# THE EXAMINATION OF TEACHER VIEWS ABOUT VARIOUS FACTORS RELATED TO APPLICABILITY OF THE MULTIPLE INTELLIGENCE THEORY IN PRIMARY SCHOOLS

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**Abstract:** The purpose of this study was to examine the views of primary school teachers about the applicability of the multiple intelligence theory based on variation of gender, educational status, seniority and place of duty. This study is a mixed methodical examination that use quantitative and qualitative research methods together in the scanning model. The universe of the study consists of primary-school teachers who work at public primary schools in the province of Diyarbakır in 2015-2016 academic year. The sample consists of 100 village, 100 district, and 100 urban center, and a total of 300 primary-school teachers in the province of Diyarbakır for the quantitative dimension; and 5 village, 5 district, and 5 urban center, and a total of 15 primary-school teachers in the province of Diyarbakır for the qualitative dimension. A survey form was used to collect quantitative data for the present study, while semi-structured interview form was used as data collection tool in the qualitative dimension. Study results demonstrated that primary-school teachers had positive viewson the applicability of the multiple intelligence theory in general.
**Keywords:** Multiple Intelligence Theory, Views of Teachers, Intelligence

## INTRODUCTION

Issues such as the formation of thought, how and through which mechanisms human behavior is formed in the brain, how cognitive processes such as learning, perception, decision making, keeping in memory, problem solving, communication, creativity, intuition developed occupied the minds of philosophers and scientists throughout history and several studies have been conducted over time to find responses to these questions. Specialists that researched the mind determined that the abovementioned cognitive processes are the main components of intelligence and their sum constitutes the intelligence (Pfeifer and Scheier, 2001).

Although intelligence is an abstract concept, it has been always the focus of curiosity as mentioned above. Definitions of intelligence demonstrate traces of different scientific approaches as well as a common ground. Certain definitions of intelligence could be summarized as follows:

Avicenna argued that intelligence emerges by learning provided by both the learning process and the knowledge created by perceptions originating from the external world (Selçuk et al., 2004). On the other hand, Wechsler defined intelligence as the individual's ability for expedient behavior, rational thinking and active interaction with the environment (Özgüven, 1994).

Spearman (1927), who claimed that intelligence, was not dependent on one factor, believed that intelligence was based on two factors; "g" factor related to general abilities and "s" factor related to special abilities. On the other hand, Thurston stated that intelligence consisted of seven elements: (a) numerical problem solving, (b) verbal comprehension, (c) memory, (d) general reasoning, (e) verbal fluency, (f) visualization of figurative relations, and (g) perceptive speed (Gleitman, 1987). According to another proponent of multi-factor intelligence Guilford, intelligence has three faces; (a) cognitive operations (thinking processes), (b) content (things we think about), and (c) product (outcomes of thought). These faces divide into categories, creating 180 combinations of intelligence (Açıkgöz, 2008).

A significant portion of intelligence studies consists of intelligence tests. It was not possible to observe intelligence determined by the interaction between environmental factors and the gene pool. To measure intelligence, auxiliary tools, in other words "intelligence tests" were needed and several intelligence tests were developed (Demirel et al., 2006).

Upon request of French education minister, psychologist Binet, in cooperation with his colleague Theodore Simon, developed the intelligence test called intelligence quotient (IQ) in early 1900's to determine the children under risk. This test was found quite effective for the determined purpose; however, later on it was expanded beyond the original goal and became a psychometric scale used to measure general capacities or intelligence of individuals (Bümen, 2005).

Due to this conventional approach related to intelligence and "IQ-style thinking," individuals were divided into two categories: (1) intelligent individuals and (2) unintelligent individuals. IQ tests became the only criterion to determine whether an individual is considered among intelligent ones or not. In other words, IQ has become the only and constant determinant for the intelligence of an individual. Furthermore, according to conventional approach, individuals are either intelligent by birth or not and there is nothing that can be done to change this fact (Saban, 2005).

Although intelligence tests have been used for a long period of time, recently intelligence tests are widely criticized. The critics usually focus on the facts that intelligence tests ignore cultural differences, inappropriate implementation of these tests, lack of validity and reliability studies, and use of test results for diagnosis and selection purposes, not to help the students, and the existence of several cognitive abilities that are not measured by intelligence tests (Açıkgöz, 2008). Thus, material used in intelligence tests include usually numerical, verbal, form-space content. It could be argued that numerical material have a universal structure across all cultures. However, symbols and concepts utilized in verbal section differentiate among cultures. Forms could be perceived differently as well. Thus, implementation of intelligence tests designed for a particular culture in others could create negative outcomes. It seems like developing an intelligence test that eliminated intercultural differences is rather difficult (Ülgen, 1997).

