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EVALUATION OF PRE-SERVICE TEACHERS' IDEAS ABOUT BRAINSTORMING METHOD IN TERMS OF SOME VARIABLES

Abstract

Brainstorming is a teaching method covering concepts such as critical thinking, decision taking, putting forward proposals for a solution to a problem, generating ideas and creative thinking. Through this method, students can hypothesize about the events, analyze events, make connections between topics, and reach accurate, reliable and definitive conclusions. The purpose of this study is trying to determine the views of the students studying at the Faculty of Education, on Brainstorming Method considering some demographic variables. The sample of the study constitutes 335 pre-service teachers studying at the Faculty of Education under Hakkari University in the 2014-2015 academic years. In the study, 'General Scanning Model', which is one of the descriptive methods, is used. Validity and reliability study of the 25-item 'Brainstorming Survey' used in the study was conducted and Cronbach's alpha internal reliability coefficient was calculated as 0.77. According to the results obtained in this study, it was concluded that the students studying at the Faculty of Education had information about Brainstorming Method, but this information was not at the desired level, students did not apply some of the features of this method in their lives and there was not any difference in opinions between boys and girls depending on the gender and grade level variables.

Keywords: Brainstorming, Critical Thinking, Hypothesis Building, Creative Thinking, Reasoning

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ÖĞRETMEN ADAYLARININ BEYİN FIRTINASI YÖNTEMİNE İLİŞKİN GÖRÜŞLERİNİN BAZI DEĞİŞKENLER AÇISINDAN İNCELENMESİ

Özet

Beyin fırtınası yöntemi eleştirel düşünmek, karar vermek, bir problemin çözümüne öneriler getirmek, fikir üretmek ve yaratıcı düşünmek gibi kavramları içine alan bir öğretim yöntemidir. Bu yöntem sayesinde öğrenciler, olaylarla ilgili hipotezler kurabilir, olayları analiz edebilir, konular arasında bağlantılar kurabilir, doğru, güvenilir ve kesin sonuçlara ulaşabilirler. Bu araştırmanın amacı; Eğitim Fakültelerinde okuyan öğrencilerin, Beyin Fırtınası Yöntemi hakkındaki görüşlerini bazı demografik değişkenler de göz önünde bulundurarak belirlemeye çalışmaktır. Araştırmanın örneklemini, 2014-2015 öğretim yılında Hakkari Üniversitesine bağlı Eğitim Fakültesinde okuyan 335 öğretmen adayı oluşturmaktadır. Araştırmada, betimsel tarama yöntemlerinden biri olan 'Genel Tarama Modeli' kullanılmıştır. Araştırmada kullanılan, 25 maddeden oluşan 'Beyin Fırtınası Anketi'nin geçerlilik ve güvenirlilik çalışması yapılmış ve Cronbach Alpha iç güvenirlik katsayısı 0,77 olarak hesaplanmıştır. Araştırmada elde edilen sonuçlara göre eğitim fakültesinde okuyan öğrencilerin, Beyin Fırtınası Yöntemi ile ilgili bilgilerinin olduğu ancak bu bilgilerin istenilen seviyede olmadığı, öğrencilerin bu yöntemin bazı özelliklerini yaşamlarında uygulamadıkları ve kız öğrenciler ile erkek öğrenciler arasında cinsiyet ve sınıf düzeyi değişkenine bağlı olarak bir görüş farkının olmadığı gibi sonuçlara ulaşılmıştır.

Anahtar kelimeler: Beyin Fırtınası, Fikir Üretme, Hipotez Kurma, Akıl Yürütme, Yaratıcı Düşünme

