



## **ETHICS AND SAFETY UNIT IN THE CONTEXT OF MULTIPLE INTELLIGENCE THEORY**

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### **ABSTRACT**

*This study aims to find out whether there is a significant difference between multiple intelligence theory-based teaching method and traditional teaching method, on 5<sup>th</sup> grade of middle school students' achievement level and their attitudes towards the Information and Communication Technologies course in "Ethics and Safety" unit. As a design of the study pre-test and post-test-controlled group design was used. The study was carried out in a middle school located in the city centre in Karaman, Turkey. In the research, two classes, which were chosen randomly, were used as an experimental and a control group. The data was collected through Achievement Test, Information and Communication Course Attitude Scale. The data in the research were analysed by using statistical programme. In order to determine if there is a significant difference between the experimental and control groups, independent samples t test and to determine whether there is a significant difference between the pre-test and post-test scores of the groups within themselves, paired samples t test was used. At the end of the study, significant difference was found in the comprehension levels between the experimental group and the control group. Pretest and post test results of both groups showed that there is a significant difference between them in terms of achievement scores. On the other hand, according to the study results it is observed that there is no significant difference between the groups in terms of attitude pretest scores, but it was seen that attitude post test results of experimental group has increased significantly when compared to the control group.*

**Keywords:** Multiple Intelligence Theory, Information and Communication Technologies, Ethics and Safety

### **INTRODUCTION**

Providing better education means considering individual differences. Students differ from each other in natural abilities, interests, talents, and desires towards learning, upbringing processes in the family, economic status, ethnicity, gender, and many other similar situations. It does not matter whether these differences are congenital or acquired. The important point is that education will not bring the expected result without taking these differences into account (MEB, 2017). Many opinions have been put forward about how a learning process in which individual differences are considered should be in educational environments. Within this context, the Theory of Multiple Intelligences stands out because it draws attention to individual differences and focuses on revealing the potentials of the individual and developing them in the best way. Gardner (1989) defines intelligence broadly as "the capacity to solve problems or fashion products that are valued in one or more cultural setting and to solve the problems that are faced in daily or professional life effectively and efficiently." According to Gardner individuals do not have the same thinking style. If education takes differences into account, it must strive to serve all individuals in the most effective way. If individuals recognize their intelligence combinations, they can be more effective to solve the problems they will face. (Talu, 1999)

Gardner, recognizing the limitations of traditional views about human intelligence, claimed that human beings have at least seven basic intelligence domains in his work of *Frames of Mind* which was published in 1983. By describing the seven intelligence domains, Gardner points out that this number is not capable of expressing of multiplicity of human abilities and adds that there may always be more areas of intelligence too. In a conversation with Gardner Checkley stated that, Gardner mentioned the existence of eighth intelligence and he reframed the Theory of Multiple Intelligence covering these eight domains of intelligence in his book "*Intelligence Reframed*" published in 1999. The eight types of intelligence areas suggested by Gardner are:

- Linguistic
- Logical-Mathematical
- Spatial
- Musical
- Bodily-Kinaesthetic
- Interpersonal
- Intrapersonal



- Naturalist

Multiple Intelligence Theory started to increase its effect especially in the 1990s and brought a multiple perspective to the theory of intelligence by devastating the classical intelligence understanding. With the Theory of Multiple Intelligence, individuals began to be perceived as different from each other, not as smart, intelligent, or incapable. This descriptive change, which seems simple, will deeply affect the preparation process of educational environments (Bümen, 2004). Researching the ways to contribute to the learning of a student who has difficulty perceiving any subject is one of the most important and the hardest aspects of teaching. The question "How can I contribute to my students learning?" is the basic one that the Theory of Multiple Intelligence tries to answer. The Theory of Multiple Intelligence tries to determine the intelligence areas of the students by answering this question. Armstrong (1994) mentioned the existence of a map that includes every individual learning way by dividing the intelligence of students into eight different parts with the help of multiple intelligence theory and stated that there is a project that will enable children to be successful in school or life.

As well as they are different from each other in terms of physical appearances, individuals differ from each other in terms of their cognitive and affective behaviours. When educational activities can reach to individuals who have different qualities, they can be successful. And this can be realized with contemporary student-centred educational approaches (Akamca and Hamurcu, 2005). Implementation of Theory of Multiple Intelligence in schools does not mean that every problem in learning and teaching environment will be solved. However, accepting that human intelligence is different from each other and reflecting this on education programs in all aspects is a real revolution. If Theory of Multiple Intelligence is put into practice somehow, it has a substructure that can reveal and develop many aspects of our children that even we do not know. In a sense, this is a significant step towards ensuring equal opportunity in the education and teaching environment (Kılıç, 2002). Kaptan (1999) pointed out that the Theory of Multiple Intelligence provides two important benefits as follows;

- It allows more effective planning of education programs in order to bring students to desired situations,
- It provides to reach more students who are trying to learn important theories and topics in different disciplines.

