

# Effectiveness of Jabir Ibn Hayyan's Plot in Ground of Female Student's Creativity

**Hanieeh Manteghi, M.A.**

Department of Humanities,  
Islamic Azad University, Hamedan Branch, Hamedan, Iran

**Dr. Nasrolah Erfani, Ph.D.**

Department of Psychology,  
Payame Noor University, I. R. of Iran

**Abstract** – The aim to the present research was to determine effectiveness of Jabir Ibn Hayyan's design in ground of female students' creativity. Method used for the research was scientific-comparative. Hundred and forty two female students out of statistical society of grade six female students in Hamedan city participated in Jabir Ibn Hayyan's plot in academic year of 2012- 2013, and their counterparts, 141 students not participating in Jabir Ibn Hayyan's design were selected and responded to 60 question Nair of Abedi Creativity. Data after considering necessary assumptions was analyzed by multi variable variance analysis of statistical test. Results showed that Jabir Ibn Hayyan's design has been effective in all aspects of students' creativity. So that caused improvement in students' creativity. Therefore one can conclude that Jabir Ibn Hayyan's design has been effective in students' creativity.

**Keywords** – Jabir Ibn Hayyan's Design, Creativity, Student, Sixth Grade Primary.

## I. INTRODUCTION

Continuity in organizations' life depends on their rebuild. Organizations' rebuild occurs through coordinating aims to day's situation and modifying improves methods to gain those aims. Without rebuilding, the organization fails to continue faro longtime. Creativity is necessary for every organization's survival. Non creative organizations would disappear from the scene by pass of time, although it is possible that these types of organizations be successful in operations involved in an interval of their life but finally they become obliged to close or make a change in the organization (Rezaian, 2006).

From the last days of stone era' s life to today's complicated civilization, always the human's growth and survival has been in debt of creativity and renovation and still it is so. All of discoveries and scientific theories, inventions and renovations & artistic literal wonderful works are manifestations of creativity. Creativity and innovation are the major stimulates to civilization and we need them to get improved in industry. Economy, politics and all sciences, The creativity that has underpaid in our inner in, and impacts our life's quality. The best space to breed that is education. Education, with regards to it's effective role in development of creative thinking and creative human, is an appropriate context to flourishing that. Because teachers regarding their key role can flourish or wither the creativity in students. Say, if in a classroom some spaces or conditions are made and individual differences between students are taken into account, and effective teaching methods are employed, then the

required background to emerge creativity, will certainly be provided. And creativity will grow (pal, 1994).

According to Simonton (quoted from cresting, 2003) we can't be creative unless be able to do tasks which we couldn't do them previously, and by conducting guessable activities we may cause emerging new Fruitful ideas. Robert Gane considered creativity as a particular type of solving problems. But not solving them clearly (Sadeghi Mal Amiri & reisi , 2010). In this regard, Kreisler & Casein (2011) concluded from their investigations that, people of higher Cognitive levels, Can develop more creative designs. Overly et al (2010) also stated in their investigations that, individuals with higher levels of cognition, are more Skillful in development and solving of problems.

Creativity is a conception that it's definition has changed during times. Creative thinking is the process of sensing issues or deficiencies present in data, making theories pertaining solve of problems and removing deficiencies, evaluation and examine of theories, their revision and retest, and finally the results will be conveyed to others. Creativity involves producing something that is both genuine and valuable. It should be originated from conscious and unconscious processes in humans. From a scientific point of view, products of creative thinking sometimes are referred to divergent thinking (Barzideh & Jan Mashayekh, 2010).

To educate the creativity is from significant subjects under attention of teaching orders. Creativity means to develop something from something else so that, is unique and to produce a new fruitful notion. Somehow creativity is the ability to form a new compound. Creativity is to play with imagination power and possibilities, in which during interaction with beliefs, individuals and environment causes new and meaningful relationships and results.