INTRODUCTION

Brainstorming concept was for the first time defined in a medical dictionary prepared by Georgia Gould in 1894 as "a succession of sudden and severe phenomena, due to some cerebral disturbance" or "a temporary mental seizure" (Duru, 2007). Then, Dr. Harry K. Thaw said in the court after a murder he committed in the United States in 1907, that he experienced a sudden burst of insanity and a brain-storm in response to the desire of taking his revenge, so he committed the murder (Pinta, 2010; Duru, 2007; Pinta, 2013). In the 1930's, brainstorming concept was redeveloped and raised again by Alex Osborn, employee in an advertising agency in New York called the Batten Barton Durstine. Osborn observed that any kind of criticism and assessment during brainstorming sessions prevented the imagination of people and stated that brainstorming prevented the functions such as all kinds of critical judgment, creativity and imagination (Özden, 1997). According to Osborne, this method can be used more effectively in groups. In order to use the method more effectively in groups and to increase the creativity in the groups, criticism should particularly be avoided, every thought that comes to mind should be told, as many thoughts as possible in a very short time should be tried to be produced and the idea emerged within the group should be developed (Heslin, 2001; Alacapınar, 2008; Özden, 1997; Nakiboğlu, 2003; Rawlinson, 1995).

As the brainstorming method mobilizes and activates right and left hemispheres of the brain together and increases a person's creativity, it is applied as a teaching method in various fields of education (Romiszowski, 1986; Mullen, et al., 1991; Paulus and Dzindolet, 1993). Brainstorming is a method developing creativity, used to be defended with different ideas, to think through the imagination, to generate ideas, and to solve an issue. The method has received this name as new views about the problem or problems are produced instantly like a *storm* in the learning environment, and therefore some educators also called this method *the Invention Brainstorming* (Demirel, 2011: 93; Tan, 2007; Paulus, 2000; Kaptan and Kuşakçı, 2002).

According to Romiszowski, brainstorming method is a group discussion method aimed at improving problem-solving ability (Bilen, 2006: 119). Brainstorming is a creative method used to bring solution to an issue, to give decisions, to think through imagination and to produce ideas (Güven, 2011: 191; Demirel, 2006: 85). Brainstorming is one of the methods used to demonstrate creative thoughts and is based on expressing thoughts on a topic loudly without any criticism and judging (Aykaç, 2005: 90). Brainstorming is also used for purposes such as solving a problem or clarifying an issue. The subject or the problem that will be processed according to this method should be chosen so as to ensure the participation of all the students in the class, should comply with the program's objectives, the problems should suggest multiple solutions for the problems, the students should have prior knowledge on the subject, should encourage creativity and should bring the course to an interesting situation (Uzunboylu and Hürsen, 2011: 63; Açıkgöz, 2005: 157-158).

According to this method, the students are compelled to think, seek solutions and produce ideas in order to find solutions to a raised a problem or an issue. According to Ayas, Çepni and Ayvacı (2007: 164), brainstorming is a method that can especially be used to motivate the students to think and to make them productive. In order for the brainstorming to be effective and encourage creativity, behaviors such as such as laughing and ridiculing the proposals should not be made and shy and quiet students should be given opportunities to speak (Açıkgöz, 2005: 158). Moreover, the instructor should establish an impulse-response bond with the students and should endeavor to continue the discussion in a live atmosphere by constantly motivating and exciting the students in the class (Bilen, 2002: 165-166).

While seeking a solution to a problem by using the brainstorming method, novel, different and interesting solution recommendations are raised by different people and sometimes different from the same people. Gordon (2009) argues that brainstorming is an entertaining method that enhances creativity, and generates new ideas and thoughts. Students sometimes get to know themselves with this method, realize their imagination so they can better motivate to the subjects as their self-confidence increases.

According to Gürdal, Bayram and Şahin (1998), the instructors should start the education with preparatory questions and should provide motivation with the brainstorming method. According to Baumgartner (1997), brainstorming is an effective way to be able to put forward an opinion about a topic and an effective method for the solution of a problem. During the application of this method, there should be an explicit problem and ideas should be stated after thinking about this problem. Then, in order not to forget the ideas put forward, it is necessary one notes down these ideas put forward. Thus, all the ideas put forward are recorded. Then, those who put forward the idea or ideas explain the ideas one by one. The other people in the

group select and evaluate for solutions the most important or the most logical ones among all the ideas put forward.

