rankings.

Universities specializing in specific programs should be encouraged to further accept doctoral students. Waldinger (2010) says that faculty quality is a very important determinant of short- and long-run PhD student outcomes. Therefore, doctoral students determine the quality of the faculty, and the university's doctoral student ratio is universal indicator of quality.

In fact, the criteria of opening up the program to have a PhD in itself is a quality indicator. Doctoral programmes, which started to spread in the second half of the 20th century, have been established by and large among existing top universities (Ogawa, 2002). Therefore, the universities which have a rooted history are expected to be at the top of ranking lists. On the contrary of world universities, Turkish universities relatively have recent history. According to the 2012-2013 academic year data the number of doctoral students in Turkey is about 60,000 (ÖSYM, 2013). Turkish Higher Education system has a group of students. This number seems inadequate, and PhD student ratio is expected to increase in the future. Therefore, it can be said that Turkish universities placed in the world ranking could be better in the future.

Article score is second variable to distinguish groups of universities for this research. As a result of this, the number of articles produced by faculty members of universities affects the location of the university in world ranking list. In this mean, academic staff should be evaluated according to the performance. These performance criteria must be included in academic publications. When compared with other countries in terms of Turkey's population and economic size about academic publishing performance, it is understood that is not where it should be (SCImago, 2014). Turkey, having a continuously growing university system, is expected to improve its performance with the number of publications and citations in the coming years. Preparing publications by academics are associated with factors such as academics adequate research funding and research time. This situation is closely associated with factors such as

the financing of research, course load on the faculty, time allocated to research, the existence of different incentive structures on weight on research activities (CoHE, 2014).

Contrary to what was predicted, "the number of students per faculty member" is the last independent variable to group classification. Rankings concentrate mainly on research outcomes of leading research universities and the quality of teaching plays a minor role in them (Berndtson, 2013: 180). However, the small number of students is an important variable. A smaller number of students per faculty are viewed as equivalent to better teaching on the basis that small classes create the optimum learning environment (Hazelkorn, 2013). According to data from the year 2011,the number of students per faculty member is quite above average which is 15.6 of OECD countries in Turkey Although the increase in teaching staff in Turkey, the rapid increase in the number of students has resulted in a higher ratio. As the number of students per faculty is low, faculty can make much more and effective researches. This case enables faculty to educate more PhD students.

With university rankings gaining both in popularity and influence, universities develop strategies to improve their rankings (Grewal et al., 2008). The poor ranking performance of a country's universities may show deficient human capital accumulation and knowledge creation in need in the future (Hazelkorn, 2013). On the other hand, university ranking provides data to student for choosing the college, university administrators for better leadership, government and industry for investing, stakeholder for quality of the educational product. For this reason, by taking the determining variables that came up in the research into account, Turkish universities should aim the top ranks in the world university ranks, and should share their position in the ranking with the public permanently.

Recommendations for future research

In recent years, there have been rapid quantitative improvements in Turkish Higher Education. These quantitative developments are needed to support qualitative applications. To accomplish this, there should be scientific evidence and international different applications. In this context, it is suggested international comparative study may contribute to qualitative development of higher education. On the other hand, research is reproducible, different from variables considered under this study, with more qualitative data such as the quality of teaching, student and graduate satisfaction, employability. To bring a different approach, researchers can do a study, taking into account local culture, to determine the recognition of university ranking system by the public.

Conflict of Interests

The author has not declared any conflicts of interest.

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