Education dip in Hamedan city has taken action to perform Jabir Ibn Hayyan's design at alimenting level. Along with that, regarding it's performance in Hamedan city alimenting level it could be said that, educative aim for an alimenting level student is to obtain skills of sciences basically. It is not expected from such student to invent or do scientific discoveries. Therefore the culture should be propagated among teachers and students from the beginning, that aims to participate in process of performing scientific project and not to invent or do new scientific discoveries. Thus each one who can participate in school's show by conducting a project, Would win, and to predict higher of levels of festival is only a good excuse for more organizing the activity (Erfani, 2010).

A scientific project because of its exciting and discovering essence boosts wills of students to learn, and because of its percussive origin teaches also the learning methods or ways. Therefore it could be very powerful tool to serve teaching and education in its real sense. According to uniccò's definition it is to understand and employment of concepts, percussive skills, insights and values that enables a person to correlate knowledge and technology to the life and his/her own social culture (Seyf, 2000).

Jabir Ibn Hayyan's plot on implementing the aims to elementary level, provides the approval of education deep. High assembly particularly. With the following grounds:

A) Teaching and Scientific aims include: making the students familiar to the Persian language and teaches him/her ability to take advantage of books and newspapers, shows him/her the value of science in proper conduction of tasks to an extent, he/she gets familiar to an extent, to learning quality.

B) Social aims include: Teaches students how to cooperate with others: students take part in games and collective activities, they undertake performing duties and responsibilities left to them.

C) Biological aims include: students protect and use their own senses nicely, would try to maintain the biologic environment, they learn security point and may try to respect those.

In addition to above aims, the following goals could be noticed for performing Jabir Ibn Hayyan's plot:

To communicate with others, and supporting life skills. Among students like decision making and problem solving and several abilities, talents and interests of students may not reflect at ordinary classrooms, and hence they are not recognizable and educatable. A scientific project makes a suitable opportunity to observe these talents and identify and boost them as well. Therefore a scientific project could be an appropriate strategy to implementing one of important goals of education order, say developing grounds for student's creation of job.

Elementary level student has a great difference with his/her teacher and parents in skill & knowledge level. Perhaps many of his/her selections in projective outlines are considered absolute skills and information's for his/her parents & teacher. Thus, the problems which are solved properly for us during years of experience, are a new opportunity for an elementary level student, next he/she can find new skills and experiences and access to a new cognition from his own peripheral world. Basically this is one of the project's goals. In this design, teachers and principals which are the major basement for performing the design, make students familiar with methods to perform the design.

Different researches on breeding the creativity have taken place and they have had interesting results. Namely: (Blsat & magarat. 1996 quoted from Heydari Azfar 2006) in a research they have investigated the relationship between creativity and skill to solve problems.

In that research they wanted to see that whether breeding the creativity and breeding problem solving are complementary to each other. Researchers have divided

testable into four groups. They Taught creativity for the first group, problem solving for second group, and both of above skills for the third group. But fourth group received no teaching. Results from the research showed that, those two skills are compel monetary to each other, and the group which has learned both skills, have obtained both of skills consequently. But other groups were not as so.

Burn (2007) performed a research to prepare an educative, teaching framework for creativity. In that study, creativity is defined as a spiritual process which includes multiple elements of intelligence, personality and peripheral impacts which is able to offer new, unknown and authentic resolutions to the problems of one domain.

Marker and Joe (2008) have performed a research titled "growth of creativity among American students". Results showed that expansion of creativity is under effect of several factors. They include periphery, changes developed for expansion and measurement tools. In essay the relationship present between creativity expansion and employing methods to subjective programming and exploring though abilities have been investigated. This people were evaluated for three academic years by using creative thinking and drawing tests (TCT-DP). Creativity expansion among those student from 1 to 6<sup>th</sup> grade was increased, but students not having seen that procedure in the classrooms, stopped in this process. Differences available in obtained scores by students with little us ago, middle use and high one, were observe able clearly. This issue means that creativity expansion will be supported by: process of active learning, student's own Choice, access to various resources, explore, self- evaluation, finding problem and problem solving.

Henshon (2008) has performed a research titled correlation of intelligence and creativity among students. Results showed that there was a little relationship between general intelligence and whole creativity. Also, in order there is a negative, meaningful consolidation (-0.17) between general intelligence and fluidity, non meaningful consolidation between general intelligence and initiation (0.1), negative meaningful consolidation between general intelligence and flexibility (- 0.20), and at last a non meaningful consolidation between general intelligence and expansion (0.06).