Intelligence tests developed from early 1900's up to 1980's have been utilized in several fields (education, health, etc.). However, starting from 1980's, multiple intelligence theory suggested by Prof. Howard Gardner in his book Frames of Mind marked a new epoch in intelligence studies.

The theory proposed by Howard Gardner in 1983 made conventional intelligence tests and definition of intelligence that takes only language and mathematics intelligence into account and the ever-present effect of intelligence on the society and education a part of the past. Gardner argued that intelligence does not have two but eight dimensions. Thus, he proposed that, not only those who are successful in mathematics and language, but also individuals that are prominent in music, sports, dance, communications, nature and painting and who have self-knowledge were intelligent (Demirel, 2000).

Gardner defines intelligence based on his theory as follows. Intelligence is defined as the ability to shape a product with one or more cultural value or to solve problems. This definition makes intelligence about what individuals do and create in the real world, and this new understanding is just the opposite of the conventional intelligence which is identified via tests. The new understanding is a qualitative expression and definition of individual's collection of intelligence. Whereas, the old understanding was a quantitative expression of a holistic skill (Bümen, 2005).

Gardner argued that conventional intelligence approach had the advantage of facilitating the assessment of the student based on common criteria, however, it did not promote the discovery of the strengths and weaknesses of the student and claimed that intelligence had eight components that operate independent from each other (Başaran, 2004). Eight components of Gardner (1993) mentioned in his intelligence theory were the following: 1) Verbal / linguistic intelligence; 2) Logical / mathematical intelligence; 3) Visual / spatial intelligence; 4) Bodily / kinesthetic intelligence; 5) Musical / rhythmic intelligence; 6) Social / interpersonal intelligence; 7) Intrapersonal / annealing intelligence; and 8) Naturalistic intelligence.

In traditional instruction, it is possible to behave assuming that all students possess developed verbal-linguistic or logical – mathematical intelligence. It is assumed that students could learn it all through activities based on verbal – linguistic and logical – mathematical intelligence such as listening, reading, answering the questions,

explaining, taking notes, doing written or verbal exercises, and problem solving. This fact renders classes unbearable for students whose other intelligence components were developed (e.g., bodily – kinesthetic). Since we possess different cognitive structures, differences in our ways of learning are inevitable. For instance, a subject that normally requires four –five hours of instruction could be taught quite rapidly using figures to visual – spatial students or motions to bodily – kinesthetic students (Açıkgöz, 2008).

According to Gardner (1999), multiple intelligence theory could be applied in schools for three purposes. These are;
- Developing desired skills in students
- Approaching a concept, course subject or a scientific branch using different methods
- Individualization of education.

There is no reason why the schools should not address all multiple intelligence areas. On the contrary, the duty of schools is to improve all intelligence abilities of the students. If any school considers itself void of necessary means to develop all abilities / intelligence types of students, it needs to provide these means from the environment (family, local government, non-governmental organizations) (Baysal et al., 2009). Furthermore, based on the multiple intelligence theory, the objective of education is not merely to improve academic success of the students, but to unravel and develop multiple intelligence potentials in students at the same time (Saban, 2005).

Several studies were conducted to scrutinize the reflections of multiple intelligence theory in primary education. The following could be counted among them:Yenilmez and Bozkurt (2006); Canbay (2006); Erdamar (2009); Yılmaz Kalaycı (2009); Ozan, Taşkın, Bay and Kaya (2010). However, along with the introduction of 12 year compulsory education system, known as 4+4+4, registration of 60 – 66 month old children in school became possible with parent permission and registration of 66 – 80 month old children in school became compulsory. Due to commencement of school life at early ages, Ministry of National Education implemented a change in the curriculum and cancelled 2 hours per week physical education course in primary school 1st, 2nd and 3rd grades and replaced it with five hours per week game and physical activities course. In primary school curriculum, where the system was implemented in 2012 – 2013 academic year and the gradual transformation was completed in 2015 -2016, no studies were conducted about applicability of multiple intelligence. The present study reflects teacher views on applicability of multiple intelligence in primary schools under the light shed by the recent changes in curriculum.

## METHOD

In this section, information concerning the research model, universe, sample and data collection tool that was used in the study and data analysis will be provided.