According to Ayas, Çepni and Ayvacı (2007: 164), the following points must be remarked during the process of the brainstorming method:

1. The ideas of any student should not be disregarded and criticized.
2. The idea of another student should be able to be discussed and developed or an individual idea should be able to be combined with the idea of another person.
3. The number of the ideas should be increased as much as possible, that is the students should be able to contribute by saying any kind of ideas about the topic.
4. Unexpected and original ideas should be revealed.

According to Romiszowski (1986: 322), there are some certain steps to be followed in implementing the method. These steps are; the objectives of the discussion should be described and the problem should be defined, duration must be determined, any kind of remedy should be noted without discussion, what was said after the discussion should be analyzed, criticized and assessed, and the solutions must be agreed, and by looking at the level of success, it must be decided whether to continue the discussion.

Problem Statement

At what level are the knowledge, attitudes, perceptions and thoughts of the pre-service teachers studying at the Faculty of Education about the brainstorming method?

The Purpose of the Study

The purpose of this study is trying to determine the knowledge, attitudes, perceptions and thoughts of the students studying at the Faculty of Education, on Brainstorming Method considering also some demographic variables (gender, department, grade level, age and graduated school). In the study, a variety of suggestions about the brainstorming method have also been tried to be introduced by benefiting from the thoughts of the students.

The Significance of the Research

With reference to the findings obtained from this study, it is regarded that the students, educators, teachers and academics will approach to the problems more decided, creative, analyzing and hypothesizing and that they will suggest true impressions through brainstorming method. Thus, the study is considered to be the guide about the brainstorming method to all the students, academics, educators, teachers and the readers.

METHOD

Population and Sample

The population of this research constitutes the students studying at the Faculty of Education under Hakkari University and the sample of the study constitutes the students studying at the departments of the Teaching of Religious Culture and Moral Knowledge, Computer and Instructional Technology Teaching, German Teaching, English Teaching,

Primary School Teaching and Turkish Teaching at the Faculty of Education under Hakkari University.

Research Model

This study was conducted to determine the knowledge, attitudes and thoughts of students studying at the Faculty of Education about Brainstorming Method considering also the demographic variables of gender, type of department, class level, age and graduated school. For this purpose, the questionnaires and scales used in the researches related to the subject have been scanned by the researcher and a new *Brainstorming Scale* has been developed and used in the research basing on *Directed Brainstorming Technique: A Study on the Parents' Views about Scamper* by Yağcı, (2012*) the Effects of Associative Exercises on the Idea Generation During Brainstorming* by Coşkun, (2009) and the study of Selvi, (2003) *A Case Study-the Needs and Problem Analysis with Brainstorming Technique*. For the survey to be used in the research, first a field survey was conducted, then open-ended questions related to the subject were asked to the students studying at the Faculty of Education and with reference to the answers to these questions, a 41-item draft questionnaire was created. After the necessary analytical study, after subtracting 16 items, a 25-item questionnaire was created and after the revision of the survey by four faculty members, who were experts in the field, necessary corrections were made and the survey was finalized.

Validity and reliability studies of "Brainstorming Scale" used in the study were re-conducted and Cronbach's alpha internal reliability coefficient of 25-item scale was calculated as 0.77. The answers of the students participated in the study to the survey depending on the demographic variables were calculated by using Anova test which is an F test, t-test and one-way variance analysis with the help of SPSS 20 statistical software package. The survey used in the study consists of five point likert type 25 items including (1) Strongly Disagree (2) Disagree, (3) Undecided, (4) Agree, and (5) Strongly Agree. Ranges of options and overall assessment of the survey items used in the study were calculated and determined as below (Sarıgöz, Cengiz and Özkara, 2014).

$$RO = \frac{HV - LV}{NO} = \frac{5-1}{5} = 0{,}8$$

RO: Range of Options

HV: The Highest Value

LV: The Lowest Value

NO: Number of Options

1.00 - 1.80: Strongly Disagree

1.81 - 2.60: Disagree

2.61 - 3.40: Undecided

3.41 - 4.20: Agree

4.21 - 5.00: Strongly Agree

The survey was conducted on a total of 335 students studying at the departments of Religious Culture and Moral Knowledge Teaching, Computer and Instructional Technology Teaching, German Teaching, English Teaching, Primary School Teaching and Turkish Teaching at the Faculty of Education in Hakkari University and depending on some demographic variables, knowledge, attitudes and thoughts of the students related to the brainstorming method were tried to be determined. In the study, "General Screening Model", one of the descriptive methods was used. General screening model is the screening

arrangements carried out on a group, sample group or a paradigm or the entire universe in order to draw conclusion about the universe composed of numerous elements (Karasar, 2005: 79).