Thatcher and Brown (2010) have conducted a research under title of importance of mass media combination in creativity. Results showed that high levels of self-esteem and demographic differences based on information s effects creativity positively. Difference in social classes effects creativity negatively. When people have more interactions with each other, incorporating communicative media can be an important mediator which relationship between self-esteem and demographic differences of social classes based on information s and creativity will be less. Results of above will be meaningful for managers who encourage creativity expansion among their humanistic resource by using connective multiple media.

Pauline and Workman (2011) have done a research titled effect of teaching-learning process on promotion of creativity and innovation. The research has been performed as a case study. Results showed that methods to

teach problem solving would be more effective in promoting creativity.

In Iran different research has been done on creativity, namely: Heydari far far (2006) has done a research named "determination of method to teach problem solving in students' creativity". Measurement tools to that research was Abedi's creativity test. He found that using problem solving method impacts significantly students' creativity and sex is as an adjust mental variable. Method of teaching problem solving effects students' creativity. That the method has more effects on male students' creativity than female students.

Also Forughi (2009) has performed a research in effect of teaching method of group discussion on creativity of third grade students of Isfahan city's region 3 guidance schools.

Results showed that there was a meaningful difference between test group (group discussion) and witness group (lecturing) for creativity. Meaning that, teaching by group discussion method has a meaningful effect on students' creativity. Thus scores of creativity in test group was meaningfully more then scores of witness group' s creativity, Findings also showed that there was a meaningful difference between creativity scores of girls and boys, and effect of group discussion in scores of creativity in boys is meaningfully more than the effects on girls.

Emadi et al (2009) have performed a research titled relation between creativity of teachers with exploiting teaching aid media in teaching subject of empirical sciences at first grade of guidance schools in Hamedan city. Results showed that there was a meaningful difference statistically between teachers' creativity and rate of exploiting teaching aid media in process of teaching. There was no difference between rate of creativity in females and male teachers. Also no meaningful difference observed between level of exploiting teaching media in process of teaching of female and male teachers. There was no meaningful difference between yearly profile of teachers services and rate of exploiting teaching aid media teaching process. Also no meaningful difference was observed between level of teachers' educations and rate of exploiting teaching aid media.

With such story, one can find that, breeding creativity is of that most important goals to education department. In the same area in education order of elementary level, Jabir Ibn Hayyan's design has been implemented. Thus the main problem of present research was whether Jabir Ibn Hayyan's design has been effective in breeding students' creativity?

## II. METHOD

Statistical society of the research includes all female students of sixth at elementary of Hamedan city who were studying in academic of 2012-13. Sample size was 141 individuals which by using Koran formula with multiple stage cluster sampling method, they were selected among students who had participated in Jabir Ibn Hayyan's

design. Then another 141 students not participating in Jabir Ibn Hayyan's design and counter parts of participated students were selected for comparison.

TO scale the creativity, Abedi's creativity questionnaire was used. This questionnaire contains 60 articles. Each article has 3 choices of a, b or c, with in order scores of 3, 2, 1 posses to them. The questionnaire measures 4 components of initiation, fluidity, flexibility and expansion, in order with 16 questions, 22 questions, 11 questions and 11 questions. Jan Mashayekh and Barzideh (2010) confirmed the questionnaire's fluency and durability. Kronbach alpha coefficient was 0.83 and feature fluency of questionnaire was acceptable. Also content fluency of questionnaire for analyzing material, consol libation of each test's question with total score of test was meaningful at the level of  $P < 0.01$ . tests' fluency and durability before major performance were investigated during an initial study. Results of kronbakh alpha showed that, amounts of durability for component of fluidity is 0.71, for expansion 0.66, initiation 0.20, for flexibility 0.66 and for the whole questionnaire is 0.87.

In this research in addition to using abundance distribution table and percent and dissociative central indices of descriptive statistics, multi- variable variance analysis is used in order to testing research theories. However before exploiting above test, it's assumptions were investigated. For this purpose, drawing of p-p diagram to investigate the normality of data distribution, drawing of dissociation diagram to investigated linearity between dependent variables, test of consolidation coefficient to investigate multiple non linearity between dependent variables, box test for endow genetic variables' variance- covariance matrix and statistics of lone for endow genetic of variables' variance, were used respectively. By the way, data analysis was done by using SPSS software.

