



Studying & Comparing Creativity of Students with Learning Disability & Ordinary Students at Elementary School of Tehran

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Abstract: The purpose of this research is studying and comparing creativity of students with learning disability and ordinary students at elementary school of Tehran. In this way, 45 girl students with learning disability were selected by field method and sampling method among learning disability centers of Tehran and 15 ordinary girl students were selected among schools of Tehran in order to control unwanted factors such as: age, gender, iq, social and economic factors. This research applies from (form b) of creativity test of Torrance and short form intelligence test of wechsler. In order to analyze data it is applied from unilateral variance analysis test and follow up test of Scheffe & Toukey. Results of research showed that the creativity grade of students with learning disability is more significant than ordinary students and students with writing and calculating disability have better creative thought of Torrance than ordinary students. However, the statistical difference was not significant that is due to different brain structure such as spatial and visual talents. Thus, it is recommended that educational planners should benefit from creativity of students for educating positive properties of students and solving deficiencies.

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Key Words: Learning disability, Creativity

1.Introduction

Generally persons with learning disability have medium or close to medium level of IQ and even higher than medium level i.e. these people have lower advancement for reading and mathematics than other people (Hardman et al, 2003, Alizadeh et al, 2009). Estimation for learning disability of students is different and variable between 1% to 30% (Halahan and Kafman translated by Maher, 2006). This is term for children having learning problem (vision, auditory deficiency...) movement deficiency, mental retardation, emotional anxiety or lack of having cultural and economic environment (Kirk, Galager, 2006, Javadian, 1385).

Different types of learning disabilities are including:

Children with Dyslexia

Dyslexic is observed among students with learning disabilities (Hardman et al 2003, translated by Alizadeh et al, 1388). Students having learning disability feel unsafe while reading and have physical tension, forget reading line, eliminate or add words, substitute letters and words, read words inversely, unable to comprehend and have related problems for easy reading (Katala, translated by Amiri Majd, 1386). Students with learning disability have larger right brain hemisphere than ordinary students (Sosa,

2001, Yarahmadian and Kajbaf, 2007). The brain of students with learning disability show unnatural cellular growth than other students (Karyoli, 2001).

Children with dysgraphia

These children in comparison with their peers show different performance while writing. This disability influences on educational progress and generally continues until adulthood. This problem may also be available for slow writing, poor letter writing, problem for space between letters, skills of writing essay. Physical problems for using pen and problems for understanding spatial relationship leads to problem in shape of writing letters and space between letters and terms (Hardman et al, 2003, Alizadeh et al, 1388). Dysgraphic is neurological disability that originates from several factors. Problems in brain hemisphere lead to writing disability. Sometimes disability is due to understanding spatial relationship at brain hemisphere by having difficulty for pronunciation and poor reading test (Sosa, 2001, Yarahmadian & Kajbaf, 1385).

Children with dyscalculia

Some children with learning disability have difficulty for understanding mathematical problems. Terms that is applied for this mode is dyscalculia or disability for

calculating and understanding mathematical concepts (Seif Naraghi and Naderi, 2010). Nearly, 6% of children at school age have problem for processing mathematics (Sosa, 2001, Yarahmadian and Kajbaf, 2009). One of the oldest theories is neurologic disability at right hemisphere of brain especially at loop. These are is in charge of processing visual and spatial stimulations for solving mathematical skills. Due to selecting loop it is involved with numerical operation and damage to this area leads to problem for understanding mathematics (Sosa 2001, Yarahmadian and Kajbaf, 2002). Disorder at spatial imagination influences on performance at mathematical problems such as: geometry and solving complicated oral problems (Yarahmadian, 2004). It is to be noted that each of us are unique human by having their own specific skills and abilities. Many famous successful persons have learning disability (Nicolas, Bita translated by Amiri Maid 2003). Some of the positive consequences of learning disability are including: mental imagination and exceptional abilities in arts, geometry and music . Creativity is not limited to intelligent persons, although they have higher skills for benefiting from creative solutions, creativity is also available among ordinary and even exceptional children. Many of the low progress students are exceptional bilaterally i.e. intelligent with learning disability (Silverman, 2005). Such students often feel that they belong to two worlds one of them as student with high level of skill and the other as student with learning disability.(King, 2005). At many cases these students are not recognized; since, their weak point hidden their abilities (Kolbert and Ris, 2004). Students with learning disability have spatial visual learners (Esword, 2005). Research shows that abilities of students with learning disability is related to cognitive performance of right brain hemisphere and their poor performance is related to deficiency in left brain hemisphere (Taver et al, 1980). Torrance (1994) refers that creativity consists of 4 main elements including: 1) Fluid (talent for creating abundant ideas) 2) Extension (talent in compliance with details) 3) Nobility (talent for creating unnatural ideas) 4) Flexibility (talent for creating ideas with different methods) (Balzak, 2006). In addition, neurology studied creativity and concluded that creative innovation requires activities of different areas of brain simultaneously that has not ordinary longitude relationship (Amiri and Asadi, 2007). One of the common misunderstandings in relation to learning disability is reducing consciousness. Nevertheless, the reality is not this. Many of such students are very agile and benefit from creative and innovative methods for solving their impediments (Saeman,

