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EXAMINATION OF THE EFFECTS OF DIFFERENT PRESENTATION TYPES ON THE ATTENTION AND MEDITATION LEVELS OF INDIVIDUALS THROUGH BRAIN WAVES

FARKLI SUNUM TÜRLERİNİN DİKKAT VE RAHATLIK DÜZEYLERİNE ETKİSİNİN İNCELENMESİ

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ABSTRACT

In this study, it was aimed to investigate the relationship between different types of presentations with attention and meditation levels of teacher candidates with brain waves. The study is a quantitative research. The study was based on a semi-experimental single subject research design. An adapted alternating treatments design was used in the study. The sample was formed by convenience sampling model. Convenience sampling model is aimed to select the sample from easily accessible and feasible units because of the limitations in terms of time, money and labor. For this reason, students and academicians from different departments studying at Ondokuz Mayıs University in 2016-2017 education period were taken into consideration taking both time and accessibility into consideration. At the end of the study, the MANOVA Test was performed, normality tests and the extreme values, the calculation of the multi-variance Mahalanobis distance values were checked and the data were found to be normal distribution in both ways. The Box test showed that there was no significant difference between the covariance matrices and the Levene test showed that error variances for the dependent variable scores would be considered equal. As a result, it was observed that different presentation types prepared for different sensory organs had significant differences according to the meditation and attention levels among the groups in some respects. When the data were analyzed in detail, it was found that there was a significant difference between the groups in terms of attention (p = .00) and level of meditation (p = 0,000) but no significant difference in terms of blinking (p = 0.371). In the second part of the study, it was seen that writing a text did not make a significant difference in the level of attention and meditation. However, it has been observed that the sudden drops in attention level and the range of these sudden decreases are significantly different in terms of their range values. Especially, it can be said that the attention interval band has a lot of variation in the attention measurements during short time measurements (1- 2 minutes).

Key words: Attention, Meditation Level, EEG

ÖZ

Bu çalışmada farklı sunu türlerinin öğretmen adaylarının dikkat ve meditasyon düzeyleriyle ilişkisinin beyin dalgalarıyla incelenmesi amaçlanmıştır. Çalışma nicel bir araştırmadır. Çalışma tek denekli yarı-deneysel tasarıma dayalı bir çalışmadır. Çalışma uyarlamalı dönüşümlü uygulamalar modeline göre desenlenmiştir. Örneklem seçkisiz olmayan örnekleme yöntemlerinden, kolay ulaşılabilir durum örneklemesiyle oluşturulmuştur. Uygun örnekleme, zaman, para ve işgücü açısından var olan sınırlılıklar nedeniyle örneklemin kolay ulaşılabilir ve uygulama yapılabilir birimlerden seçilmesidir. Bu nedenle hem zaman hem de ulaşılabilirlik göz önüne alınarak Ondokuz Mayıs Üniversitesinde eğitim gören farklı bölümlerdeki öğrenciler ve akademisyenler örnekleme alınmıştır. Çalışmanın sonucunda, MANOVA Test, öncesi, tek değişkenli normallik koşulu normallik testleri ve uç değerlerle, çok de-ğişkenli Mahalanobis uzaklığı değerlerinin hesaplanması kontrol edilmiş, verilerin her iki şekilde de normal dağıldığı görülmüştür. Box Testi, kovaryans matrisleri arasında anlamlı bir fark olmadığını Levene testi ise bağımlı değişken puanları için hata varyanslarının eşit kabul edileceğini göstermiştir. Sonuçta farklı sunum türlerinin gruplar arasındaki rahatlık ve dikkat düzeyleri ile göz kırpma sayıları açısından Tek Yönlü Çok Deişkenli Varyans Analizi sonucuna göre bağımlı değişkene göre anlamlı farklılıklar olduğu gözlenmiştir. Veriler ayrıntılı incelendiğinde dikkat (p=.00) ve rahatlık düzeyi (p=0,000) açısından gruplar arasında anlamlı farklılık olduğu fakat göz kırpma açısından (p=0,371) anlamlı bir farklılık bulunmadığı görülmüştür. Çalışmanın ikinci kısmında ise bir metin yazdırmanın dikkat ve rahatlık düzeyinde anlamlı bir fark oluşturmadığı görülmüştür. Bununla beraber dikkat seviyesindeki ani düşüş ve artışlardaki bant aralıklarının farklı olduğu gözlemlenmiştir. Özellikle kısa süreli (1- 2 dakika) süreli dikkat ölçümlerinde dikkat ortalama bandının çok fazla değişkenlik gösterdiği söylenebilir.