## III. FINDINGS

Abundance distribution and students' percent of rank obtaining show that, in group of participating in Jabir Ibn Hayyan's design, 66.4 percent did not obtain any rank.

But 29.8 percent at the school level, 6.4 percent in the region's level and 1.4 percent in province's level, have obtained some ranks. But students not participating in Ibn Hayyan's design, naturally did not obtain any rank.

Results indicate that in the group of students participating in design, academic improvement is 19.33 and standard deviation is 0.86. By the way average academic improvement among students not participating in the design was 19.11 and SD is 1.21.

Those Results show that in the group of participating average fluidity component is 30.26 and it's SD is 5.83. Average expansion component 14.21 and it's SD is 3.29, average initiation component 20.33 and it's SD is 4.68, average flexibility 15.72 and it's equal 3.76 and average creativity 80.51 and it's SD equal 14.61. By the way among not participating students in the design, average fluidity component 27.08 and it's SD is 7.18, average expansion component 12.67 and it's 4.01, average

initiation component 18.68 and it's SD is 5.55, average flexibility 13.13 and it's SD is 3.54 and average creativity 71.55 and it's SD is 18.03.

To test research theory, multi- variable variance analysis was used. However first it's assumptions for exploitation was investigated. To consider normality of creativity data distribution of participating students and not participating ones, drawing of p-p diagram was used. Results indicated normality and or near to normality of data distribution.

To investigate the linear relationship among creativity components of participating students in the design and also not participating ones the data dissociation matrix was drawn. Results indicated linear relationship between creativity components.

In order to investigate non presence of multiple co linearity between creativity components of participating and not participating students, results of Pierson consolidation coefficient test showed that calculated consolidation coefficients among each pair of creativity components are not more than 0.90. There for one can find that there is no multiple co linearity 14 between creativity components.

To test the endogeneity of variance-co variance matrix of creativity components of participating and not participating students, box test was used. Results showed that matrix of variance – covariance of creativity components of Jabir ... students and non Jabir ... students is endogenous.

Table 1: Summary of test results of multi – variable variance analysis of creativity components of Jabir ... and non Jabir ... students.

Partial $\eta^2$	P	Wrong df	df of Theory	F	Amount	Work
0.129	0.0001	277	4	10.224	0.129	Pilae
0.129	0.0001	277	4	10.224	0.871	Hutling
0.129	0.0001	277	4	10.224	0.148	Lambda wilks
0.129	0.0001	277	4	10.224	0.148	Biggest root on

P<0.001, n = 282

Along with research theory test, Results of multi-variable variance analysis show that there is a meaningful difference between creativity components of both groups. (F (4,277) = 10.244, p<0.01, Walk's Lambadi= 0.148,  $\eta^2$  partial=0.129) There for the research theory was confirmed. Thus one can find that performance of the design on female students creativity at sixth grade elementary level have been effective. Then each of creativity components of Jabir ... and non Jabir ... students were compared in pairs by one way variance

analysis test, using Ben Freon's regularized alpha. However first the endogeneity of groups studies variance was investigated by lone statistics. 15. Results of Lune statistics showed that there was no meaningful difference between variance of flexibility components, fluidity, expansion and initiation of Jabir ... and non Jabir ... groups. Therefore one finds that variance of fluidity, expansion & initiation components of students are endogenous.

Table 2: Summary of results on students components variance analysis test of Jabir ... and non Jabir ... groups.