The Ministry of National Education's (MoNE) implementation of a curriculum suitable for the theory of multiple intelligences in primary schools, abandoning current teacher-centered teaching methods and adopting student-centered ones and widespread perception that students are not standardized ones means that the effectiveness of individual differences on student achievement is of great importance. (Serin 2005). Using the Theory of Multiple Intelligences in the educational environment plays an important role in creating an active learning process for the teacher. Since diversity is essential in a learning environment prepared according to the Theory of Multiple Intelligences, appealing to every student is the main principle. There is no single way of using this theory in learning process. Appropriate methods can be chosen by the teacher (Armstrong 1994). Planning of the activities can also be in this direction. Therefore, it can be said that the more the activities and materials appeal to different intelligent types, the better and the more permanent learning will be.

It is inevitable to use the technology in classrooms in order to appeal to students' different intelligence types. The use of technology directly affected physical environments in schools. In the early years when technology became widespread, whiteboards instead of chalkboards, overhead projectors, later projection devices and finally smart boards within the scope of FATİH project took their places. With the widespread use of technological devices, teachers visualized their lessons by transferring them to the computers and made them auditory by adding sound files to the educational materials they prepared. Moreover, in order to motivate students and ensure permanence in learning, interactive materials that will appeal to their different intelligence types started to be used by teachers.

Along with contributing to the teaching environment, technological improvements bring ethic and safety concepts that should carefully be considered. Ethics is a concept that explains what is good and right, what is bad and wrong in terms of morality, and questions the necessity of living morally and virtuously (Kayak, 2010). With the development of technology and resources becoming easily accessible, ethic has become a widely used concept in all areas. In this context, concepts such as computer ethics, informatics ethics and internet ethics are now the subject of school curricula (Torun, 2017). Computer ethics consists of policies developed for the ethical use of computer technologies (Moor, 1985). Internet ethics, on the other hand, is defined by some authors in the literature as etiquette to be followed in the cyber world (Fox, 2003; Odabaşı, 2006). On the other hand, internet ethics emphasizes how people should behave while on the internet (Kuiper, Terweland Wolman, 2005). Internet ethics, which has become an important concept with the use of web by increasing numbers of children and young people with technological developments in schools, is a concept that includes copyright, plagiarism, privacy and safety issues (Torun, 2017).

Ethics and safety are concepts that have been emphasized by the MoNE recently. With the public mandate named 'Internet Ethics' published in 2004, the issues that students and teachers should pay attention in the internet environment were declared. Starting to use the internet in company with a family or teacher, not sharing any personal information, using Turkish appropriately on the internet and complying with the rules of courtesy, not buying anything from the internet without



asking the family not giving card information are some of the ethical and safety issues (MEB, 2004). Within this context, functions related to ethics and safety issues have been added to the curriculum of the courses, especially the Information and Communication Course.

### **Problem Statement**

Does the teaching method which is based on Multiple Intelligence Theory in “Ethics and Safety” unit of Information Technology course in 5<sup>th</sup> grades has a significant effect on students’ achievement and attitude scores?

### **Sub-Problems**

1. Is there any significant difference between the achievement levels about “Ethics and Safety” unit of the experimental group students who were instructed according to multiple intelligence theory and the control group students who were instructed by traditional teaching method?
  - a) Is there any significant difference between the scores of pre-test and post-test in terms of achievement levels of the experimental group students who were instructed by multiple intelligence theory?
  - b) Is there any significant difference between the scores of pre-test and post-test in terms of achievement levels of the control group students who were instructed by traditional teaching method?
2. Is there any significant difference between the attitudes towards the Information Technologies and Software class of the experimental group students who were instructed by multiple intelligence theory and the control group students who were instructed by using traditional teaching method?
  - a) Is there any significant difference between the scores of pre-test and post-test about the attitudes towards the Information Technologies and Software course of the experimental group students who were instructed by multiple intelligence theory?
  - b) Is there any significant difference between the scores of pre-test and post-test about the attitudes towards the Information Technologies and Software class of the control group students who were instructed by traditional education method?