FINDINGS

In this part of the research, demographic data about students who participated in the survey, the data obtained about the survey used in the study and the statistical findings, interpretations and observations about of this data are presented.

Table 1: Demographic Data of Students Participated in the Research

Depart Ment	Number of Students		Level of Class				Gender	
	N	%	N	%	N	%	N	%
Teach. of Comp.	51	15.22	1st gr=24	48.08	Fem.=11	45.83	Male=13	54.17
			2nd gr=27	51.92	Fem.=10	37.04	Male =17	62.96
Teach. of Rel. Cult.	98	29.25	1st gr=55	56.12	Fem.=18	32.73	Male =37	67.27
			2nd gr=43	43.88	Fem.=14	32.56	Male =29	67.44
German Teach.	29	8.66	1st gr=15	51.72	Fem.= 8	53.33	Male = 7	46.67
			2nd gr=14	48.28	Fem.= 6	42.86	Male = 8	57.14
English Teach.	50	14.93	1st gr=26	52.00	Fem.=15	57.69	Male =11	42.31
			2nd gr=24	48.00	Fem.=14	58.33	Male =10	41.67
Prim. Sch. Teach.	55	16.42	1st gr=30	54.55	Fem.=18	60.00	Male =12	40.00
			2nd gr=25	45.45	Fem.=13	52.00	Male =12	48.00
Turkish Teach.	52	15.52	1st gr=28	53.85	Fem.=11	39.29	Male =17	60.71
			2nd gr=24	46.15	Fem.=13	54.17	Male =11	45.83

From the data in Table 1, it was determined that 51 (15,22%) of 335 students who participated in the research were studying at the Department of Teaching of Computer and Instructional Technologies, 24 (48,08%) of the students studying at this department were at the 1st grade and 11 of these students (45,38%) were female, 13 of them (54,17%) were male, 27 of the students (51,92%) were at the 2nd grade, 10 of these students (37,04%) were female and 17 of them (62,96%) were male. It was determined that 98 (29,25%) of 335 students who participated in the research were studying at the Department of Religious Culture and Moral Knowledge Teaching, 55 of the students studying at this department (56,12%) were at the 1st grade and 18 of these students (32,73%) were female, 37 of them (62,27%) were male, 43 of the students (43,88%) were at the 2nd grade, 14 of these students (32,56%) were female and 29 of them (67,44%) were male. It was determined that 29 of 335 students who participated in the research (8,66%) were studying at the Department of German Teaching, 15 of the students studying at this department (51,72%) were at the 1st grade and 8 of these students (53,33%) were female, 7 of them (46,67%) were male, 14 of the students (48,28%) were at the 2nd grade, 6 of these students (42,86%) were female and 8 of them (57,14%) were male. It was determined that 50 of 335 students who participated in the research (14,93%) were studying at the Department of English Teaching, 26 of the students studying at this department (52,00%) were at the 1st grade and 15 of these students (57,69%) were female, 11 of them (42,31%) were male, 24 of the students (48,00%) were at the 2nd grade, 14 of these students (58,33%) were female and 10 of them (41,67%) were male. It was determined that 55 of 335 students who participated in the research (16,42%) were studying at the Department of Primary School Teaching, 30 of

the students studying at this department (54,55%) were at the 1st grade and 18 of these students (60,00%) were female, 12 of them (40,00%) were male, 25 of the students (45,45%) were at the 2nd grade, 13 of these students (52,00%) were female and 12 of them (48,00%) were male. Again, it was determined that 52 (15,52%) of the students who participated in the research were studying at the Department of Turkish Teaching, 28 of the students studying at this department (53,85%) were at the 1st grade and 11 of these students (39,29%) were female, 17 of them (60,71%) were male, 24 of the students (46,15%) were at the 2nd grade, 13 of these students (54,17%) were female and 11 of them (45,83%) were male.

