



The Relationship Between Multiple Intelligences and Academic Achievements Of Second Grade Students *

İlköğretim İkinci Kademe Öğrencilerinin Çoklu Zeka Alanları ve Akademik Başarıları Arasındaki İlişki

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Abstract

The aim of this study is to investigate the relation between the multiple intelligences and the academic achievement levels of secondary school students. Relational survey method is used in this study. Participants are 250 students from secondary schools in Izmir, Turkey. Data is collecting by Multiple Intelligence Scale for Students and a questionnaire. Students' first semester accumulative grades are taken as a criteria for academic achievement. Data is analyzed by descriptive statistics. Identifying the multiple intelligences of secondary school students, the differences according to the academic achievement levels of the students will contribute an awareness to the self knowledge and abilities of the students as well as to develop suggestions for programs to enhance their academic achievement levels and to be a reference for further studies.

Keywords: Secondary school, Multiple intelligences, Academic achievement

Özet

Bu çalışmanın amacı ilköğretim ikinci kademe öğrencilerinin çoklu zeka alanları ve akademik başarı düzeyleri arasındaki ilişkinin incelenmesidir. Bu çalışmada ilişkisel tarama yöntemi kullanılmıştır. Katılımcılar İzmir Merkez ilköğretim okullarında okuyan 250 öğrenciden oluşmaktadır. Araştırmanın verileri Selcioğlu (2005) tarafından geliştirilen Öğrenciler İçin Çoklu Zeka Ölçeği ve araştırmacılar tarafından geliştirilen kişisel bilgi formu ile toplanmıştır. Akademik başarı ölçütü olarak öğrencilerin birinci dönem sonu akademik başarı ortalamaları alınmıştır. Veriler betimleyici istatistiksel yöntemlerle analiz edilmiştir. İlköğretim ikinci kademe öğrencilerinin çoklu zeka alanlarının akademik başarı düzeylerine göre nasıl farklılaştığının saptanması, öğrencilerin kendilerine ve yeteneklerine yönelik farkındalık kazanmalarına yardımcı olacak çalışmaların planlanmasında ve onların akademik başarı düzeylerinin artırılması için alınacak önlemlerin belirlenmesinde katkı sağlayacak ve bu konuda yapılacak sonraki araştırmalara ışık tutacaktır.

Anahtar kelimeler: İlköğretim ikinci kademe öğrencileri, Çoklu zeka, Akademik başarı

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Introduction

From birth, all human beings have different abilities and every child has unique properties. Until 1940s, as Rogers stated that children are meritorious because of their inner potentials, creativity, power to learn, ability to learn languages, potential to use brain (Akboy, 2004; Akboy & İkiz, 2007). How children perceive themselves and their educational experiences establish their self concept and also prior to the development of self-efficiency.

A successful transition from childhood to adolescence partially depends upon the academic preparation and the motivation of student as well as the school's effectiveness in helping the student acquire life survival skills. Do the schools use testing, orientation and advising programs to help them take full advantage of the environmental and personal resources necessary for their success? Since every individual has unique set of experiences, a variety of responses to any given stimulus is possible. Learning is essentially an active process that the attention, curiosity and interest of the perceiver often increase. Therefore, provision for individual differences in learning is crucial (Fraenkel, 1994). The special academic and personal characteristics of students and how these characteristics affect their success have to be taken into consideration.

In his theory of multiple intelligences, Gardner (1999) argued that certain intelligences were valued in the schools while others were not. Gardner (1983) claims that intelligence is comprised of multiple modules or types, which are largely independent and functionally separate from each other. To briefly describe these intelligences (Barnard & Olivarez, 2007). Linguistic intelligence generally refers to sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. Bodily, kinesthetic intelligence involves the potential to use one's whole body or parts of the body. Musical intelligence is self-explanatory and consists of skill in the performance, composition and appreciation of music. Intrapersonal intelligence consists of the capacity to understand oneself, to appreciate one's feelings, fears and motivations. Logical-mathematical intelligence entails the capacity to analyze problems logically, carry out mathematical operations and investigate issues. Interpersonal intelligence entails the capacity to understand the intentions, motivations and desires of other people. Spatial intelligence refers to the potential to recognize and use patterns. Naturalistic intelligence refers to the capacity to recognize, categorize and draw upon certain features of the environment. The inclusion of spiritual, existentialist and moral intelligence types creates some problems because, person's spirituality is privileged to the privacy of the human mind and not visible.