2010). Students with learning disability are challenging with talents and creativity (Kolman, 2005). Such students suffer from learning disability generally hide their talents and they are regarded as medium ordinary child. Silverman refers that inability influences on left brain hemisphere which lead to child with spatial-visual learner. On-time recognition and intervention is among success keys for students (Silverman, 2003). One method for discriminating such students with others is their educational performance and potential abilities (Lovett and Lewandowski, 2006).

Visual spatial Ability:

Spatial intelligence plays key role on learning that consists of ability of imagining objects, creating mental inner images (Lerner 1997, Danesh, 2005). Learners of this type of intelligence have attitude toward looking to a photo for obtaining required information and creating clear mental image i.e. they learn through looking maps, diagrams, photos, video and movie. Mental illustration and spatial imagination plays key role on creativity (James, 2001). Spatial-visual thinkers are total to detail learners and are in search of unordinary solutions (Esword, 2005). Karamvan (1995) stated that creativity is not just affiliated to right brain hemisphere; nevertheless, this claim is offered by persons with superior left brain hemisphere or not having any superior part of their brain. The relationship between brain hemispheres is significant between creative persons and it is assumed that brain trauma in such person increases their creativity. Probably difference between brain structures creates learning and creativity disability. If creativity is product of divergent thought, it is necessary for referring to role of both hemisphere of brain. Some researchers believe that it is not possible to affiliate learning abilities, inference and insight to right and left brain hemisphere. Williams (1984) believes that both brain hemispheres have arranged performance i.e. comprehension at left brain hemisphere shows oral communication and right brain hemisphere refers to influence of this issue. Some researches refer to important role of right brain hemisphere on creativity and some other researches focus on merging duties of both brain hemispheres. Generally, it is concluded that from bio-neurological point of view due to deficiency at left brain hemisphere in persons with learning disability and abilities of right brain hemisphere and role of right brain hemisphere on creativity, persons with learning disability have creativity. Thus, whereas students with learning disability are among the largest group of exceptional children and according to individual differences of students with learning disability, this issue is important that if students with learning disability are

creative, parents of such students should recognize and improve their talents. Such researches deal with recognizing strong and weak points of students with learning disability and their parents and teachers. On this basis, the general purpose of this research is studying and comparing creativity among students with learning disability and ordinary students of elementary schools of Tehran and offering recommendation to persons in charge of Ministry of Education and other applicable organizations based on research findings. The following hypothesis are offered for this research:

- 1) There is significant statistical difference between creativity of students with learning disability and ordinary students
- 2) There is significant statistical difference between creativity of students with writing disabilities and ordinary students
- 3) There is significant statistical difference between creativity of students with dyscalculia and ordinary students

2. Material and methods

Research methodology is ground and statistical universe of this research is all students either with or without learning disabilities and ordinary girl students of Tehran. Sample group was selected among elementary schools of Tehran. Therefore, 45 girl students with learning disability (15 students with dyslexic, 15 students with dysgraphic and 15 students with dyscalculia) were selected by available sampling method (9 girls from each academic year) at center for students with learning disability of Tehran and 15 ordinary students of elementary school at district.4 and 6 of Tehran (3 girls from each academic year) in order to control unwanted factors such as: IQ, gender, age, social and economic status that was compared with students with learning disability. In order to evaluate consciousness, it is applied from Wechsler test (short form) by having IQ range of 90-114 that its average is 100. Then both groups completed form

b of Torrance and after grading Torrance test, a grade was allocated to each student.

A) Torrance Test of Creative Thought (Form B)

Torrance test of creative thought has A and B parallel forms. In this research, it was applied from pictorial Torrance test of creative thought. This test was executed at elementary school for individually. This test is appropriate for Kindergarten to Master's Degree level. Torrance in his research obtained self-correlation coefficient of 0.86 to 0.99 (Torrance, 1974, Karami and Ahmadi, 2008).

