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Comparison of the profiles of the potential teachers in different disciplines based on multiple intelligences theory (Samsun City Sample)

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Abstract

In this study, the profiles based on multiple intelligences theory of a total of 908 potential teachers studying in Science, Social Sciences, Mathematics, Music, Art and Physical Education at Ondokuz Mayıs University are compared. Multiple intelligences inventory which was taken from Saban has been used to determine the intelligence areas of the potential teachers. The collected data has been evaluated with SPSS 14.0 package program and statistical evaluation has been commented by using ANOVA and t-test. As a result of the study, according to the main disciplines studied by potential teachers and fields they graduated from high schools, some statistically significant differences have been found in their several intelligence areas. But according to their sexes, no statistical differences in any intelligence area have been found.
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Keyworlds: Multiple Intelligences inventory, potential teachers.

1. Introduction

Gardner developed multiple intelligence theory in 1983 proposing that intelligence had broader range which was far too limited to be explained by traditional IQ tests. Gardner says that IQ tests focus most on their linguistic, logical and some spatial intelligences, but intelligence is the skill of an individual to present a gift in more than one culture and to solve a problem which is encountered in daily or professional life efficiently (Gardner 1983).According to multiple intelligences theory, an individual is able to learn how to do and apply something in a different way from others.

Since the publication of the theory of multiple intelligences, educators have attempted to synthesize and develop the theory in terms of curriculum development, and teaching and learning. Accordingly, instead of asking, "How intelligent are students?" the question becomes: "How are students intelligent?" (Chan, 2003).

According to multiple intelligences theory, an individual has eight different kinds of intelligence.

Verbal – Linguistic Intelligence: This area has to with reading, writing, speaking skills. This intelligence area includes reading books, speaking, debating and order of words and verbal games.

Logical – Mathematical Intelligence: This area has to with numerical activities and calculations and the ability in solving patterns and relations between them and solving different problems with logic.

Visual – Spatial Intelligence: This area has to do with vision and creating spatial images in the mind. It also includes perceiving the visual objects and the spatial situations of the objects. It also deals with graphic arts, thinking in pictures, solving labyrinth problems and other spatial tasks.

Musical Intelligence: This area has to do with rhythm, music and it is a kind of skill to express oneself with the concepts composing music and dance. It includes listening to music, rhythmic activities and dance, singing or playing different musical instruments.

Bodily – Kinesthetic Intelligence: This area has to do with physical skills and coordination and using motor movement skills. It includes joining in different sportive activities and dance. It also deals with solving the problems requiring psychomotor skills.

Interpersonal Intelligence: This area has to do with interaction with others, understanding them and cooperating with them as a part of a group. Cooperative games, group projects and debates, books and materials from different cultures, dramatic activities or roles and games are included in this area.

Intrapersonal Intelligence: This area has to do with controlling oneself with his own emotions and motivations and working efficiently. Joining in independent projects and activities, reading and writing books and to be in quiet places away from crowd are included in this area.

Naturalistic Intelligence: This area has to with greater sensitivity in understanding the natural world of plants and animals and recognizing their characteristics and categorizing them. This intelligence also includes discovering the nature and working with the objects in nature and collecting and classifying them. (Gardner & Hatch, 1989).

In cases where students do not have verbal and logical skills in educational systems, there are also other fields such as art, music and sport that they can succeed (Köroğlu&Yeşildere, 2004).Taking these differences into consideration while teaching and training the potential teachers will enable these people to express themselves in a better way. Therefore, it can be said that approaches based on multiple intelligences theory may create positive changes on students' successes and attitudes towards the lesson (Korkmaz, 2001).

Tha aim of the study: The aim of the study is to reveal the profiles of potential teachers studying Science, Social Science, Mathematics, Music, Art and Physical Education and Sports based on multiple intelligences theory.

Main Problem: Are there any significant differences between the profiles based on multiple intelligences theory according to main fields of study that the potential teachers are studying?