Out of these eight multiple intelligences, Gardner (1999) proposed that linguistic and logical-mathematical intelligences are the "coin of the realm", having traditionally dominated intelligence testing and are the ones that have typically been valued in school. Recognizing that students have different strengths and providing activities to accommodate those strengths while bridging to the weaker areas is at the heart of diversified instruction based on multiple intelligences theory (Barnard & Olivarez, 2007). Students are not merely receivers of the given information; they should be

encouraged to construct meaning for themselves. Since, teachers should move from the role of dispensers of knowledge into the role of facilitators of learning (Gullatt, 2008). Therefore during assessment procedure, intelligence types, creativity, problem solving and wisdom should be taken into consideration.

As Gullatt (2008) indicates, scientists have found that most thought occurs on a level well below conscious control and awareness that involves processing of a continual stream of sensory information; abstract thought is represented through metaphors that are associated with physical experiences and emotions; physical sensation and emotions are integral to thought and learning. Thus without sensation and emotion logic may not be possible for some researchers. It is supported that the arts may be used as a means of making meaning of what is learned as well as to synthesize what had been thought in schools (Gullatt 2008; Eisner, 1998; Aprill, 2001), arts subjects are great potential partners in academic learning, arts have impact upon numerous social and cognitive dimensions across many academic disciplines (Gouzouasis et al., 2007). It is explained that there is a relationship between spatial and logical mathematical intelligences, as Gullatt (2008) indicates, as well as a strong relationship between spatial and musical intelligences, besides the literature. It is emphasized that a) in order to make literature meaningful, students must be given aesthetic opportunities; their comprehension of text was increased and motivation for reading was enhanced; b) the more intelligences students were required to use for learning, the deeper their understanding of the content presented.

The second grades clearly bring unique challenges for student learning and adjustment, associated with the major psychological, social and biological changes that impact them (Munoz, Ross & McDonald, 2007). Indeed, the relation between cognitive style and sexual identity was an important research area until 1970's (Lopiccolo & Blatt, 1972). Current research suggest small, stable, and Besides the characteristics of second grade students, researchers support the belief that knowledge can be gained more than one way; as the ability to learn is derived from multiple resources (Gullatt, 2008). The estimates of intelligence have become a key issue in educational assessment. It shows the educational attainment levels of nations. In our society, a problem with teaching and assessing more broadly is that the kinds of standardized assessments we currently use are quite narrow (Sternberg, 2008). Elementary and secondary school curriculum is changed through the effects of multiple intelligences theory and constructivism. Therefore it has to be determined whether the present assessment results in GPA scores of students are in relation with their intelligence type and the other variables affect them. Indeed, in the literature, it is suggested that future research should examine the relationship between school valued intelligences and academic achievement scores through GPA (Barnard & Olivarez, 2007). The purpose of this study is to examine the relationship of academic achievement with multiple intelligence scores of students and the gender effect as well. Results contribute awareness to the self knowledge and self efficacy of the students as well as to develop suggestions for programs to enhance their academic achievement levels and to be a reference for further studies.

Methodology

Participants

Participants are 250 students from secondary schools in Izmir, Turkey. The participants consists 135 girls (%53,6) and 117 boys (46,4%). 106 of them (%42,1) indicate their socioeconomic status as low and 118 (%46,8) of them as middle, 28 of the participants (% 11,1) indicate as high.