Anahtar Kelimeler: Dikkat, Rahatlık Düzeyi, EEG

2. AIM

Learning can be defined as permanent cognitive, affective, and behavioral changes occured in the individuals. Learning is influenced by many variables related to the environment, context and learning process in which the learner takes place. However, many different learning approaches, theories and models emphasize the importance of the attendion for learning (Senemoğlu, 2002). Attention can be briefly defined as the focus of the mind on a particular activity. The attention process involves mental alertness and choice. The mind is prepared to catch the incoming stimuli, and when it arrives, it orders and selects the appropriate ones among them (Öztürk, 1999). Attention is considered to be the first step in starting learning in many different teaching models, from Gagne's teaching model to social learning theory, 5 E learning model and quantum learning (Senemoglu, 2002).

Another important element in the learning process is the level of meditation. Based on brain-based learning theory, the relaxed alertness phase, defined as the brain's optimum state for learning, is accepted at the first step of the learning process (Erişti, 2012). The brain is like a camera lens. It is opened up when a person is confronted with a problem, when he is interested in something or when he feels himself innocent and childlike. It is closed when it detects feelings of helplessness or when it is stressful (Caine & Caine 2002). The level of meditation can be affected by many physical and psychological influences. For example, learning is diminished when general arousal and anxiety are too high and too low (Başarır, 1990; Erkan, 1991). It often makes learning difficult. The level of arousal must be moderate so that learning takes place. At this point, it can be said that the study of the level of meditation can be considered as an important variable in studies related to learning (Seven and Engin, 2008).

Electrical recordings from the brain surface indicate that the brain has a continuous electrical activation (Valverde, 2016). The first major breakthrough in our understanding of the brain in recent years was Donald O. Hebb's principle that when two neurons fire together the synapse is altered through growth and they will tend to wire together. This biological principle is the reason for the brain's great efficiency, because the organ from the beginning of its development tends to link neural groups into loops or maps that oscillate in synchronous rhythms (which principle has long underlain the practice of meditation), allowing actions to be coordinated and thereby enhancing the output among different populations of neurons (Mallgrave, 2010). The oscillations in these electrical potentials are called brain waves. The electrical activity of the brain in the sleep-wake state can be plotted on paper, and the electrical activity of the brain according to the functional state can be measured by EEG. These are recorded from the brain surface as local and whole brain fields by techniques such as EEG (Electroencephalogram) and MEG (Magneto Ensafalo Gram). This activity can be measured in terms of the number of oscillations per second (Hz), depending on the brain's different states of consciousness.Recent years, using portable EEG devices especially for educational purposes and researches is very popular in Turkey as well as in the World (İnel, 2014, Dündar, 2012; Yıldız, 2006; Sezer, İnel and Seçkin, 2015, Aydoğan and Aydoğan, 2016, Sezer, İnel and Seçkin, 2017). Furthermore, Tabakcıoğlu, Çizmeci, Ayberkin (2016) developed a computer program. Via the program, they load the course materials into system. Students enter the system with their user name and password. Then study the first subject. If meditation and attention rates are high students pass to second subject. Otherwise, students have to study the subject again. Whenever these rates are high, students pass to second subject. Altough these kind of studies is still infancy and reminds programmed learning of Skinner and bevaiorism, it is not so far that the future of classrooms will use this technology in many ways. In this study, the effects of the types of presentations prepared for different sense organs on the teacher candidates' level of attention and meditation was investigated through brain waves.

3. METHOD

The study is a semi-experimental study based on a single-subject design. Single-subject studies are the kind of designs studies, in which the effectiveness of an application is assessed in each subject by taking replicate measurements under standard conditions, shown among the quasi-experimental studies because participants can not be unbiased (Sönmez, Kot, Pınar, 2017). Alternating Treatments Design compares the effects of two or more treatments on the same behavior. It answers the question "Is one treatment more effective than another?" • The purpose is to determine which condition is more effective in changing one behavior (Tekin-İftar ve Kırcaali-İftar, 2006;(Tekin-İftar, 2012;Wolery, Gast ve Hammond, 2010; Tekin-İftar, 2000). . An adapted alternating treatments design was used in the study. This design is used to evaluate the effects of two or more independent variables on two or more dependent variable. In the case of adapted alternating treatments design independent two or more treatments are alternated rapidly in time. Alternating Treatments Design is used when it is required to determine the relative effectiveness of more than one treatment on a given behavior,

baseline data are either unavailable or might be unstable, treatments are sufficiently different from each other, participants can discriminate the treatment conditions (Tekin, 2000).