Primary sub-problem: Are there any significant differences between the profiles based on multiple intelligences theory according to high school fields that the potential teachers chose?

Secondary sub-problem: Are there any significant differences between the profiles based on multiple intelligences theory according to the sexes of the potential teachers?

2. Method

2.1 Participants

A total of 908 students studying at Ondokuzmayıs University, in the fields of Science (204; 133 female, 71 male), Social Sciences (190; 88 female, 102 male), Mathematics (165; 121 female, 44 male), Music (47; 30 female, 17 male), Art (200; 147 female, 53 male) and Physical Education and Sports (102; 22 female, 80 male) have been randomly chosen and joined the study. The total number of the students studying in these fields is about 2.274. About 40% of all the students studying in these fields have joined the study. 541 of the students joined the study is female and 367 of them is male.

2.2 Procedure

The inventory of multiple intelligences areas for educators which was taken from Saban was applied to students (Saban, 2001). The inventory has got 10 chapters and 80 questions. It was prepared as quintet likert type. Grading is as follows; "0" does not suit me at all, "1" suits me little, "2" suits me partly, "3" quiet suits me, "4" suits me completely. The profile list of the inventory was used in grading. The total grades of the participants in 8 different intelligence areas were added according to the regulations and the grades each participant acquired in 8 different intelligence areas were determined. Accordingly, the total grades the participants acquired between"0-7 were determined as underdeveloped, 8-15 as somewhat developed, 16-23 as middle developed and 32-40 as very developed.

The students were asked the fields they chose in high schools (Verbal, Numerical, EA, Sport, Fine Arts) and their sexes together with multiple intelligence inventories.

Following the application, statistical analyzes were carried out by using the grades obtained from scales and SPSS 14.0 package program. ANNOVA and t-test were applied on the data.

3. Results

3.1. Main problem

Are there any significant differences between the profiles based on multiple intelligences theory according to main fields of study that the potential teachers are studying?

ANNOVA, scheffe test was used in statistical evaluation related to this problem and significant statistical results are shown in the tables (p<0.5).

Table 1 : Profiles based on verbal –linguistic intelligence according to the fields of the students.

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Verbal – Linguistic	Social	Science	,37921	,07331	,000*
		Maths	,61994	,07738	,000*
	Music	Science	,43419	,11765	,019*
		Maths	,67492	,12023	,000*
	Art	Science	,42078	,07236	,000*
		Maths	,66152	,07648	,000*
		Phy. Edu. Sports	,29824	,08848	,046*
	Phy. Edu. Sports	Maths	,36328	,09159	,008*

* The mean difference is significant at the .05 level.

According to verbal-linguistic intelligence area;
It was found out that Social and Music students had statistically more verbal-linguistic intelligence than Science and Mathematics students. Besides, Art students statistically had more verbal-linguistic intelligence than Science, Mathematics and Physical Education and Sports students. But, Physical Education and Sport students had more verbal-linguistic intelligence than Mathematics students.

Table 2 Profiles based on Logical -Mathematical intelligence according to the fields of the students.

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Logical – Mathematical	Science	Social	,36987	,07421	,000*
		Music	,49103	,11909	,005*
		Phy. Edu. Sports	,32353	,08926	,023*
	Maths	Science	,29234	,07706	,014*
		Social	,66220	,07832	,000*
		Music	,78337	,12169	,000*
		Art	,41273	,07741	,000*
		Phy. Edu. Sports	,61586	,09271	,000*
	Art	Social	,24947	,07456	,049*

* The mean difference is significant at the .05 level.

According to Logical-Mathematical intelligence area;
It was found out that that statistically more Logical-Mathematical intelligence than all the students in other fields. Also, Science students had more Logical-Mathematical intelligence than Social, Music and Physical Education and Sports students, and Art students had more Logical-Mathematical intelligence than the students in Social fields.