Table 2: t-test Analysis Results of the Students' Responses to the Brainstorming Scale According to Gender

Gender	N	$\overline{X}$	Ss	Sd	t	p
Female	151	87,68	12,83	333	,045	,964
Male	184	87,61	12,21			

p>0.05

From the data in Table 2, in respect to the responses of the students who participated in the research to the Brainstorming Survey, it can be mentioned that there was no significant difference between male and female students according to the gender by looking at the (p> .05) t-test results.

Table 3: t-test Analysis Results of the Students' Responses to the Brainstorming Scale According to Class Level

Class Level	N	$\overline{X}$	Ss	Sd	t	p
1st Grade	178	87,49	13,61	333	,239	,811
2nd Grade	157	87,82	11,10			

p>0.05

From the data in Table 3, in respect to the responses of the students who participated in the research, to the Brainstorming Survey, it can be mentioned that there was no significant difference between 1st grade and 2nd grade students according to the class level by looking at the (p> .05) t-test results.

Table 4: Dunnet Test Analysis Results of the Students' Responses to the Brainstorming Scale According to the Type of Department

Department	N	$\overline{X}$	Ss	Variance Source	Sum of Squares	Sd	Mean Square	F	p	Sig. Diff. (Dunnett)
1) Comp.T	51	85,20	8,21	Bet. Gr.	2247,93	5	449,586	2,974	,012	6-1
2) Rel.C.T	98	85,12	12,32	With Gr.	49738,08	329	151,183			6-2
3) German	29	86,86	13,16	Total	51986,01	334				
4) English	50	88,40	16,01							
5) Prm Sc.	55	90,09	11,78							
6) Turkish	52	87,64	11,50							

p<0.05

From the data in Table 4, in respect to the responses of the students of the Faculty of Education who participated in the research to the Brainstorming Survey, it was determined that there was a statistically significant difference between Turkish Teaching, Teaching of Computer and Instructional Technologies, Teaching of Religious Culture and Moral Knowledge in favor of Turkish Teaching according to the type of class in terms of the students' thoughts regarding the Brainstorming Method [$F_{(2,974)}$, $p_{(,012)}$; $p < .05$].

Table 5: Dunnet Test Analysis Results of the Students' Responses to the Brainstorming Scale According to the Age Variable

Department	N	$\overline{X}$	Ss	Variance Source	Sum of Squares	Sd	Mean Square	F	p	Significant Difference (Dunnett)
1) 17-19age	62	86,68	11,60	Bet. Gr.	577,28	4	144,319	,926	,449	
2) 20-22age	179	88,81	13,01	With Gr.	51409,74	330	155,787			
3) 23-25age	57	85,54	10,20	Total	51987,02	334				
4) 26-28age	25	86,92	16,57							
5) 29- age	12	87,64	7,67							

$p > 0.05$

From the data in Table 5, in respect to the responses of the students of the Faculty of Education who participated in the research to the Brainstorming Survey, it was determined that, depending on the age variable, there was no statistically significant difference between the students aged 17-19, 20-22, 23-25, 26-28 and 29-and over in terms of the students's thoughts regarding the Brainstorming Method [$F_{(,926)}$, $p_{(,449)}$; $p > .05$].

Table 6: Dunnet Test Analysis Results of the Students' Responses to the Brainstorming Scale According to the Graduated School Variable

Department	N	$\overline{X}$	Ss	Variance Source	Sum of Squares	Sd	Mean Square	F	p	Significant Difference (Dunnett)
1) Sci-Anat	82	88,54	11,73	Bet. Gr.	122,31	3	40,771	,260	,008	1-4
2)Voc.H.Sch.	153	87,63	13,11	With Gr.	51864,70	331	156,691			
3) Sup.H.Sch.	71	87,06	11,39	Total	51987,01	334				
4) Others	29	86,59	14,05							

$p < 0.05$

From the data in Table 6, in respect to the responses of the students of the Faculty of Education who participated in the research to the Brainstorming Survey, it was determined that, depending on the graduated school variable, there was a statistically significant difference between the students graduated from Science-Anatolian High Schools and other schools in favor of the students graduated from Science-Anatolian High Schools in terms of the students's thoughts regarding the Brainstorming Method [$F_{(,260)}$, $p_{(,008)}$; $p < .05$].