### Research Model
In the present study that aims to examine teacher views on applicability of multiple intelligence theory in primary education based on various variables, mixed methodology was utilized. Fundamental assumption of mixed method research is to utilize qualitative and quantitative research methods in conjunction to better understand the research problems and questions when compared to using these methods separately (Creswell, 2008). Furthermore, the mixed method provides a selective approach for the researcher in methodology and design to conduct a comprehensive, pluralistic, supplementary research. Several research questions could be completely answered using the solutions provided by the mixed method (Johnson and Onwuegbuzie, 2004). Thus, significant characteristics of the mixed method such as plurality and selectivity could render the mixed method superior when compared to singlemethod designs (Johnson and Christensen, 2004).

In quantitative dimension of the present study, a descriptive survey was conducted Survey methods are research approaches that aim to describe a past or present case as is. The event, individual or the object that is the subject of the study is attempted to be described under its own conditions and as is (Karasar, 2011). In addition, the objective of studies conducted with survey method is generally to take a picture of the existing condition related to the research subject and make a description. To achieve this aim, survey studies usually collect information from a wide audience using the response choices determined by the researcher (Büyüköztürk et al., 2010).

In qualitative dimension of the study, interview technique with open-ended questions was used. Glaser defines qualitative research as an approach that prioritizes investigation and understanding of social events within the environment they belong to with an understanding based on theorization. In this definition "theorization" means

a modelling study that explains a group of previously unknown results based on their interrelations (Cited by Yıldırım and Şimşek, 2008). In addition, the most frequently used qualitative research method is the interview technique. Interview technique is a data collection tool that aims to reveal what individuals think and why, what are their emotions, attitudes and feelings, and the factors that guide their behavior. In brief, it is a scientific tool that aims to enter the mind and heart of the individual (Ekiz, 2009).

**Universe and Sample**
The study was conducted with classroom teachers in Ministry of National Education primary schools in Diyarbakır province during 2015 – 2016 academic year.

"Cluster sampling" method was used in the quantitative dimension of the present study. Cluster sampling is the sampling method where all clusters in the universe have individual selection chances in the sample (Karasar, 2011). The sample included a total of 300 classroom teachers that work in Ministry of National Education primary schools in Diyarbakır province. One hundred of these were working in village primary schools, 100 in townships and 100 were employed in city center primary schools.

In qualitative dimension of the study, purposive sampling was utilized. Researcher could assign information sources directly to obtain most usable information (Kaptan,1998). Thus, the sample included 15 classroom teachers that work in Ministry of National Education primary schools in Diyarbakır province.

**Data Collection Tool**
To collect the quantitative data for the present study that aimed to investigate teacher views on applicability of multiple intelligence theory in primary education, the survey form developed and revised by Canbay (2006) was utilized. The survey form included two sections. In the first section, information on teachers' years in service, gender, educational status, and place of duty is collected. The second section in the form of 5-point Likert-type scale included 20 statements that could be responded as (1) completely disagree, (2) disagree, (3) somehow agree, (4) mostly agree, (5) completely agree. Reliability analysis of the survey was conducted using Cronbach alpha internal consistency coefficient and this figure was found as 0.923. Validity of the scale was established with the approval of two field experts.

To collect qualitative research data, a semi-structured interview form designed by the author was utilized. The data collection tool included four open-ended questions. Teachers were allowed to respond to the questions freely. The interview audio was recorded after permission from the interviewees was obtained. Questions included in the interview were examined by two specialists for clarity, comprehensibility and validity dimensions.

**Data Analysis**
Analysis of quantitative data was conducted with Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics parameters of arithmetic mean and standard deviation were calculated on quantitative data. Homogeneity test (Levene) was applied to determine whether the data was distributed homogeneously. Level of significance for the Levene test applied for this purpose was determined as $p>0.05$. To determine whether there was a significant difference between the groups, independent samples t-test was conducted for the gender variable; one-way analysis of variance was conducted for place of duty, term in office and educational status variables. Conducted analyses were tested in $p<0.05$ level of significance. Scheffe test was applied to determine the source groups and the level of significance found as a result of analysis of variance.

Survey data was interpreted using the scoring that follows: 1.00 – 1.80: completely disagree, 1.81 – 2.60: disagree, 2.61 – 3.40: somehow agree, 3.41 – 4.20: mostly agree, 4.21 – 5.00: completely agree.