P	F	Ms	Df	SS	Creativity component	Changes Resource
0.0001	16.636	711.716	1	711.716	Fluidity	group
0.0001	12.533	168.525	1	168.525	Expansion	
0.0001	7.244	190.865	1	190.865	Initiation	
0.0001	35.404	472.429	1	472.429	Flexibility	
		42.782	280	11978.950	Fluidity	wrong
		13.446	280	3764.950	Expansion	
		26.349	280	7377.631	Initiation	
		13.344	280	3736.355	Flexibility	
			282	244432	Fluidity	total
			282	54870	Expansion	
			282	114838	Initiation	
			282	62863	Flexibility	

P<0.01, n=282

In order to compare each of Jabir ... and non Jabir ... students creativity components, results from analysis one way variance show that there is a meaningful difference between average fluidity components (F(1,280) = 16.636, P<0.01), expansion (F(1,280) = 12.533, P<0.01) , initiation (F(1,280)= 7.244, P<0.01) and flexibility (F(1,280)= 35.404, P<0.01) of Jabir ... and non Jabir ...

Groups of students. In a manner that average fluidity components.

16. (30.25), expansion (14.21), initiation (20.37) and flexibility (15.72) of Jabir group students is more than average fluidity component (27.08), expansion (12.67), initiation (18.68), and flexibility (13.13) of non Jabir ... students.

#### **IV. DISCUSSION & CONCLUSION**

In investigation of research Theory which evaluated the Jabir Ibn Hayyan's design on recovery of dimensions to students' creativity, results of multi-variable variance analysis test showed that, there was a meaningful difference between creativity components of Jabir Ibn Hayyan's design and non Jabir Ibn Hayyan's design groups of students. There for the research theory was approved. Hence one finds that performance of Jabir's Ibn Hayyan's design on female students' creativity in sixth grade elementary level has been effective. With respect to averages of each creativity components one observes that all those components among individuals participated and not participated there was a meaningful difference. In particular of first component that scales rate of initiation among students, one can say that with respect to do creative tasks by students in design performance and stages of doing the job, they find opportunity to do works creativity. This leads to enhancement of students' initiation in Jabir's design. Results also showed that level of students' fluidity. Participated in the design was more than that of non Jabir Ibn Hayyan's students.

Fluidity means the ability of producing several thought & ideas which causes individuals to produce abundant thought & ideas. In grounds of fluidity of students' thought in Jabir's design, one should say that, with respect to working together of students collectively and that, they have possibility of listening to other criticisms and also hearing other members' thoughts, their fluidity will improve.

One can say in particular of rate of flexibility of Jabir's students that, this ability is much more than non Jabir ...students. Considering students of Jabir ...design who select different solutions in ground of research, and when they fail to pass the direction or along the route they decide to do new ways, this causes their flexibility to improve much.

Initiation, is ability to think with a non ordinary method and against current habits. Authenticity of initiation is based on offering non usual, wondering and cunningful answers to questions. Student in Jabir's design when doing the design & performance of different tests sees new things and this issue leads to offer new answers to around problems. In this confrontation with problems differently, he/she may do initiative tasks and some creative thoughts may enter his spirit.

Expansion is ability to notice details during conducting an activity. Expanded though considers all of required details for a design and it doesn't omit anything. Since this design's operators are students of elementary level, and in this senile group attention to details is much more than higher senile groups therefore this group of students may notice the moments of doing the design more accuracy and notice any change in process of performing design very soon.

These results are coordinated with findings of Paulin & workman (2011), Ttatcher and Brown (2010), Henshon (2008) Marker & Joe (2008), Burn(2007), Blast & Magarat (1996), Zakariaee (2010), Emadi et. al (2009 ),

Forughi (2009 ), Sharifi (2008), Hosseyni (2007), a research by Heydari far far (2006), and a research by Bahrami Rashidi (2010).

With respect to high correlation of creativity and problem solving Stammer (2005) concluded that creative individuals are more able to solve problems when confronting with new situations and as result they suffer less from depression.

Burton et. al (2006) also showed in their investigation that encouraging students to participate in creative collective activities will cause growth of creativity and learning in them.

Libode et. al (2007) in performing a research found role of teaching during service of teachers and Social backgrounds, a developer of students' trend toward creative activities. Jarvin et, al (2009) also in their research concluded that individuals with high creativity have more ability to solve the mathematical problems.

Cushen & wiley (2012) in a research concluded that change in students' insight related to development and solve of problems creativity can effect positively on function of solving their problems. Cheng (2012) stated that number of performed researches is also increasing in Asia and researches performed so far show that, different approaches like syllabus, educative systems, culture and social ground effect the growth of students' creativity, that teacher's role is of more importance among all.