Table 3 Profiles based on Visual-Spatial intelligence according to the fields of the students

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Visual – Spatial	Music	Social	,43796	,12440	,031*
		Maths	,45790	,12626	,023*
	Art	Science	,81667	,07599	,000*
		Social	,98158	,07736	,000*
		Maths	1,00152	,08031	,000*
		Music	,54362	,12378	,002*
		Phy. Edu. Sports	,96373	,09291	,000*

* The mean difference is significant at the .05 level.

According to Visual-Spatial intelligence area;
Art students were found to have statistically more Visual-Spatial intelligence than all other fields. Besides, Music students had more Visual-Spatial intelligence than Social and Mathematics students.

Table 4 Profiles based on Musical intelligence according to the fields of the students

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Musical	Music	Science	1,41176	,14190	,000*
		Social	1,63684	,14287	,000*
		Maths	1,65455	,14500	,000*
		Art	1,29500	,14216	,000*
		Phy. Edu. Sports	1,50980	,15461	,000*
	Art	Social	,34184	,08885	,012*
		Maths	,35955	,09223	,010*

* The mean difference is significant at the .05 level.

According to Musical intelligence area;
It was found out that Music students had more musical intelligence than all other fields. But, Art students had more musical intelligence than Social and Mathematics students.

Table 5 Profiles based on Bodily- Kinesthetic intelligence according to the fields of the students

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Bodily – Kinesthetic	Science	Maths	,28636	,07461	,012*
	Social	Maths	,34864	,07583	,001*
	Art	Science	,23833	,07091	,047*
		Maths	,52470	,07494	,000*
	Phy. Edu. Sports	Science	,83824	,08641	,000*
		Social	,77595	,08747	,000*
		Maths	1,12460	,08975	,000*
		Music	,77618	,12562	,000*
		Art	,59990	,08670	,000*

* The mean difference is significant at the .05 level.

According to Bodily- Kinesthetic intelligence area;
It was found out that Physical Education and Sports students had the highest Bodily- Kinesthetic intelligence. Also, Science and Social students had statistically more   Bodily- Kinesthetic intelligence than Mathematics students and Art students had statistically more Bodily- Kinesthetic intelligence than Science and Mathematics students.

Table 6 Profiles based on Interpersonal intelligence according to the fields of the students.

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Interpersonal	Social	Science	,31656	,07687	,005*
		Maths	,51754	,08113	,000*
	Art	Maths	,35833	,08018	,001*
	Phy. Edu. Sports	Maths	,33333	,09603	,035*

* The mean difference is significant at the .05 level.

According to Interpersonal intelligence area;
Art and Physical Education and Sports students had statistically more interpersonal intelligence than Mathematics students; likewise, Social students had more Interpersonal intelligence than Mathematics and Science students.

Table 7 Profiles based on Intrapersonal intelligence according to the fields of the students.

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Intrapersonal	Social	Maths	,32616	,07480	,002*
	Music	Maths	,43623	,11622	,016*
	Art	Science	,32480	,06994	,001*
		Maths	,54379	,07392	,000*
	Phy. Edu. Sports	Maths	,36114	,08853	,006*

* The mean difference is significant at the .05 level.

According to Intrapersonal intelligence area;
Social, Music and Physical Education and Sports students had more Intrapersonal intelligence than Mathematics students; likewise, Art students had more Intrapersonal intelligence than Mathematics and Science students.

Table 8 Profiles based on Naturalistic according to the fields of the students.

Intelligence field	Department	Department	MD	Std. Er.	Sig.
Naturalistic	Science	Maths	,36765	,09379	,009*
	Social	Maths	,52456	,09533	,000*
	Music	Maths	,56028	,14811	,014*
	Art	Maths	,65167	,09421	,000*
	Phy. Edu. Sports	Maths	,44118	,11283	,010*

* The mean difference is significant at the .05 level.

According to Naturalistic intelligence area;
 Students in all fields had statistically more Naturalistic intelligence than Mathematics students.