B) Wechsler Test (Short Form)

In order to economize time for estimating consciousness, different type of short form test by using Wechsler test were prepared. The average time of test is 20 minutes. From conceptual point of view the word bank and designing cubes are regarded as suitable tests; since, both of them are good index for performance of g factor and are reliable and show small sample for test of oral and non-oral index. Word bank consists of compressed oral learning test and shows ability of person for facility and flexibility of range of thought that this index consists of public intelligence. Designing cubes consists of skills for solving non-oral problems. Test should apply logic and inference for solving spatial problems. This test refers to skill for understanding, visual imagination, spatial relationship and abstract conceptualization. This test is reliable and valid and has high correlation with public intelligence and is independent from culture. The fundamental condition for each short form of Wechsler has 0.90 correlation with complete form. Correlation of Wechsler (designing cubes and word bank) with complete index is generally 0.90. (Maranet, 2003, Sharifi and Nikkhou, 2008).

3. results

Table 1: Unilateral variance analysis test between group of students with learning disability and ordinary students

Statistical index	Sum of squares	Degree of freedom	Average of squares	Ratio of F	Probability of F
Between group variance	8637.93	3	2879.31	5.07	0.004
Inner group variance	31778.4	56	567.47		
Sum of data	40416.33	59			

According to table 1, whereas ($f=5.07$) degree of freedom is 3 and 56 is larger than level of f ($f=2.76$); therefore, by 95% certainty it is concluded that there is difference between average creativity of 4 groups.

1th Hypothesis:

There is significant statistical difference between creativity of dyslexic and ordinary students

Table 2: Descriptive properties of grades obtained from creativity grade for dyslexic and ordinary students

Statistical index	Average	Standard deviation	Standard error
Group of ordinary students	88	27.29	7.04
Group of dyslexic students	121.53	17.22	4.44

According to table 2, based on unilateral variance analysis test and follow up test of Scheffe, there is significant statistical different between creativity of these 2 groups. Whereas obtained averages, the grade of 121.53 among dyslexic students is higher than ordinary students. On this basis, the zero hypotheses is rejected with 95% certainty and research hypothesis is confirmed. Therefore, it is concluded that dyslexic students are more creative than ordinary students

2th Hypothesis:

There is significant statistical difference between creativity of disgraphic and ordinary students

Table 3: Descriptive properties of grades obtained from creativity of disgraphic and ordinary students

Statistical index	Average	Standard deviation	Standard error
Group of ordinary students	88	27.29	7.04
Group of disgraphic students	105.86	23.14	5.97

According to table 3, based on unilateral variance analysis test and follow up test of Scheffe, there is significant statistical different between creativity of these 2 groups. Whereas obtained averages, the grade of 105.86 among disgraphic students is higher than ordinary students. In spite of this difference, the difference is not statistically significant. On this basis, the zero hypotheses is rejected. Therefore, it is concluded that creativity of disgraphic students is not higher than ordinary students

3th Hypothesis:

There is significant statistical difference between creativity of dyscalculia and ordinary students

Table 4: Descriptive properties of grades obtained from creativity of dyscalculia and ordinary students

Statistical index	Average	Standard deviation	Standard error
Group of ordinary students	88	27.29	7.04
Group of dyscalculia students	109.26	26.31	6.79

According to table 4, based on unilateral variance analysis test and follow up test of Scheffe, there is significant statistical different between creativity of these 2 groups. Whereas obtained averages, the grade of 109.26 among dyscalculia students is higher than ordinary students. In spite of this difference, the difference is not statistically significant. On this basis, the zero hypotheses is not rejected. Therefore, it is concluded that creativity of dyscalculia students is not higher than ordinary students.

Creativity factor	Statistical index	Average	Standard deviation
Fluid	Ordinary	17.46	4.15
	Dyslexic	20.33	2.99
	Dyscalculia	18.66	5.24
	Disgraphic	19.40	4.85
Flexibility	Dyslexic	17.66	2.35
	Dyscalculia	14.93	2.76
	Disgraphic	16.86	4.27
Nobility	Ordinary	13.93	4.14
	Dyslexic	18.06	3.45
	Dyscalculia	19	5.97
	Disgraphic	20.53	6.58
Extension	Ordinary	41.86	18.69
	Dyslexic	65.46	12.43
	Dyscalculia	56.66	17.85
	Disgraphic	49.6	11.47
Creativity	Ordinary	88	27.29
	Dyslexic	121.53	17.22
	Dyscalculia	109.26	26.31
	Disgraphic	105.86	23.14

According to table 5, grades of nobility, extension and flexibility of dyslexic students is significantly higher than ordinary students; nevertheless, grade of fluid for both groups is not statistically significant. The grade for nobility of disgraphic students is significantly higher than ordinary students; nevertheless, at extension, fluid and flexibility there is no statistical significant difference between both groups. The grade of nobility for dyscalculia students is higher than ordinary students; nevertheless, extension, fluid and flexibility of both groups do not have statistical difference.