### **Purpose and Significance of the Study**

In our last education programme that the Ministry of National Education published, it is clearly stated that the way of a good education is to consider individual differences and pointed out that the education that will be done without considering these differences will not end up in the expected way (MEB, 2017). As a method that considers the individual differences, Multiple Intelligence Theory-Based Teaching Method has added a different dimension to education environments within this period. In this study, it is aimed to find out whether there is a significant difference between multiple intelligence theory-based teaching method and traditional teaching method, on 5<sup>th</sup> grade of middle school students’ achievement level and their attitudes towards the Information and Communication Technologies course about “Ethics and Safety” unit.

### **METHODOLOGY**

Detailed information on research design, study sample, data collection procedure and analysis is provided in the following parts of this chapter.

### **Research Design**

In the research, pre-test and post-test-controlled group design is used. Since the participants are tested in terms of the dependent variables before and after the experimental process, this is a correlated design. The research was carried out on two groups. Groups are determined considering the similar features of the experimental and control groups by researcher, but which one is experimental, and which one is control is randomly determined.

The independent variable whose effect on experimental group was examined is Multiple Intelligence Theory-based learning. In control group, a traditional education-based approach is followed, in other words; any variable that can affect the measured features either positive or negative on this group is not used. Same dependent variables (achievement and attitude) were observed, and comparisons were made both between and within the groups by using pre-test and post-test scores.



Groups	Pre-Tests	Teaching Method	Duration	Post-Tests
Control (N=22)	Achievement Test	Traditional Teaching Method	5 Weeks	Achievement Test
	Attitude Scale			Attitude Scale
Experimental (N=22)	Achievement Test	Multiple Intelligence Based Teaching Method	5 Weeks	Achievement Test
	Attitude Scale			Attitude Scale

### Study Sample

Research was carried out in a middle school located in the city centre in Karaman. In the research, two classes which were chosen randomly method were used as experimental and control group. 5<sup>th</sup> grade students' school reports from the last term were compared and there was no significant difference between the grade point averages of 5/A and 5/B classes. Besides, a pre-test was applied to both groups and there was no significant difference between the pre-test scores of the groups, as well. 5-A class is assigned as a control group, and 5-B class is assigned as an experimental group randomly. There are 24 students in both classes. However, students who did not respond to any of the scales and were missing in one of the pre-tests and post-tests were not included in the sample. So, 44 students, 22 students from each group were included in the sample of the study.

### Data Collection Tools

#### Achievement Test

In the study, an achievement Test was developed in order to measure to what extent 5th grade of middle school students gained behaviour in the "Ethics and Safety" unit. 9 learning outcomes that take part in our education programme (MEB, 2017) were examined and they were decided as targeted functions. The learning outcomes about the unit were stated as targeted functions and 20 questions in total were formed to examine whether these learning outcomes gained or not. The formed questions examined by 7 teachers. A multiple-choice academic achievement test consisting of 20 questions and 4 options was prepared by making necessary corrections according to expert opinions. Achievement Test was applied twice to experimental and control group as a pre-test and a post-test. In the test, correct answers that students gave were qualified as 5 points, and wrong answers were qualified as 0 point. The highest score that can be achieved from the test is 100, and the lowest score is 0.

#### Information and Communication Course Attitude Scale

In the research, an attitude scale taken from Teachers Book of MoNE, and transcribed to Information and Communication Technologies Course was used. This scale is 5-point Likert type consisting 20 items. Students are asked for choosing among Strongly agree – Agree - Neither agree nor disagree – Disagree and Strongly disagree options for each item according to which is more suitable to them. The options were pointed as Strongly agree option is 5 points, Agree option is 4 points, Neither agree nor disagree option is 3 points, Disagree option is 2 points, and Strongly disagree option is 1 point. The lowest score that can be taken from the attitude scale is 20, and the highest score is 100. The attitude scale was implemented to experimental and control groups as both pre-test and post-test.

### Data Analysis

The data in the research were analysed by using statistical programme. The significance level in the research was determined to be taken as 0.5. In order to determine if there is a significant difference between the experimental group students to which Multiple Intelligence Theory-based teaching method is applied and the control group students to which traditional education method is applied in terms of achievement levels and attitudes towards Information and Communication Course the "t" test is employed in statistical program. In order to determine if there is a difference between the experimental and control groups, independent samples t test and to determine whether there is a significant difference between the pre-test and post-test scores of the groups within themselves, paired samples t test was used.

**FINDINGS AND DISCUSSION**

In this part of the research, the data obtained from assessment instruments, which were applied to experimental group and control group in order to determine the impact of the Multiple Intelligence Theory Based Teaching Method, has been analyzed with statistical techniques. The findings obtained from analysis has been summarized in tables and interpreted according to the analysis results.