Instruments

Multiple Intelligence Scale for Students (MISFS)

This scale was developed by Selcioglu in order to identify the multiple intelligence areas of elementary and secondary school students in 2005. The standardization studies was conducted on 459 students, 231 girls and 228 boys. Firstly established and applied as 80 items, the 5 items with the factor load value under 0.30 was deleted according to item-scale correlation. After retest application, the 11 items with the factor load value under the 0.45 was deleted. So the last form of the scale with 64 items was reestablished. Test-retest reliability quotient was found .86 and Spearman-Brown reliability quotient was found .78. Cronbach alpha value is found as .90. The 3 Likert type scale consists of 64 items to measure multiple intelligence eighty areas of students. As a results of factor analysis, it is reached eight in size and 64 items. There was no reversible items. The multiple intelligence areas that was measured by this scale consisted of Verbal–Linguistic intelligence, Logical–Mathematical intelligence, Spatial-Visual intelligence, Musical intelligence, Body-Kinesthetic intelligence, Interpersonal intelligence, Intrapersonal intelligence, Naturalistic intelligence, each consisted 8 items.

Academic Achievement Assessment

Students first semester accumulative grades will be taken as criteria for academic achievement. Academic Achievement levels are determined according to the classification system of The Ministry of Education. As a result , 9 of the participants (%3,6) has an accumulate 1, means lowest; 47 of them (%18,7) has 2, means low; 92 of them (%36,5) has 3 means middle; 81 of them (% 32,1) has 4, means above middle and 23 of them (% 9,1) has 5, means high.

Data Analyzed

This study of to investigate the relation between the multiple intelligences and the academic achievement levels of secondary school students. Data is analyzed by descriptive statistics, t Test, ANOVA.

Findings

First of all, the multiple intelligence scores of the participants on the subscales of MISFS according to gender are analyzed by t test, given on Table 1.

Table 1. Multiple Intelligences According To Gender, t Test

	Gender	n	\bar{x}	ss	sd	t	p
Verbal -Linguistic	boys	117	18,59	2,65	250	-2,088	,038*
	girls	135	19,30	3,09			
Logical - Mathematical	boys	117	19,74	2,84	250	1,388	,166
	girls	135	19,24	2,84			
Spatial-Visual	boys	117	18,11	2,93	250	1,933	,054
	girls	135	17,40	2,96			
Musical	boys	117	18,65	2,92	250	-3,746	,000**
	girls	135	20,05	2,96			
Body-Kinesthetic	boys	117	19,95	2,56	250	1,811	,071
	girls	135	19,37	2,56			
Interpersonal	boys	117	19,94	3,02	250	-1,522	,129
	girls	135	20,45	2,38			
Intrapersonal	boys	117	19,48	2,13	250	-1,579	,116
	girls	135	19,91	2,11			
Naturalistic	boys	117	18,76	3,18	250	1,453	,147
	girls	135	18,20	2,95			

*P<.05, **p<.001

As seen on Table 1, there are statistically significant differences between the means of the verbal-linguistic intelligence subscale of participants according to gender (t= -2,088, p<.05) and the means of the musical intelligence subscale of participants according to gender (t= -3,746, p<.01).

Secondly, the multiple intelligence scores of the participants on the subscales of MISFS according to academic achievement levels are analyzed by ANOVA, given on Table 2.

Table 2. Multiple Intelligences According To Academic Achievement Levels, ANOVA,

	Academic achievement	Sum of squares	df	Mean square	F	Sig.	Dif.
Verbal - Linguistic	Between groups	211,601	4	52,900	6,783	,000*	1-3
	Within groups	1926,383	247	7,799			1-4
	Total	2137,984	251				1-5
							2-4
							2-5