In this study, different types of presentations were individually given in different formats in the form of texts, poems, pictures, sounds, virtual reality in half minutes in order to meet the requirements of the adapted alternating treatments design and attention and meditation levels of the participants were measured via brain waves during these presentations. In the study, brain waves and attention and meditation levels obtained from each measurement taken for different types of presentations from different age and occupational groups were analyzed as a percentage of frequency and whether there was a significant difference among the variables

In the first stage, a common theme that can be used in the experimental phase has been identified. In the second stage, video images, pictures, sound, and writing materials related to these common theme that appeals to different sense organs have been created. In this part of the semi-experimental study, different stimuli such as video image, picture, sound, and writing about a theme were presented to the students within a certain period of time and the average attention and meditation levels during that period were recorded. The poem is read first, then the poem is read, the pictures are displayed and finally the voice is played in one group. The picture is shown first, then poetry is read and then the voice is played and the text is read in another group. The video, the audio and visual part of materials take a half minute to watch. At the last stage, the brain waves of individuals were recorded at normal level (ie, the situation expected without doing anything) and when writing about nature, and the difference between normal situations and writing situations was examined. A suitable portable device was used to measure brain waves. There are two main variables in the study, namely attention and meditation level. These are the variables that the portable EEG device reflects as a result of measuring brain waves. The focus of attention in the study is the result of the concentration of the brain waves, which is the result of concentrating on something, and the meditation means relaxation and calmness of the mind that can be translated as relaxed alertness. It is limited by the study participants, the types of presentations given, and the yields received for a half-minute.

4. PARTICIPANTS

The sample was formed by convenient sampling method. Due to the limitations in terms of time, money and labor, sampling is to be selected from easily accessible and practicable units in this sample. For this reason, students and academicians from different departments studying at Ondokuz Mayıs University were taken into sample. The study was conducted with 179 different measurements of participants from different age groups. Most of the participants are undergraduate, graduate and PhD students, while the other part is academicians of different age groups. However, these variables are not given in this study because the participants were not analyzed according to demographic variables such as age, occupation group.

5. DATA COLLECTION TOOLS

Figure 1. Neurosky brain wave device.

By the Neurosky brain wave device (Fig. 1), attention and meditation levels can be shown in a range of .00-100.00, and, the average of attention and meditation levels within a certain period of time can be obtained with appropriate treatment. This type of data can give feedback about the cognitive states of individuals like the same heart rate measuring devices.

6. FINDINGS

In this study, when Kolmogorow-Smirnov, Lilliefors and Shapiro-Wilk normality tests were used to examine the attention, meditation and blink averages of all experimental groups, it was determined that the distribution at $p < .05$ level and was not normally distributed. However, when the normality distribution of each group given

different presentations was examined, it was found that> 0.05 value was obtained and the distribution did not show any significant difference from the normal distribution (Table 1). At this point it can be stated that the distribution between the groups of different presentation types is not normal, but that the distribution of the groups within themselves is expected to be normal.

When the descriptive analysis of 179 measurements in total given different presentation types in the first stage of the analysis were examined, it was found that the average of attention level was found to be 50.59, the average of meditation level was found to be 51.11, and the blinking average was 51.87. The attention level was took the minimum value of 18, the meditation was took the minimum value of 22, and the blink level was took the minimum value of 40. The highest attention level was 77, the highest meditationt level was the highest 80, and the highest blink level was the highest 111. Parametric test to determine whether there is a significant difference between averages of more than one dependent group (text, voice, poem, picture, vr (virtual reality), writing) and more than one dependent variable (attention, meditation, blink) is MANOVA test. As shown in Table 1, it is seen that the normality requirement for the one-way MANOVA is obtained as the result of the analysis .