**Comparison of Achievement Pretest Scores of Experimental and Control Groups**

Achievement test was applied to the control and experimental group students as a pretest before starting to the “Ethic and Safety” unit. The scores obtained from the independent samples t test are presented in Table 1 as follows;

**Table 1: Independent samples t test scores of groups in achievement pre test**

Groups	N	X	SS	t	p
Control	22	35,22	10,96	,586	,561
Experimental	22	33,41	9,56		

As it is seen in Table 1, while the mean score in achievement pretest of control group is 35,22 ; experimental group score is 33,41. As a result of the independent samples t test, there is no meaningful difference between groups (  $p > 0,05$  ). It can be said that both groups are equal in terms of achievement pre test results.

**Comparison of Attitude Scale Pretest Scores of Experimental and Control Groups**

Information Technologies and Software Course attitude scale was applied to the control and experimental group students as a pretest before starting to the “Ethic and Safety” unit. The scores obtained from the independent samples t test are presented in Table 2 as follows;

**Table 2: Independent samples t test scores of groups in attitude scale pretest**

Groups	N	X	SS	t	p
Control	22	53,86	11,33	,-426	,672
Experimental	22	55,45	13,35		

As it is seen in Table 2, while the mean score in attitude pretest of control group is 53,86; mean score of experimental group is 55,45. As a result of the independent samples t test, it can be said that there is no meaningful difference between groups (  $p > 0,05$  ). So, both groups are equal in terms of attitude pre test results.

**Comparison of Achievement Post Test Scores of Experimental and Control Groups**

“Ethic and Safety” unit was instructed to experimental group by using Multiple Intelligence Theory Based Teaching Method. On the other hand, the control group was instructed to traditional teaching methods. Afterwards, achievement test was applied to the groups as a post test. The scores of experimental and control group obtained from the independent samples t test are presented in Table 3 as follows;

**Table 3: Independent samples t test scores of groups in achievement post test**

Groups	N	X	SS	t	p
Control	22	53,86	13,79	-3,318	,002*
Experimental	22	66,36	11,03		

As it is seen in Table 3, while the mean score in achievement post test of control group is 53,86; experimental group score is 66,36. As a result of the independent samples t test, there is a meaningful difference between groups (  $p < 0,05$  ). So, it can

be said that the experimental group students who were instructed by Multiple Intelligence Theory Based Teaching Method are more successful than the control group students who were instructed by traditional teaching methods.

**Comparison of Attitude Scale Post Test Scores of Experimental and Control Groups**

“Ethic and Safety” unit was instructed to experimental group by using Multiple Intelligence Theory Based Teaching Method. On the other hand, the control group was instructed by traditional teaching methods. Afterwards, attitude scale was applied to the groups as a post test. The scores of experimental and control group obtained from the independent sample t test are presented in Table 4 as follows;

**Table 4: Independent samples t test scores of groups in attitude scale post test**

Groups	N	X	SS	t	p
Control	22	57,27	12,97	-5,071	,000*
Experimental	22	76,81	12,58		

As it is seen in Table 4, while the mean score in attitude posttest of control group is 57,27; experimental group score is 76,81. As a result of the independent samples t test, there is a meaningful difference between groups ( $p < 0,05$ ). So, it can be said that experimental group students’ attitudes towards the lesson are significantly developed in a positive way when compared with the control group.

**Comparison of Achievement Pre Test- Post Test Scores of Control Group**

The achievement test was applied to the control group students as a pre-test and post test. Paired samples t test was used to determine whether there is a significant difference between the pre test and post test scores. The scores obtained from the paired samples t test are presented in Table 5 as follows;

**Table 5: Paired samples t test scores of control group in achievement pre test and post test**

Group	Test	N	X	SS	t	p
Control	Post Test	22	53,86	13,79	12,02	,000*
	Pre Test	22	35,22	10,96		

As it is seen in Table 5, while the mean score in achievement post test of control group is 53,86; the mean score in achievement pre test is 35,22. As a result of the paired samples t test, there is a significant difference between the mean scores of two tests ( $p < 0,05$ ). So, it can be said that there is a significant difference between the pre-test and the post test scores of the control group students in terms of achievement levels in favor of the post test.