4. Discussions

According to findings of 1th theory, the creativity grade of dyslexic students was significantly higher than ordinary students i.e. dyslexic students are more creative. West (1999) in his book called Hidden Eye has mentioned that many dyslexic students are creative and find relationship between irrelevant ideas. Ability of right brain hemisphere among dyslexic students is regarded as spatial-visual talent that is related with creative thought. Many inabilities influence on left brain hemisphere which lead to having spatial-visual learner (Silverman 2003). Often dyslexic students observe large photos with a short glance than others (Esword, 2005). Creative talents of

dyslexic students are related with spatial-visual talents (lovert, Stephert and Smith, 1999). Spatial-visual thinkers have suitable performance in the fields requiring creativity and mental illustration such as: arts, music and engineering. Researches show that infrastructure activities of learning disability and creativity are the same. Many persons having excellent spatial-visual talents, have dyslexia (Weber et al, 2001). Mental illustration plays key role at learning and creative thought of dysgraphic (Akhavan, Hamidi and Mohammadi, 2009). Growth of spatial-visual talents is regarded as important parts of creative thought (Overt, Stephert and Smith 1999). Their attitude is different toward affairs (Wolf Lodberg, 2002). Each dyslexia person has his own unique properties; since, mixture of talents, weak points and inability that its root is brain performance (Simon, 1999). In most of cases the left brain hemisphere is in charge of processing and for most of people the left brain hemisphere is larger than right brain hemisphere. This pattern that left brain hemisphere is larger than right brain hemisphere is not observed at most of dyslexic persons that is a reason for spatial-visual talents and creativity (Overt, Stephert and Smith 1999). Right hemisphere (resource of creativity) is more powerful among dyslexic persons (Silverman 2005). Studies show that

right brain hemisphere is in charge of creativity and understanding spatial issues (Kalantari Dehghi, 2003). These results was correspond with results of research of aron & glford(1993), yung(1994), evert & staffert & smith(1999), karioly(2001), webber & colleagues (2001, paediatier (2005), korlu & colleagues (2007) , akhavan ,hamidi, mohammadi (2009) and was nt correspond with reults of research of lafransva(2009) & winner(2003) . According to the findings of 2th theory, the creativity grade of disgraphic students is higher than ordinary students; in spite of this difference, there is no statistically significant difference i.e. disgraphic students are not creative than ordinary students. Visual thought is creative and is related with intuition, divergent thought and invention. These properties are fundamental for creativity (Silverman 2003). For example, Solso (1998) narrated by Hosseini 2007 stated that right brain hemisphere is directly involved at processing creativity and problems at this area of brain lead to disgraphic (Maccarty 1990). Sometimes deficiency in performance of understanding spatial relationship of right brain hemisphere in spite of having correct pronunciation leads to dyslexia (Sosa 2001, translated by Yarahmadian and Kajaf, 2007, p.18). In the way of performance of left brain hemisphere, many researches shows the important role of right brain hemisphere that is due to creativity test, difference at partial IQ with learning disability and ordinary student at small groups. These results was correspond with results of research of vallas (1970), arguleviks (1979),tarver(1980),miller & colleges (1992), mach coach riss(2001) and was nt correspond with reults of research of kim yun jun & ko young jun(2007). According to findings of 3th hypothesis, the creativity grade of dyscalculia students was higher than ordinary students; in spite of this difference, there is no statistically significant difference i.e. dyscalculia students are not more creative than ordinary students. Visual though is creative (Silverman 2003). Researches show that right brain hemisphere is mental, imaginary, spatial and creative (Kalantari Dehghi, 2003). Sebastian and Sarish (2000) referred that whereas loop is involved at numerical operation, any damage to this area leads to problem. Studies of persons with Grestman syndrome as a result of damage to loop show that set of problems are related to mathematical calculations and inability for finding right and left direction and persons with visual processing show dyscalculia (Sosa 2001 translated by Yarahmadian and Kajbaf ,2002). Soanson 2003 narrated by Raeiei 2005, p.9 stated that deficiency at spatial imagination influences on geometry and complicated solving oral problems (Yarahmadian 2004). The main element for recognition processing is mental illustration and

imagination (Silverman 2003). These results was correspond with results of research of vallas(1970),arguleviks(1979),tarver(1980),miller&c olleges(1992), mach coach riss(2001) and was nt correspond with reults of research of kim yun jun & ko young jun(2007). Of course this event is affiliated to different type of tests such as: creativity, different IQ among persons with learning disability, ordinary persons and small groups. It is to be noted that this research is limited to Tehran and was only applicable for students at elementary school (7 to 11 years) and only girls were considered that are among limitations of this research.

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