Content analysis was used in collected qualitative data in the study. During the analysis, the views of teachers derived from their answers were coded. After the coding process, the data were matched. In the matching process, codes were associated to form sub-themes and each sub-theme was grouped under the themes.

## FINDINGS

Arithmetic mean and standard deviation data on teacher views about applicability of multiple intelligence theory in primary education are presented in Table 1.

**Table 1. Arithmetic mean and standard deviation values forteacher views on multiple intelligence**

| Items | N | X | Sd |
|---|---|---|---|
| **1.**I have adequate knowledge on multiple intelligence theory | 300 | 3,50 | ,89 |
| **2.**I search for research and developments on multiple intelligence theory using Internet or written resources | 300 | 3,09 | 1,19 |
| **3.**New curriculum and textbooks are suitable for instruction based on multiple intelligence theory | 300 | 3,21 | ,98 |
| **4.**All intelligence areas are equally important for me in multiple intelligence theory applications | 300 | 3,50 | 1,03 |
| **5.**I try to prepare my syllabus based on multiple intelligence theory | 300 | 3,42 | ,99 |
| **6.**I design activities that would develop all intelligence areas or utilize all intelligence areas when presenting material | 300 | 3,37 | 1,00 |
| **7.**I think instruction based on multiple intelligence theory gives better results when compared to conventional methods | 300 | 3,77 | 1,00 |
| **8.**I implement multiple intelligence theory in all classes | 300 | 3,28 | ,93 |
| **9.**As a result of multiple intelligence theory, each student could feel useful | 300 | 3,76 | ,94 |
| **10.**I take types of intelligence into account during instruction | 300 | 3,66 | ,92 |
| **11.**I think multiple intelligence theory motivates both the teacher and the student and increases communications between teacher and students | 300 | 3,78 | ,96 |
| **12.**Students find multiple intelligence theory based instruction more entertaining and participate in the class more | 300 | 3,71 | ,93 |
| **13.**Students that used to exhibit difficulties in learning showed improvement since I started to utilize multiple intelligence theory based instruction | 300 | 3,53 | ,84 |
| **14.**I believe that multiple intelligence theory applications are more effective on learning retention | 300 | 3,69 | ,92 |
| **15.**I can find material for multiple intelligence theory applications | 300 | 2,77 | ,91 |
| **16.**Assessment of students based on multiple intelligence theory demands more time and effort from the teachers (observation forms, interview notes, etc.) | 300 | 3,64 | ,93 |
| **17.**Parents do the project work that are conducted within the context of multiple intelligence theory applications rather than the students | 300 | 3,34 | 1,00 |
| **18.**I find it difficult to meet the time requirements during multiple intelligence theory based instruction | 300 | 3,57 | ,91 |
| **19.**We experience chaos and much noise during multiple intelligence theory based instruction, especially during group work | 300 | 3,68 | ,89 |
| **20.**Educational environment should be improved to implement multiple intelligence theory  comfortably | 300 | 4,18 | ,83 |
| **Mean Total** | **300** | **3,52** | **,61** |

There were no statements on multiple intelligence that classroom teachers "completely" agreed, "completely" disagreed or disagreed. Classroom teacher views on multiple intelligence theory mean score (X=3.52) demonstrated that the views of teachers on multiple intelligence theory were generally positive. However, responses to item 15, "I can find material for multiple intelligence theory applications" (X= 2.71) showed that teachers experienced difficulties in finding material for multiple intelligence theory applications.
T-test results for teacher views about applicability of multiple intelligence theory in primary education based on gender variable are given in Table 2.

**Table 2 t-test results based on gender variable**

| Gend | N | X | Ss | sd | t | p |
|------|---|---|-----|----|----|---|
| Femal | 139 | 3.49 | .576 | 298 | -.746 | .456 |
| Male | 161 | 3.55 | .639 | | | |

Table 2 demonstrates that there was no significant difference based on gender variable in t-test conducted to determine whether gender variable had a significant effect on views of teachers on multiple intelligence theory($t_{(298)}$= -0.746, p> 0.05). Thus, it could be stated that gender variable had no significant effect on teacher views about applicability of multiple intelligence theory.

One-way analysis of variance results on teacher views about applicability of multiple intelligence theory in primary education based on education status variable are given in Table 3.