**Comparison of Achievement Pre Test- Post Test Scores of Experimental Group**

The achievement test was applied to the experimental group students as a pre-test and post test. Paired samples t test was used to determine whether there is a significant difference between the pre test and post test scores. The scores obtained from the paired samples t test are presented in Table 6 as follows:

**Table 6: Paired samples t test scores of experimental group in achievement pre test and post test**

Group	Test	N	X	SS	t	p
Experimental	Post test	22	66,36	11,03	36,19	,000*
	Pre test	22	33,41	9,56		

As it is seen in Table 6, while the mean score in achievement post test of experimental group is 66,36; the mean score in achievement pre test is 33,41. As a result of the paired samples t test, there is a significant difference between the mean

scores of two tests ( $p < 0,05$ ). So, it can be said that there is a significant difference between the pre-test and the post test scores of the experimental group students in terms of achievement levels in favor of post test.

**Comparison of Attitude Scale Pre Test- Post Test Scores of Control Group**

The attitude scale was applied to the control group students as a pre-test and post test. Paired samples t test was used to determine whether there is a significant difference between the pre test and post test scores. The scores obtained from the paired samples t test are presented in Table 7 as follows;

**Table 7: Paired samples t test scores of control group in attitude scale pre test and post test**

Group	Test	N	X	SS	t	p
Control	Post Test	22	57,27	12,97	1,52	,143
	Pre Test	22	53,86	11,33		

As it is seen in Table 7, while the mean score in attitude posttest of control group is 57,27; the mean score in achievement pretest is 53,86. As a result of the paired samples t test, there is no significant difference between the mean scores of two tests ( $p > 0,05$ ). So, it can be said that there is no significant difference between the pre-test and the post test scores of the control group students in terms of student attitudes.

**Comparison of Attitude Scale Pre-Test- Post Test Scores of Experimental Group**

The attitude scale was applied to the experimental group students as a pre-test and posttest. Paired samples t test was used to determine whether there is a significant difference between the pretest and post test scores. The scores obtained from the paired samples t test are presented in Table 8 as follows;

**Table 8: Paired samples t test scores of experimental groups in attitude scale pre-test and post test**

Group	Test	N	X	SS	t	p
Experimental	Post Test	22	76,81	12,58	8,23	,000*
	Pre Test	22	55,45	13,35		

As it is seen in Table 8, while the mean score in attitude posttest of experimental group is 76,81; the mean score in attitude pretest is 55,45. As a result of the paired samples t test, there is a significant difference between the mean scores of two tests ( $p < 0,05$ ). So, it can be said that there is a significant difference between the pre-test and the post test scores of the experimental group students in terms of achievement levels in favor of posttest.

**CONCLUSION AND RECOMMENDATIONS**

At the end of the research, significant difference was found in the comprehension levels between the experimental group, to which the Multiple Intelligence Theory Based Teaching Method was applied and the control group, to which the traditional education method was applied. Considering the mean sores, it can be said that this difference is in favor of the experimental group. Pretest and post test results of both groups showed that there is a significant difference between them in terms of achievement scores; however, the experimental group’s achievement score increase is much greater than the control group. All in all, it can be said that Multiple Intelligence Theory Based Teaching Method increases the student’s success in comparison to the traditional education method. This data supports the finding of the research which was done to analyze the Multiple Intelligence Theory Based Teaching effect on student’s success. (Özdemir vd. 2006; Uçak 2006; Akamca and Hamurcu 2005).

While the experimental group’s attitude increased significantly towards the lesson following the experimental process, the controlling group’s attitude did not change significantly. On the other hand, according to the study results it is observed that there is no significant difference between the groups in terms of attitude pretest scores, but it was seen that attitude post test results of experimental group has increased significantly when compared to the control group. This data supports the finding

of the research which was done to analyze the Multiple Intelligence Theory Based Teaching effect on student's attitude (Korkmaz 2001; Uçak 2006).

According to the study results, overall evaluations can be made as follows;

- In Ethics and Safety Unit of Information and Communication Technology Course, in terms of students' achievement level and their attitude towards the lesson there is a significant difference between two groups in favor of experimental group, to which Multiple Intelligence Theory Based Teaching Method was applied.

-When the results of this study and the results of other studies about Multiple Intelligence is considered, it can be said that using Multiple Intelligence Theory Based Teaching Method in teaching and learning environment, makes lessons more enjoyable and comprehensible by focusing on the individual differences.

- It can also be said that Multiple Intelligence Theory Based Teaching makes lessons more enjoyable and entertaining.

Multiple Intelligence Theory has an important role in today's world, where individual differences are taken into consideration, the student-centered teaching methods are adopted, learning by doing environment is set, and the ways of getting the information are taught instead of providing it directly. All in all, it is thought that preparing teaching- learning environments in which students' individual differences are taken into consideration can increase students' success and motivation.

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