Table 1. Univariate Normality Test Results

	Group	**Kolmogorov-Smirnov[a]**			**Shapiro-Wilk**		
		Statistic	df	Sig.	Statistic	df	Sig.
Attention	Sound	.09	37	.20*	.96	37	.21
	Text	.09	37	.20*	.96	37	.21
	Poem	.08	33	.20*	.97	33	.58
	Picture	.08	37	.20*	.96	37	.22
	Virtual Reality	.13	15	.20*	.97	15	.85
	Writing	.10	20	.20*	.95	20	.43
Meditation	Sound	.13	37	.10	.95	37	.17
	Text	.13	37	.10	.95	37	.17
	Poem	.06	33	.20*	.97	33	.70
	Picture	.07	37	.20*	.98	37	.93
	Virtual Reality	.18	15	.19	.94	15	.44
	Writing	.08	20	.20*	.98	20	.98
Blink	Sound	.10	37	.20*	.96	37	.23
	Text	.10	37	.20*	.96	37	.23
	Poem	.10	33	.20*	.94	33	.09
	Picture	.14	37	.05	.96	37	.30
	Virtual Reality	.14	15	.20*	.95	15	.52
	Writing	.28	20	.00	.60	20	.00

In addition to test for univariate normality, multivariate normality, ie, the number of combinations of each variable with other variables should be checked. Since there is no test for the direct control of multivariable normality in normal versions of SPSS, this count can be indirectly controlled by SPSS with Mahalanobis distances. In this study, this method is used. Since the number of independent variables was six, and the p level was accepted as 0.01, the values of Mahalanobis over 16.81 were accepted as extreme values. When Mahalanobis values are examined at this point, it is seen that the critical value of the 164th ranked participant is higher (47,73). For this reason, this variable has been removed from the data. In the one-way MANOVA test, the relationship between dependent variables should be examined because the groups were compared according to the averages of more than one variable, taking into account the relation between them. For this, it is necessary to look at simple correlation coefficients between dependent variables. When the simple linear correlation coefficient between the dependent variables was examined as in Table 2, there was significant relationship in a low level in the positive direction between the degree of attention and meditation, but no significant relationship was found between blink and attention. In fact, MANOVA should have a reasonable correlation between dependent variables in order to be able to give the expected results. The level of meditation was found to be negatively correlated with low level of blink. However, since the correlation coefficients are below 0.9, it can be said that there is no multiple correlation between the data.

Table 2. Simple Linear Correlation Coefficient Between Dependent Variables.

		Attention	Meditation	Blink
Attention	Pearson Correlation Sig. (2-tailed)	1	.30**	.05
			.00	.47
	N	178	178	178
Meditation	Pearson Correlation Sig. (2-tailed))	.30**	1	-.03
		.00		.66
	N	178	178	178
Blink	Pearson Correlation Sig. (2-tailed)	.05	-.03	1
		.47	.66	
	N	178	178	178

**. Correlation is significant at 0.01 level.

When the Levene test result for the equality of variances was examined (Table 3), the hypothesis that there was no statistically significant difference between the groups' variances was accepted because p> 0.05. In this case, the variances of the groups may be regarded as equal because there is no significant difference between them. For this reason, the Tukey test was chosen for this study. We can now pass the one-way MANOVA test to check the accuracy of other estimates.

Table 3. Levene Test Results for Equality of Variances.

	Levene Statistic	Sig.
Attention	.88	.49
Meditation	.76	.57
Blink	.50	.76

Table 4 gives the descriptive values of the participants in different experimental settings. For example, the attention level is the lowest in the virtual reality (vr) while the highest value in the stimuli used in the form of sound and text. A similar interpretation can be made in the average of the meditation level.

Table 4. The results of Descriptive Analysis

	Group	Mean	Standard Deviation	N
Attention	Sound	56.91	12.55	37
	Text	56.91	12.55	37
	Poem	47.30	15.98	33
	Picture	49.35	13.20	37
	Virtual Reality	43.86	11.31	15
	Writing	50.57	14.33	19
	Total	51.78	14.08	178
Meditation	Sound	55.67	10.73	37
	Text	55.67	10.73	37
	Poem	49.42	10.12	33
	Picture	49.00	11.26	37
	Virtual Reality	41.93	12.87	15
	Writing	54.63	12.60	19
	Total	51.85	11.77	178
Blink	Sound	53.02	7.21	37
	Text	53.02	7.21	37
	Poem	54.87	8.32	33
	Picture	53.89	7.24	37
	Virtual Reality	51.86	5.26	15
	Writing	50.42	6.85	19
	Total	53.17	7.27	178

The variance-covariance matrices which are one of the Manova numerators are controlled by SPSS with Equality of Box Matrix Covariance Matrices. When this analysis is done, MANOVA can be calculated because p = 0,557 or p> 0,05. Acceptance of the absence hypothesis does not make a significant difference between types of presentations "or" types of presentations may be considered equal ".