Logical - Mathematical	Between groups	122,129	4	30,532		1-5
	Within groups	1918,728	247	7,768	3,930 ,004*	2-5
	Total	2040,857	251			
Spatial-Visual	Between groups	79,675	4	19,919		
	Within groups	2125,511	247	8,605	2,315 ,058	
	Total	2205,187	251			
Musical	Between groups	99,747	4	24,937		1-3
	Within groups	2190,967	247	8,870	2,811 ,026*	1-4
	Total	2290,714	251			1-5
Body- Kinesthetic	Between groups	26,065	4	6,516		
	Within groups	1641,793	247	6,647	,980 ,419	
	Total	1667,857	251			
Interpersonal	Between groups	88,389	4	22,097		1-3
	Within groups	1750,607	247	7,087	3,118 ,016*	1-4
	Total	1838,996	251			1-5
Intrapersonal	Between groups	83,086	4	20,771		1-2
	Within groups	1058,343	247	4,285	4,848 ,001*	1-3
	Total	1141,429	251			1-4
Naturalistic	Between groups	38,649	4	9,662		1-5
	Within groups	2324,097	247	9,409	1,027 ,394	
	Total	2362,746	251			

*P<.05

As seen on Table 2, it is found that there are statistically significant differences on multiple intelligence subscale means of the participants according to their academic achievement levels. According to Tukey analyze, the participants who have lowest academic achievement level (Accummulative Grade 1) have lower verbal-linguistic ability than the students who have middle and over academic achievement level; who have low academic achievement level have lower verbal linguistic ability then the students whose academic achievement levels are over middle and high. The participants who have low academic achievement level have lower logical-mathematical ability than the students who have high academic achievement level. The participants, who have lowest academic achievement level, have lower interpersonal and intrapersonal ability than the others.

Discussion and Conclusion

Cognitive research shows that boys and girls perform differently on some types of mathematical tests, indeed there is biological differences in the sexes. In general boys are born with an interest in figuring out how system works, while girls naturally focus more on understanding the mental state of others. In contrast, some researchers say little about innate gender differences that children spent years in the sea of cultural and academic stimuli that can influence their performance (Monastersky, 2005).

According to the results of this study, it is found that gender is found to be effective on multiple intelligences. That is, girls have higher scores than boys on the verbal-linguistic ability and the musical ability. Actually the gender differences on multiple intelligences had been investigated and an important research area in the literature. An extensive body of literature reports that significant sex differences do exist in the self-estimation of multiple intelligences, which are parallel to the results of this study, and g factor intelligence (Furnham & Akande, 2004, Furnham & Chamorro-Premuzic, 2005; Furnham et al., 2002; Furnham & Mottabu, 2004, Barnard & Olivarez, 2007); however some indicate that there are no significant gender differences on the subscale level or from examining the total multiple intelligences score. Additionally, there were no significant gender differences in estimates of school valued intelligence as a total score composite of logical mathematical and linguistic intelligences (Barnard & Olivarez, 2007).

Neto et al. (2008) investigated the relationship among sex, attitude toward intelligence and self-estimation of multiple intelligences for self and parents among adolescents in secondary schools. As indicated in this study, males rated themselves higher on overall, mathematical, spatial, intrapersonal, spiritual and naturalistic IQ compared with females. Multiple regressions indicated that verbal, logical and intrapersonal intelligence were significant predictors for self and parents overall IQ estimations.

In this research, academic achievement scores are found to be effective on students multiple intelligences. It is found that the student who have lower academic achievement level, have lower verbal-linguistic ability, have lower logical-mathematical ability and have lower interpersonal and intrapersonal ability than the others. This result supports the notion that these abilities are school valued ones. Self-estimations of intelligence can have a self-fulfilling nature, thus influencing the academic success of students (Furnham, 2000), students who overestimate their intelligence may not develop the strategies and other skills needed to learn because they do not perceive the need to plan and monitor their activities (Barnard & Olivarez, 2007). Likewise, students who underestimate their intelligence may not take initiative in the academic domain, considering themselves less able to begin with.

The relation found between musical intelligence and the academic achievement scores are similar to the other empirical studies (Butzlaff, 2000; Vaughn, 2000; Demirsöz Selcioglu & Kocabaş, 2006; Çongur Yeşilkaya, 2006, Kaptan-Aykaç, 2006; Gouzouasis, et al, 2007) and support the conclusion that students involved in music are "doing better than those who are not". The result supports the

notion that students who feel they are achieving positively in music may have more positive attitudes toward learning in general (Gouzouasis, et al, 2007); music instruction leads to academic achievement (Costa-Giomi, 1999) and on the type of music instruction, skills learned in a music context are transferable to the other context (Rausher, 2003). There is now experimental evidence that involvement in musical activities increases students' self-esteem (Costa-Giomi, 2004) and social competences as well as reduce antisocial and aggressive behaviors (Gouzouasis, et al, 2007).