**Table 3 Analysis of Variance Results Based on Education Status Variable**

| Education Status | Sum of Squares | Sd | Mean of Squares | F | p |
|------------------|----------------|-----|-----------------|-------|------|
| Between Group | 16.729 | 2 | 8.364 | 26.197 | .000 |
| In-Group | 94.829 | 297 | .319 | | |
| Total | 111.557 | 299 | | | |

Table 3 demonstrates that there was a significant difference based on education status variable in the one-way analysis of variance (Anova) conducted to determine whether education status variable had a significant effect on views of teachers on multiple intelligence theory (F= 26.197, p<0.05). Scheffe supplementary post-hoc test was conducted to determine the source groups for the difference after Anova and a statistically significant difference was found between teachers with a master's degree and undergraduate degree favoring teachers with a master's degree, and between teachers with a doctora teand undergraduate degree favoring teachers with a doctorate degree. The differences between other dub-dimensions were statistically insignificant (p>0.05). Based on these results, it could be stated that teachers with a master's or doctorate degree could implement multiple intelligence theory methods and techniques more when compared to teachers with an undergraduate degree.

One-way analysis of variance results on teacher views about applicability of multiple intelligence theory in primary education based on term in service variable are given in Table 4.

**Table 4 Analysis of Variance Results Based on Term in Service**

| Term in Service | Sum of Squares | Sd | Mean of Squares | F | p |
|-----------------|----------------|-----|-----------------|--------|------|
| Between groups | 16.039 | 4 | 4.010 | 12.384 | .000 |
| In-Group | 95.518 | 295 | .324 | | |
| Total | 111.557 | 299 | | | |

Table 4 demonstrates that there was a significant difference based on term in service variable in the one-way analysis of variance (Anova) conducted to determine whether there was a significant difference between the views of teachers on multiple intelligence theory based on term in service variable (F= 12.384, p<0.05).Scheffe supplementary post-hoc test was conducted to determine the source groups for the difference after Anova and a statistically significant difference was found between teachers who had 1 – 5 years term in service and teachers who had 11 – 15 years, 16 – 20 years and 21 years and over term in service favoring teachers who had 1 – 5 years term in service, between teachers who had 6 – 10 years term in service and teachers who had 16 – 20 years and 21 years and over term in service favoring teachers who had 6 – 10 years term in service.The differences between other dub-dimensions were statistically insignificant (p>0.05). Based on these results, it could be stated that teachers who had 1 – 5 years and 11 – 15 years term in service could implement multiple intelligence theory methods and techniques more when compared to teachers who had 16 – 20 years and 21 years and over term in service.

One-way analysis of variance results on teacher views about applicability of multiple intelligence theory in primary education based on place of duty variable are given in Table 5.

**Table 5 Analysis of Variance Results Based on Term in Service Variable**

| Place of Duty | Sum of Squares | Sd | Mean of Squares | F | p |
|---|---|---|---|---|---|
| Betweengroups | 6.408 | 2 | 3.204 | 9.050 | .000 |
| In-Group | 105.149 | 297 | .354 | | |
| Total | 111.557 | 299 | | | |

Table 5 demonstrates that there was a significant difference based on place of duty variable in the one-way analysis of variance (Anova) conducted to determine whether there was a significant difference between the views of teachers on multiple intelligence theory based on place of duty variable (F= 9.050, p<0.05).Scheffe supplementary post-hoc test was conducted to determine the source groups for the difference after Anova and  a statistically significant difference was found between teachers who worked in the villages and city center, favoring teachers who worked in the villages, and between teachers who worked in the townships and city center, favoring teachers who worked in the townships. The differences between other dub-dimensions were statistically insignificant (p>0.05). Based on these results, it could be stated that teachers who worked in the villages and townships had more positive views on applicability of multiple intelligence theory when compared to teachers who worked in the city center.

Qualitative data were obtained by posing 4 open-ended questions to 15 classroom teachers using the semi-structured interview form in the study. Obtained findings are presented in below tables.

**Question 1:**''*What comes to your mind when you hear multiple intelligence theory?*''
        Participants' responses to Question 1 are presented in Table 6.