Table 7: Arithmetic Averages of the Students' Responses who Participated in the Brainstorming Survey

BRAINSTORMING SURVEY ITEMS	$\overline{X}$	Skill Level
10. It provides the ability to see beyond the state and circumstances.	4,42	Str. Agree
2. Everyone in the group must contribute to the solution of the problem.	4,37	Str. Agree
4. Generating ideas is important in brainstorming method.	4,31	Str. Agree
7. Brainstorming method is method and process of working with a group.	4,22	Str. Agree
6. The aim is to reveal creative thoughts.	4,13	Agree
11. The problem must be delt with different dimensions.	3,95	Agree
21. The sitting position must enable all the members to see each other.	3,91	Agree
24. Interrogation and assessment must be done at the end of discussion.	3,83	Agree
25. A solution to the problem must be decided at the end of discussion.	3,82	Agree
22. New ideas can be suggested under the light of given information.	3,81	Agree
23. What have been said must be analyzed at the end of discussion.	3,80	Agree
9. It develops the ability to develop and execute ideas.	3,79	Agree
8. It carries creative features when being the part of an innovation.	3,74	Agree
17. Every member in the group must be given the equal voice respectively.	3,64	Agree
18. Criticism and judgement must not be done in brainstorming method.	3,62	Agree
15. Time period to be used in brainstorming method must be determined.	3,31	Undecided
14. In brainstorming method, firstly the problem must be defined.	3,11	Undecided
19. The speaker must not be interrupted during his/her time.	3,10	Undecided
16. Creative and new approaches must be demonstrated.	3,08	Undecided
13. The objective must be determined and explained in brainstorming method.	3,05	Undecided
3. Number of people in a group must be between 5 and 20.	2,62	Undecided
12. Any opinion must be noted without discussion.	2,58	Str. Disagree
5. Thoughts must be voiced loud.	2,51	Str. Disagree
1. Silence leads to failure in brainstorming method.	2,49	Str. Disagree
20. Each speaker must offer only one proposal.	2,48	Str. Disagree

General Arithmetic Average: 3.51

From the arithmetic average of the answers of the students to the survey in Table 7, it was determined that article 10 stating *"It provides the ability to see beyond the state and circumstances."* ($\overline{X}$ =4.42), article 2 stating *"Everyone in the group must contribute to the solution of the problem."* ($\overline{X}$ =4.37), article 4 stating *"Generating ideas is important in brainstorming method."* ($\overline{X}$ =4.31), article 7 stating *"Brainstorming method is method and process of working with a group."* ($\overline{X}$ =4.22) were the items with the highest arithmetic averages in the survey. In respect to the answers given to the survey items, it can be stated that the students have knowledge of the basic features of the brainstorming method.

Again, from the arithmetic average of the answers of the students to the survey in Table 7, article 20 stating *"Each speaker must offer only one proposal."* ($\overline{X}$ =2.48), article 1 stating *"Silence leads to failure in brainstorming method."* ($\overline{X}$ =2.49), article 5 stating *"Thoughts must be voiced loud."* ($\overline{X}$ =2.51), article 12 stating *"Any opinion must be noted without discussion."* ($\overline{X}$ =2.58) were the items with the lowest arithmetic averages in the survey. In respect with the

answers to the survey, it was concluded that the students had basic information about brainstorming method, but they did not have sufficient information in terms of implementation of the brainstorming method.