Overall academic achievement was the best predictor of achievement in general music and music influences academic achievement in academic courses as well. Gardner supports the notion that all of the intelligences are strongly rooted in the arts, suggests the use of multiple entry points. These entry points are designed to be a way to engage students in making connections across the curriculum (Gullatt, 2008). Previous empirical and theoretical works suggest that the arts-based learning has positive effects on students' academic and social development that there is an inherent relationship between the arts and various aspects of human development (Gouzouasis et al., 2007). By involving students in learning catered to their specific intelligence strengths, they will become more active participants in the learning process (Gullatt, 2008). Because living and functioning in the world is a complex activity, students should be encouraged to participate in the process from multiple perspectives (Martin, 1998).

Traditional assessments provide little help to students in learning how to capitalize on strengths and compensate for or correct weaknesses, however broader tests can help students see where they have mastery and where they need to improve. According to Sternberg (2008), teachers can teach in ways that help students acquire the skills they need to succeed in school and life, thus instruction and assessment are two sides of the same coin. Therefore, it is suggested that arts should be integrated into the instruction of school valued academic abilities as indicated before and the intelligence types should be taken into consideration during assessment planning.

The integration of our empirical findings and the relevant literature with respect to the relation between academic achievement and multiple intelligence areas, (e.g. effects of music involvement) provide educational policy makers and school administrators with additional evidence to support and enhance the development of fine arts programs in the schools for both increasing the academic achievement levels and enhancing the self-concept of the students.

Self-confidence, in parallel with the self-efficiency, is likely to have occurred through normal developmental maturation, but interaction with academic staff and peers as well as academic challenges encountered during school may have hastened perceived development of personal and social skills. Thus the improvement of self- confidence may be internalized as a new sense of academic ability. In schools, teachers and ministers have to pay attention and give importance to establish an environment that is based on mutual respect and trust, thus personal attention from them and the relatively relaxed atmosphere of school enables students to explore themselves, which in turn,

may improve their self-concept. In addition, improvements in personal skills likely affect similar gains in academic performance. Future research may examine which of the intelligence type that students believe is associated with academic achievement and self-efficiency.

References

- Akboy, R. (2004). *Eğitim psikolojisi ve çoklu zeka*. İzmir: Dinazor Kitabevi
- Akboy, R. & İkiz, E. F. (2007). *Psikolojik danışma ve rehberlikte çağdaş bir yaklaşım*. Ankara: Nobel Yayınevi, ISBN: 978-9944-77-128-3.
- Aprill, A. (2001). Toward a finer description of the connection between arts education and student achievement. *Arts Education Policy Review*, 102(5), 11-14.
- Barnard, L. & Olivarez, A. (2007). Self-estimates of multiple, g factor and school-valued intelligences. *North American Journal of Psychology*, 9 (3), 501-510.
- Butzlaff, R. (2000). Can music be used to teach reading? *The Journal of Aesthetic Education*, 34 (3-4), 167-178.
- Costa-Giomi, E. (1999). The effects of three years of piano instruction on children's cognitive development. *Journal of Research in Music Education*, 47(3), 198-212.
- Costa-Giomi, E. (2004). Effects of three years of piano instruction on children's academic achievement, school performance and self-esteem. *Psychology of Music*, 32(2), 139-152.
- Çongur Yeşilkaya, Ö. (2006). *İlköğretim 4. ve 5. sınıf müzik eğitimi derslerinde çoklu zeka kuramının uygulanması*. Ulusal Sınıf Öğretmenliği Kongresi Bildiri Kitabı 1. Cilt ISBN: 975-499-361-0. 14-16 Nisan 2006, Ankara.536-541.
- Demirsoz Selcioglu, E. & Kocabaş, A. (2006). *Zeka kuramına dayalı işbirlikli öğrenmenin erişi ve hatırdada tutma üzerindeki etkileri*. Ulusal Sınıf Öğretmenliği Kongresi Bildiri Kitabı 1. Cilt ISBN: 975-499-361-0. 14-16 Nisan 2006, Ankara.522-535.
- Eisner, E. (1998). Does experience in the arts boots academic achievement? *Arts Education*. 51(1), 7-15.
- Fraenkel, J. R. (1994). The evolution of the Taba Curriculum Development Project. *The Social Studies*, July/August, 85(4), 149-159.
- Furnham, A. (2000). Thinking about intelligence. *The Psychologist*, 13 (10), 510-514.
- Furnham, A. & Akande, A. (2004). African parents' estimates of their own and their children's multiple intelligences. *Current Psychology: Developmental, Learning, Personality And Social*, 22(4), 281-294.
- Furnham, A. & Chamorro-Premuzic, T (2005). Estimating one's own and one's relatives' multiple intelligence: A study from Argentina. *The Spanish Journal of Psychology*, 8(1), 12-20.
- Furnham, A., Hosoe, T. & Tang, T. (2002). Male Hubris and female humility? A cross-cultural study of ratings of self, parental and sibling multiple intelligence in America, Britain and Japan. *Intelligence*, 30, 101-115.
- Furnham, A. & Mottabu, R. (2004). Sex and culture differences in the estimates of general and multiple intelligences. A study comparing British and Egyptian Students. *Individual Differences Research*, 2 (2), 82-96.