**Table 6 Analysis results and frequencies of teachers' responses for Question 1**

| Responses | f | Teachers |
|---|---|---|
| It means more than one areas of intelligence. | 12 | Ö1, Ö2, Ö3, Ö5, Ö6, Ö7, Ö8, Ö9, Ö12, Ö13, Ö14, Ö15 |
| Distinctive intelligence of the individual. | 4 | Ö6, Ö10, Ö14, Ö15 |
| One of the instruction method and techniques used in education. | 3 | Ö4, Ö11, Ö12 |
| It means contemporary intelligence. | 1 | Ö2 |

Table 6 demonstrates that twelve teachers stated that it means more than one intelligence areas(Ö1, Ö2, Ö3, Ö5, Ö6, Ö7, Ö8, Ö9, Ö12, Ö13, Ö14, Ö15), four teachers stated that it means distinctive intelligence of the individual(Ö6,  Ö10,  Ö14,  Ö15), three teachers stated that it is an educational instruction method and technique(Ö4, Ö11, Ö12), and one teacher stated that it means contemporary intelligence(Ö2) in their answers to Question 1. Responses given by certain teachers to this question were as follows:
        *"Multiple intelligence means more than one areas of intelligence"* (Ö15)
        *"It means that there is not one single field of intelligence in each individual, but there are areas of intelligence that change from one individual to another"* (Ö6).

Based on these results, it could be stated that teachers generally had adequate information about multiple intelligence theory.

**Question 2:**''*Do you utilize multiple intelligence theory in your instruction methods and techniques? Can you explain how by giving reasons?*''
        Participants' responses to Question 2 are presented in Table 7.

**Table 7 Analysis results and frequencies of teachers' responses for Question 2**

| | Response | f | Teachers |
|---|---|---|---|
| **YES** | It promotes retention of education - instruction | 8 | Ö1, Ö3, Ö6, Ö7, Ö10, Ö12, Ö13, Ö15 |
| | It reveals students' interests and abilities | 6 | Ö3, Ö5, Ö6, Ö8, Ö13, |
| | It makes classes more entertaining | 3 | Ö4, Ö12, Ö15 |
| | MNE textbooks support multiple intelligence | 2 | Ö7, Ö8 |
| **NO** | Educational environment where multiple intelligence could be implemented is not available. | 2 | Ö2, Ö9 |
| | I do not have sufficient information | 1 | Ö11 |

Table 7 demonstrated that eight teachers stated that they used multiple intelligence theory in their instructional methods and techniques because it promotes retention of education – instruction(Ö1, Ö3, Ö6, Ö7, Ö10, Ö12, Ö13, Ö15), six teachers stated that they used it because it reveals students' interests and abilities(Ö3, Ö5, Ö6, Ö8, Ö13, Ö14), three teachers stated that they used it because it makes classes more fun(Ö4, Ö12, Ö15), and two teachers stated that they used it because Ministry of National Education textbooks supported multiple intelligence(Ö7, Ö8), while two teachers stated that they did not utilized multiple intelligence theorem in their instructional methods and techniques because they were not able to find an educational environment where they could implement it (Ö2, Ö9), and one teacher stated that it couldn't be implemented due to the lack of adequate knowledge (Ö11) in teachers' responses to question 2. Responses given by certain teachers to this question were as follows:

*"Resources permitting, I try to implement it as much as possible. Because, I think the retention of course instructions based on multiple intelligence theory is higher" (Ö15).*

*"The reason why I implement it is the interest students demonstrate and the knowledge is better reinforced" (Ö7).*

Based on these results it could be concluded that teachers utilized multiple intelligence theorem in their instructional methods and techniques because it provides retention in education, reveals the interests and abilities of students, makes classes more entertaining and MNE textbooks support multiple intelligence. Furthermore, among the reasons for teachers' inability to implement multiple intelligence theorem in their instructional methods and techniques, lack of educational – instructional environment suitable for multiple intelligence and lack of teachers' knowledge about multiple intelligence theory could be mentioned.

**Question 3:***''What are the difficulties you experience whike implementing multiple intelligence theory in your methods and techniques?''*

Participants' responses to Question 3 are presented in Table 8.

**Table 8 Analysis results and frequencies of teachers' responses for Question 3**

| Responses | f | Teachers |
|---|---|---|
| There is a shortage of hardware and material | 13 | Ö1, Ö2, Ö3, Ö5, Ö6, Ö7, Ö8, Ö9, Ö10, Ö12, Ö13, Ö14, Ö15 |
| Classroom sizes are quite large | 11 | Ö1, Ö2, Ö4, Ö5, Ö6, Ö7, Ö9, Ö11, Ö13, Ö14, Ö15 |
| Parents do not have adequate knowledge about multiple intelligence | 4 | Ö3, Ö5, Ö13, Ö14 |
| There is too much information in the curriculum | 4 | Ö1, Ö6, Ö8, Ö14 |
| It takes too long to implement | 3 | Ö1, Ö4, Ö15 |
| It is difficult to determine individual intelligence areas | 2 | Ö8, Ö13 |