The table that contains the actual results of the one-way MANOVA analysis is the Multivariate Tests table. The effect refers to the "investigated effect" in there. When Wlk's Lambda statistic is examined it is seen that p value is 0,05> p. This means that there is a significant difference between the scores uana obtained from the linear combination of the scores of the different groups. Partial Eta Square shows the magnitude of the effect of the selected statistic.

In summary, the MANOVA Test, pre-measured normality tests with univariate normality condition, and calculation of multi-variable Mahalanobis distance values with extreme values, showed normal distribution of the data in both ways. The Box test showed that there was no significant difference between the covariance matrices and the Levene test showed that error variances for the dependent variable scores would be considered equal. As a result, it was observed that there were significant differences between the different presentation types according to the results of the one-way Multivariate ANOVA with respect to the meditation and attention levels of the groups and the number of blinks. When the data were examined in detail, it was found that there was a significant difference between groups in terms of attention (p = 0,001) and meditation level (p = 0,000) but no significant difference in blinking (p = 0.371).

In the second part of the study, it is aimed to compare the average of two repetitive measurements of one group. Findings were obtained about the differences between attention, meditation and blink averages in pre-writing and writing process for participants who were asked to write a small paragraph on the same theme. In Table 5, female participants are symbolized with f and each is coded by a number. Similarly, male participants were symbolized by m and each was coded by a number. In the group, when no presentation is given, the attention average is found to be 56.5, while the attention average is found to be 51.1 in the writing process. The attention level of 6 subjects from the 10 participants was decreased, three of them was increased and one partipants' attention level remained unchanged. The are six participants whose attention was decreased by 9 points, there are three participants whose attention was decreased by 14 and 15 points, there is one participant whose attention was decreased by 26 points. There is one participant whose attention was increased by 9 points, there is one participant whose attention was increased by 14 points and There is one participant whose attention was increased by 17 points (Table 5).

Table 5. Attention, Meditation and Blink Average and Variations of Writing Task of Participants.

	Normal	**Writing**	**Normal**	**Writing**	**Normal**	**Writing**
	Attention	Attention	Meditation	Meditation	Blink	Blink
f1	57	43 (-14)	40	38 (-2)	50	50 (0)
f2	68	53 (-15)	48	50 (+2)	49	51 (+2)
f3	47	47 (0)	47	64 (+17)	49	67 (+18)
f4	50	54 (+4)	45	49 (+4)	51	50 (-1)
m1	50	44 (-6)	42	37 (-5)	61	52 (-9)
m2	78	52 (-26)	74	54 (-20)	51	66 (+15)
m3	64	50 (-14)	61	39 (-22)	53	51 (-2)
m4	68	59 (-9)	54	73 (+19)	43	49 (+6)
m5	45	54 (+9)	76	62 (-14)	45	50 (+5)
m6	38	55 (+17)	53	69 (+13)	47	56 (+9)
average	56,5	51,1	54	53,5	49,9	54,2

When no presentation was given, the average of meditation level was found to be 54, while the average of meditation level was found to be 53.5 in the writing a text process. In the writing process, the meditation level of five individuals increased as the other five individuals participants decreased. Table 6 shows that the frequency of attention-level change interval is between 10-15 interval for f = 4, is between 5-10 interval for f = 2, is between 0-5, 15-20 and 25-30 intervals for f=1 and is between 20-25 for f=0. The meditation level was the between 0-5 interval for f = 4, is between 15-20 interval for f = 3, is between 10-15 interval for f = 2 and finally is between 20-25 for f=1 .

Table 6. The Frequency of Attention, Meditation and Blink Average and Change of Written Task Participants.