- Gardner, H. (1993). *Multiple intelligences: The theory in practice*. Basic Books: New York.
- Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. Basic Books, New York.
- Gouzouasis, P., Guhn, M. & Kishor, N. (2007). The predictive relationship between achievement and participation in music and achievement in core Grade 12 academic subjects, *Music Education Research*, Vol. 9, No:1, 81-92.
- Gullatt, D. E. (2008). Enhancing Student learning through arts integration: Implications for the profession. *The High School Journal*, April/ May, 12-25.
- Lopiccolo, J. & Blatt, S. J. (1972). Cognitive style and sexual identity. *Journal of Clinical Psychology*, 28(2), 148-151.
- Kaptan-Aykaç, V. (2006). *Sanat eğitiminde aktif öğrenme*. Ulusal Sınıf Öğretmenliği Kongresi Bildiri Kitabı 1. Cilt ISBN: 975-499-361-0. 14-16 Nisan 2006, Ankara. 542-549.
- Martin, A. (1998). Why theatre should be integrated into the curriculum. *NASSP Bulletin*, 82 (597), 30-33.
- Mnastersky, R. (2005). Studies show biological differences in how boys and girls learn about math, but social factors play a big role too. *Chronicle of Higher Education*, 51(26).
- Munoz, M. A., Ross, S. M. & McDonald, A. J. (2007). Comprehensive school reform in middle schools: The effects of different ways of knowing on student achievement in a large urban district. *Journal of Education For Students Placed at Risk*, 12(2), 167-183.
- Neto, F., Ruiz, F. & Furnham, A. (2008). Sex differences in self-estimation of multiple intelligences among Portuguese adolescents. *High Ability Studies*, 19(2), 189-204.
- Rauscher, F. H. (2003). *Can music instruction affect children's cognitive development?* ERIC Clearinghouse on Early Education and Parenting, ERIC Digest Available online at <http://www.ericdigests.org/2004-3/cognitive.html> (accessed 10 January 2009).
- Selcioglu, E. (2005). *The effects of cooperative learning based on multiple intelligences theory on achievement and retention in music*. Dokuz Eylül University, Educational Sciences Institute, unpublished graduate thesis.
- Sternberg, R. J. (2008). Assessing what matters. *Educational Leadership*, 65, Issue 4, 20-26.
- Vaughn, K. (2000). Music and mathematics: modest support for the oft-claimed relationship, *The Journal of Aesthetic Education*, 34 (3-4), 149-166.