Table 8 demonstrates that thirteen teachers stated that there was a shortage of hardware and material(Ö1, Ö2, Ö3, Ö5, Ö6, Ö7, Ö8, Ö9, Ö10, Ö12, Ö13, Ö14, Ö15), eleven teachers stated that the classrooms were too

crowded(Ö1, Ö2, Ö4, Ö5, Ö6, Ö7, Ö9, Ö11, Ö13, Ö14, Ö15), four teachers stated that parents did not possess adequate knowledge about multiple intelligence(Ö3, Ö5, Ö13, Ö14), four teachers stated that the implementation took too much time(Ö1, Ö6, Ö8, Ö14), three teachers stated that there was too much information in the curriculum(Ö1, Ö4, Ö15), and two teachers stated that it was difficult to determine individual areas of intelligence(Ö8, Ö13). Responses given by certain teachers to this question were as follows:

*"Primarily, I experience the problem of the material shortage when I implement multiple intelligence in my methods and techniques" (Ö9).*

*"Since the classrooms are too crowded, I experience difficulties in designing an individual activity plan for each student" (Ö13).*

Based on these results, it could be argued that teachers experienced hardware and material shortages while implementing multiple intelligence theory and this made it difficult to implement multiple intelligence theory comprehensively, furthermore, crowded classrooms made it difficult to determine individual intelligence areas of students and due to the lack of parents' knowledge on multiple intelligence theory, they desired the dominance of verbal and mathematical intelligence in their children whether they exist or not, the implementation of the theory took time, thus, decreasing its usability. It could be also claimed that the existence of too much information in the curriculum results in teachers being weary not to be able to finish the subjects in the curriculum, making it difficult for them to utilize this method that takes longer to implement.

**Question 4:** *"what are your suggestions for implementation of multiple intelligence theory in education and instruction?"*

Participants' responses to Question 4 are presented in Table 9.

**Table 9 Analysis results and frequencies of teachers' responses for Question 4**

| Responses | f | Teachers |
|---|---|---|
| Educational environment should be improved (material, hardware, infrastructure, etc.) | 13 | Ö1, Ö2, Ö3, Ö4, Ö5, Ö6, Ö7, Ö8, Ö9, Ö10, Ö13, Ö14, Ö15 |
| Classroom sizes should be reduced | 11 | Ö1, Ö2, Ö3, Ö4, Ö5, Ö6, Ö7, Ö9, Ö11, Ö13, Ö15 |
| Curriculum should be designed suitable for multiple intelligence and it should be extenuated | 7 | Ö1, Ö4, Ö6, Ö8, Ö10, Ö13, Ö14 |
| Teachers should receive applied training for multiple intelligence in college | 5 | Ö2, Ö10, Ö11, Ö12, Ö14 |
| Branch teachers should instruct music, visual arts and physical education courses starting from the 1st grade | 4 | Ö3, Ö7, Ö13, Ö15 |
| Schools should be open outside hours of attendance and mathematical, visual, physical, musical, etc. classes should be initiated | 1 | Ö6 |

Table 9 demonstrates that thirteen teachers stated that educational environment should be improved (material, hardware, infrastructure, etc.)(Ö1, Ö2, Ö3, Ö4, Ö5, Ö6, Ö7, Ö8, Ö9, Ö10, Ö13, Ö14, Ö15), eleven teachers stated that classroom sizes should be reduced (Ö1, Ö2, Ö3, Ö4, Ö5, Ö6, Ö7, Ö9, Ö11, Ö13, Ö15), seven teachers stated that curriculum should be designed based on multiple intelligence and it should be extenuated(Ö1, Ö4, Ö6, Ö8, Ö10, Ö13, Ö14), five teachers stated that teachers should receive applied multiple intelligence training in the college(Ö2, Ö10, Ö11, Ö12, Ö14), four teachers stated that branch teachers should instruct music, visual arts and physical education courses starting from the 1st grade(Ö3, Ö7, Ö13, Ö15), and one teacher stated that schools should be kept open outside hours of attendance and mathematical, visual, physical, musical, etc. Classes should be opened (Ö6). Responses given by certain teachers to this question were as follows:

*"Since retention of visualized subjects is higher, I think projection devices and smart boards in each classroom would benefit greatly" (Ö7).*

*"Primarily, classroom size should be reduced from 40 – 50 pupils to 15 – 20 students" (Ö13).*

Based on these results, to apply multiple intelligence theory, teachers primarily considered it necessary to improve the educational environment and then to reduce the classroom size, to design of the curriculum based on multiple intelligence theory and extenuation of the curriculum, teachers to receive applied multiple intelligence theory training in the college, instruction of music, physical education and visual arts classes by branch teachers starting from the 1$^{st}$ grade in primary schools, and to keep schools open beyond hours of attendance to direct the students to fields such as musical, visual, sportive activities based on their interests and intelligence areas during these periods.