3.2. Primary sub-problem

Are there any significant differences between the profiles based on multiple intelligences theory according to high school fields that the potential teachers chose?
ANOVA scheffe test was used in statistical evaluation related to this problem ($p<05$).
According to Verbal-Linguistic, Intrapersonal, Interpersonal and Naturalistic intelligence areas;
It was found out that the students graduated from numeric fields of high schools had statistically lower intelligence according to these areas than other students.
According to Logical- Mathematical intelligence area;
It was found out that the students graduated from numeric fields of high schools had statistically more Logical- Mathematical intelligence than the students from verbal fields, EA and Fine arts.
According to Visual-Spatial intelligence area;
The students graduated from Fine Arts in high schools had the highest Visual-Spatial intelligence area. Also, the graduates of EA field had more Visual-Spatial intelligence than the graduates of numeric field.
According to Musical intelligence area;
It was found out that the graduates of Fine Arts in high schools had statistically more to Musical intelligence than the students graduated from verbal, numeric and EA fields.
According to Bodily-Kinesthetic intelligence area;
The graduates of numeric fields in high schools had lower Bodily-Kinesthetic intelligence area than the students graduated from other fields. Also, the graduates of EA field had more Bodily-Kinesthetic intelligence area than verbal fields; likewise, the graduates of Physical Education and Sports had more Bodily-Kinesthetic intelligence area than the graduates of verbal and Fine Arts fields.

3.3. Secondary sub-problem
Are there any significant differences between the profiles based on multiple intelligences theory according to sexes of potential teachers?
Independent sample t-test was used in statistical evaluation concerning this problem (0.5)
No statistically significant differences were found in the profiles of potential teachers according to sexes based on multiple intelligences theory.

4. Discussion

 According to the results of the study; it has been observed that the main fields of study of potential teachers and the fields they chose in high schools showed the some similarities with intelligence areas in multiple intelligences theory.
There are some other studies about comparison of the profiles of different potential teachers according to multiple intelligence theory in literature. In the study carried out by Durmaz and Özyıldırım, the profiles of the students in Science and Class Teacher Training were determined according to multiple intelligences theory and it was found that the students in Class Teacher Training had more values in verbal-linguistic intelligence area (Durmaz&Özyıldırm, 2005). In Oral's study on different potential teachers, it was reported that Mathematics and Science students had more logical-Mathematical area than the students in other fields and the students in Foreign Languages and Turkish Linguistic and Literature had more Verbal – Linguistic intelligence area. (Oral, 2001). These results support our data collected from our study.
In our study, it can be seen that there are not any significant differences when the data collected from potential teachers is evaluated.
In similar studies; in a study on adults carried out by Furnham and his colleagues, it was observed that male participants had more intelligence only in Logical-Mathematical area than females (Furnham et al., 1999). In a study on students in Science and Class Teacher Training carried out by Hamurcu and his colleagues, it was shown that male students had more Logical–Mathematical intelligence area (Hamurcu et al., 2002).In the study showing similarities with the results of our study carried out

by Berkant and Ekici, no significant differences were found between the profiles based on multiple intelligences theory according to the sexes of potential class teachers (Berkant&Ekici,2007).

In the light of collected results, if we are to make some suggestions; since achieving the educational system to function is primarily possible by familiarizing the students, by determining which intelligence areas the students belong to according to multiple intelligences theory before they start training and training appropriate for different intelligence areas may help students get more efficient education. It helps students illustrate themselves better and also helps them to be more efficient both in their educational and social lives. Therefore, determining the intelligence areas of students and facilitating to develop their intelligences in this area may help students express themselves better. It does not necessarily show that students' being undeveloped in Verbal-Linguistic and Logical- Mathematical intelligence areas means that they are not developed in Art, Music and Bodily intelligences, either. Unlike, it is a truth that individuals having Art, Music and Bodily intelligence areas are likely create excellent performances and get successful results in their own fields. Therefore, training the students adequately according to their own intelligence areas from the bottom to the top of educational system may help students show their skills.

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