Variable/f		0-5	5-10	10-15	15-20	20-25	25-30
Attention	+	1	0	1	1	0	0
	-	0	2	3	0	0	1
Meditation	+	2	0	1	2	0	0
	-	2	0	1	1	1	0

The parametric test to determine whether there is a statistically significant difference between the averages of the data values obtained after two consecutive measurements on the same data source is called the Paired Samples T Test. The Wilcoxon signed-rank test is a non-parametric statistical hypothesis test used when comparing two related samples, matched samples, or repeated measurements on a single sample to assess whether their population mean ranks differ. The next step of the Wilcoxon sign test is to sign each rank. If the original difference < 0 then the rank is multiplied by -1; if the difference is positive the rank stays positive (Can, 2016).

Table 7. Descriptive values.

	N	Ortalama	Std. Sapma	Minimum	Maximum
pretest	10	56.50	12.61	38.00	78.00
posttest	10	51.10	5.08	43.00	59.00

The descriptive values given in Table 5 for the level of attention were calculated by using the Wilcoxon test. In Table 8, it is seen that six individuals have negative values, three individuals have positive values an done participant have 0 values in terms of measurement difference. According to the test statistics, p = 0.235. There is no significant difference because p> 0,05. However, the fact that six individuals have negative values may indicate that it is more inclination in the negative direction.

Table 9. Rank values.

		N	Mean Rank	Sum of Ranks
posttest - pretest	Negative Ranks	6[a]	5.42	32.50
	Positive Ranks	3[b]	4.17	12.50
	Ties	1[c]		
	Total	10		

a. posttest < pretest

b. posttest > pretest

c. posttest = pretest

For the level of meditation, the descriptive values given in Table 7 were calculated by using the Wilcoxon test in Table 9. In Table 10, the averages, standard deviations, and minimum and maximum values of each measurement are given,

Table 10. Descriptive Values

	N	Mean	Std. Deviation	Minimum	Maximum
pretest	10	54.00	12.64	40.00	76.00
posttest	10	53.50	13.15	37.00	73.00

In Table 11, it is seen that the 5 individuals have negative ranks, 5 individuals have positive ranks. According to the test statistics, p = 0.838 hence, there is no significant difference because p> 0,05.

Table 11. Rank Values

		N	Mean Rank	Sum of Ranks
sontest - öntest	Negative Ranks	5[a]	5.90	29.50
	Positive Ranks	5[b]	5.10	25.50
	Ties	0[c]		
	Total	10		

a. posttest < pretest

b. posttest > pretest

c. posttest = pretest

7. RESULTS AND DISCUSSION

When descriptive analysis of 179 different measurements were examined, it was found that the average of attention level was found to be 50, 59, the average level was found to be 51, 11, and the blinking level was found to be 51.87. Moreover, when the values of kurtosis and skewness were examined, it was found that the level of attention and meditation functions showed a normal distribution. Attention level have lowest value of 18, meditation level have lowest value at 22 and blinking have lowest value at 40. The highest attention level was 77, the highest meditation level was 80, and the highest blink level was 111. At this point, when a measurement is made with this criterion, it can be concluded that the average level of attention of an individual engaged in any cognitive task is 51 and the level of meditation is about 51.

In the first part of the study, the MANOVA test was performed, the normality tests with univariate normality condition and the calculation of extreme-variance Mahalanobis distance values were checked with the extreme values, and the data were found to distribute normally in both ways. The Box test showed that there was no significant difference between the covariance matrices and the Levene test showed that error variances for the dependent variable scores would be considered equal. As a result, it was observed that there were significant differences between the different presentation types according to the result of one way Multivariate Variance Analysis according to the degree of convenience and attention levels among the groups and the number of blinks. When the data were examined in detail, it was found that there was a significant difference between the groups in terms of attention (p = .00) and level of meditation (p = 0,000) but no significant difference in blinking (p = 0.371). In the second part of the study, it was seen that writing a text did not make a significant difference in the level of attention and meditation. However, it has been observed that the sudden drop in attention level and the increments in those sudden drops and rises are different in terms of interval.