RESULTS AND RECOMMENDATIONS

Results

This research has been carried out to determine the knowledge, attitudes, perceptions and thoughts of the students studying at the departments of the Teaching of Religious Culture and Moral Knowledge, Computer and Instructional Technology Teaching, German Teaching, English Teaching, Primary School Teaching and Turkish Teaching at the Faculty of Education under Hakkari University on Brainstorming Method. In the research, it was also tried to be determined whether the thoughts of the students about brainstorming method differ depending on the variables of gender, grade level, age, graduated school and department. As a result of the t-test analysis of the students' responses who participated in the research to the Brainstorming Questionnaire depending on the *gender* variable, it was concluded that there was no significant difference between male and female students. Therefore, it was determined that male and female students showed similar thoughts and behaviors about brainstorming method.

As a result of the t-test analysis of the students' responses who participated in the research to the Brainstorming Questionnaire depending on the *grade level* variable, it was concluded that there was no significant difference between the 1st grade and 2nd grade students. Therefore, it was determined that 1st grade and 2nd grade students also showed similar thoughts and behaviors about brainstorming method.

As a result of the analysis of the students' responses who participated in the research to the Brainstorming Questionnaire depending on the *department* variable, among the students studying Turkish Teaching, Computer and Instructional Technology Teaching, Teaching of Religious Culture and Moral Knowledge, it can be said that the students studying at the Department of Turkish Teaching had higher perceptions about the brainstorming method.

As a result of the analysis of the students' responses who participated in the research to the Brainstorming Questionnaire depending on the *age* variable, it was concluded that there was no significant difference depending on the age variable, considering the t-test results of students' responses to the Brainstorming Questionnaire, aged 17-19, 20-22, 23-25, 26-28 and over 29. Therefore, it was determined the students showed similar thoughts and behaviors about the brainstorming method depending on the age variable.

As a result of the analysis of the students' responses who participated in the research to the Brainstorming Questionnaire depending on the *graduated school* variable, among the students graduated from the Science-Anatolian High Schools and those graduated from the other schools, it was concluded that the students graduated from the Science-Anatolian High Schools had higher perceptions about the brainstorming method.

As a result of the analysis of the students' responses who participated in the research to the Brainstorming Questionnaire, it was determined that the items with the highest arithmetic means were the items related to *contribution to the solution of the problem, generating ideas,*

the method being specific to the groups, the method being the process and *being able to see beyond the conditions*, and the items with the lowest arithmetic means were the items related to *number of the groups, noting the opinions without discussion, talking loud, silence leading to failure* and *limiting the propositions*.

Considering the general arithmetic mean of the questionnaire with reference to the responses of the students to the Brainstorming Questionnaire, general arithmetic mean can be seen to correspond to "*I agree*" just above the middle level as the overall value. These case states that the students did not have the desired level (*Strongly Agree*) information about brainstorming, and their attitudes, thoughts and perceptions were below the desired level.

Recommendations

Brainstorming Method is a method that can be used at every stage of education, as it develops the skills of the students such as creativity, reasoning, finding solutions and problem solving. As the method is motivating the students to talk, it also motivates the students to talk and think by avoiding their silence. Therefore, the method can also be used especially in the courses at rehabilitation schools.

As the brainstorming method is used to increase the motivation of students in the courses, it is available in both verbal and math courses. When the students' motivation towards the courses is increased, their attention to the courses will increase consequently and this will lead to better understanding the courses.

As the students' discussing and giving suggestions to each other is at the forefront in the method, students' features such as salutation and expressing themselves will develop.

Brainstorming method is an ideal method for classes with the population changing between five and twenty people. The method is used with the purpose of education in most European countries. Due to its functions such as the students feel free in the courses, self-motivating themselves completely to the topics being covered, reasoning and contributing to the solution of problems, the method ensures success in education. Therefore, the curriculum of the courses can be reorganized based on some of the features of the method.

On order to use the brainstorming method effectively in the classes, teachers should be given in-service trainings or courses by various institutions or organizations to be able to increase the students' success.

Brainstorming method can be used not only in formal education but also in non-formal education. The students telling their ideas, intervening where they think is missing or wrong and expressing their ideas in solving a problem or an issue particularly in distance education and postgraduate courses taught through teleconference may be more effective in courses taught using this method.

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