## RESULT, DISCUSSION AND RECOMMENDATIONS

Based on the results of the present study that was conducted to investigate teacher views on applicability of multiple intelligence theory in primary schools, it was observed that gender variable had no effect on teacher views.

Based on the results of the present study, it was observed that teachers with 1 – 5 years and 11 – 15 years in service were able to implement multiple intelligence theory in their instructional methods and techniques better than teachers with 16 – 20 years and 21 years and over in service. This could be due to the fact that Ministry of National Education curriculum was designed based on conventional instruction approach before 2005. Ministry of National Education changed the curriculum in 2005 and designed the new curriculum based on constructivist instruction model. Thus, teachers who started the service before 2005 implement the conventional method in their classes and although the curriculum had changed, they stick to their old habits.

Based on the results of the present study, it was observed that teachers who worked in villages and townships desired to implement multiple intelligence theory in their instructional methods and techniques more when compared to teachers that worked in city center, but they were limited in their utilization of multiple intelligence in their methods and techniques due to material and hardware shortages.

Based on the results of the present study, it was observed that teachers with master's and doctorate degrees implemented multiple intelligence theory in their instructional methods and techniques more when compared to teachers with undergraduate degrees. Thus, it could be argued that master's degree should be imperative for classroom teachers, similar to the Finnish regulations to facilitate the implementation of multiple intelligence theory in instructional methods and techniques by classroom teachers.

Based on the results of the present study, it could be stated that the facts that it promoted retention in education and instruction, revealed interests and abilities of the students and rendered classes more fun could be counted among the reasons why classroom teachers implemented multiple intelligence theory in their instructional methods and techniques.

In the present study, teachers stated that the primary problem they faced while implementing multiple intelligence theory in their instructional methods and techniques was hardware and material shortages. Thus, it is necessary to remove these shortages for classroom teachers to implement multiple intelligence theory in their instructional methods and techniques. In this context, interactive (smart) board application initiated by MNE within Fatih Project, which aims active utilization of IT technologies in educational and instructional activities, could be considered as a sound and good application. Furthermore, teachers stated that it was difficult to determine individual intelligence areas of the students due to the classroom size and there was too much information in the curriculum, leading to an ability to implement multiple intelligence theory in their instructional methods and techniques. Thus, classroom sized should be reduced and the curriculum should be extenuated by removing unnecessary information to enable teachers to implement multiple intelligence theory in their instructional methods and techniques.

Based on the results of the present study, it could be observed that classroom teachers received theoretical training on multiple intelligence theory during their undergraduate education, however, they did not receive applied multiple intelligence theory training. Thus, in addition to theoretical training on multiple intelligence theory during their undergraduate education, teachers should be trained in applied multiple intelligence theory as well.

Based on the results of the present study, following recommendations could be made on applicability of multiple intelligence theory in primary schools:

✓        Hardware and material shortages should be resolved.

✓        Classroom sizes should be reduced.

✓        Student textbooks and activity plans should be designed based on regional differences and by taking environmental conditions into account.

✓        Branch teachers should instruct game and physical education, music education and visual arts education classes starting from the 1$^{st}$ grade.

✓        Teachers should be required to have at least master's degrees to improve academic   knowledge of teachers, similar to the implementation in Finland.

✓        Schools should be open all day long and mathematical, visual, verbal, social, nature, physical and musical classes should be established outside hours of attendance and students should be directed to these classes based on their predominant intelligence areas, these classes should be supported  with courses such as drama, chess, theatre, etc., and love for nature should be inspired to children who never experienced natural life in their lives in the city.

✓        Seminars should be organized to provide information for school administration, teachers, parents and students on multiple intelligence theory and multiple intelligence theory specialists who authored studies in the field should conduct these seminars.

✓        Courses such as musical education, game and physical education, visual arts education and free activities should be instructed in a manner to serve their original objectives.

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