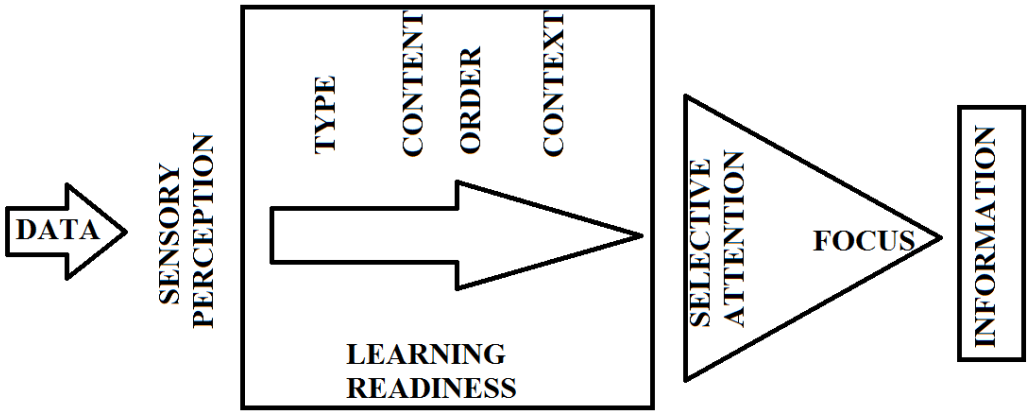

Figure 2. Data attention and information relationship can be conceptualized as in the figure

Inel, (2014) and Sezer, İnel, Seçkin and Uluçınar (2015) found that when students are asked any questions, their attention is decreased. In this study, it was found that this may vary according to different presentation types. As a result, the order and type of a presentation may change the level of attention and meditation levels. In this context, various variables such as the type of data, the order of data, and the gender of the recipient are effective in transforming data, which is the most basic information unit, into meaningful memorable or memorable information (Figure 2). Aydogan, and Aydoğan (2016) have partially supported the study of the finding that different color presentations change the level of attention and meditation in their study. Nevertheless, it can be said that the long-term focus and the level of meditation can be given as a proposal for future studies of studying in longer process and multi-participatory experimental designs. In addition, it is thought that the studies based on stimulants having characteristics with smaller information units is expected to give more healthy results because it is difficult to determine quantitatively what the individual is paying attention to during presentation in a short term designs having to many variables. This may be achieved only through post- qualitative data, one-on-one interviews, focus group interviews, etc.

Finally it can be suggested that in order to attract the attention of the students during the course entrance, instead of focusing on a single material at a particular time, more than one material should be entered should be a given entry process. Only the inroductions using by making a joke or by a certain pictures can only draw attention of a certain group. Just as done in instruction based on the multiple intelligence theorywhich is made by considering different intelligence types, the instructional diversity should be diversified by considering the students having different attention and meditation level. Attention and meditation levels can be seen in a fragile and changeable structure for short terms, and the order depending on the presentation type. Considering

the differences in this context, it can be interpreted that introductions considering those differences will be much more healthier.

In this context, the following suggestions can be made for subsequent studies. First of all, it can be said that, when determining the sample for such studies, it is possible to choose participants selectively by using two or three filters and some unique features, which may lead to more reliable and satisfactory results in terms of operation. Secondly, more consistent data can be measured using longer periods of time while attention and meditation levels are measured. Short-term measurements may both be measuring selective attention or actually be measuring something distracting. Measurements to be made in the long run may, on average, give a clue to the individual's concentration level. Thirdly, in studies regarding attention, particularly in studies having less participans, consideration of the intervals related with the decrease or increase levels of attention and meditation will lead to more healthy interpretations.

The introduction of simple, low-cost, portable EEG monitoring devices to the market in recent times makes it possible to take this technology from the laboratories to schools. It is possible with today's devices to obtain data of attention and meditation levels of people as well as regarding cognitive processes with appropriate algorithms. The Neurosky brainwave EEG device and an application that transforms brain waves into attention and meditation levels can now easily measure the frequencies of attention and meditation levels via brain waves. As a result, the ability to record longitudinal EEG data in authentic school settings is important for a number of reasons. First, learning with intervals rather than only short-term memory effects can be analyzed longer than in a laboratory experiment. Secondly, the more intrusive behavior in unusual laboratory settings, under intense adult supervision, can be explored more extensively, resulting from the "in vivo" (behavioral and experiential) behaviors of children. Third, we can get a lot of data in EEG; so that the effects of different forms of education and practice can be analyzed. Finally, the longitudinal recording of EEG data on a school-based education offers the opportunity to obtain sufficient data to develop valid teaching models and to apply sufficient results to result in better learning of them (Chang, Nelson, Pant, Mostow, 2013). In this context, similar studies using different sample and experiment designs may contribute to the writing of the field.

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