In addition to abroad researches, there are some internal research as well performed on creativity. Amery (2001) investigated the effects of breeding games of students' creativity of elementary level. Results from that research indicated that breeding games effects growth of students' creativity positively. Hosseyni (2006) also found effect of learning programs on growth of students' creativity, significant.

Effects of teaching methods, was investigated by cherish chasm (2007) and results showed that, teachers as developers of facilitating conditions of students' creativity, can through modernism flexibility, not obliging students to memorize subjectively a lot, increase in self-esteem and stimulating curiosity sense and making teaching and research together, pay to educate the creativity in children and young adults. Jan Mashayekh & Barzideh (2010) have pointed to role of teacher in enhancement of students' creativity.

In general, results from researches indicate that different educative, social and factors play a basic role in growth of creativity skills. As results gained from researches show, enhancement in rate of creativity will be effective on rate of ability to solve problems and effects positivity the ability to solve problems in different ago groups.

Now the question is that Jabir Ibn Hayyan's design has been so fruitful rate ability so students' creativity? Have the peripheral factors been effective in this matter? Have involved members in the design done their duties fairly? Have students had access sufficiently to the tools and possibilities required for performance of this design? It seems that. There is still something to discuss about on this matter. But that, which is gained from the whole of this process is that students, because of correct pondering

and correct selection of subject, win which they were free, have received a proper, correct guidance, Thus have been so successful in this matter. perhaps students from the beginning of the way aiming to rivalry to friends and classmates select a subject in access but difficult to endure the way. For this reason, during research performance, embellish and extend other corners of design by using their own imaginative power and new thoughts of friends. But not befalling in difficult situations e.g. double pondering when confronting a problem. The very subject causes their creativity to grow.

So we had better that in this regard give some scores, possibility or any other rewards to participating individuals, till during performance of design, they confront with more difficulties and concerns to make the design route not a routine and certain route, It seems that, The less rate of parents' & teachers' surveillance on the design, the more risk taking will be the students. So if in design performance, the periphery and time are alike times that students go camping or visiting a place which causes more opportunities for students to grow in personality, the results of design performance will be much better.

It is suggested to officials and authorities of education office that, by holding during service courses and also b assemblies and compiled workshop for teachers and students, offer various types of creativity skills. Or that, by establishing classrooms for family education, make students' parents more familiar with educative methods to creativity skills.

By the way a comprehensive guideline gets held for honored teachers in creativity skills in the mould of classes, work shop or during service courses, to be a reliable connector for conveying to students. And also tools to gather this research have based on questionnaire by using inter view and observation, may be considered. Since subject of creativity skill, contains a wide domain of subjective, social and other abilities of an individual, thus it is suggested that with regards to performance of the design in elementary schools, the subject gets held in a more expanded from and with a more general title that could cover higher level abilities in higher grade students. With respect to complexity of creativity structure, in future researches we may consider factors to success in students' creativity abilities in detail till by growing and expanding the ability on education of our students, we act more successful.

## REFERENCES

- [1] Rezaian, A. (2008). principles of management, organization of study and edit of university and human sciences books, 18<sup>th</sup> edit.
- [2] Burton, J, Loveless, a & Turvy, K (2006). developing conceptual farm works for creativity,
- [3] Sadeghi Mal Amiri, Mansoor, Mohabat. (2010). presentation of conceptual model for scaling the creativity. Two monthly publication of police humanistic expansion, Number 30.
- [4] Paulus, p.b. coskun, h (2011). Encyclopedia of creativity, 575-580.
- [5] Turens, pal, (1994), creativity, translator: Hassan Ghasem zadeh, Donyaye now, Tehran.
- [6] Jan Mashayekh, Pari, (2010). Investigation of effects of effect of teacher's behavior style on students' creativity of Kazeron city elementary level. Bibliography of new thoughts in educative sciences, Number 1.
- [7] Erfani, Nasrollah. (2010). cognitive psychology and infracognitive psychology of academic improvement . Hamedan: Fara giran –e sina
- [8] Erol, m. Selcuk, S.g.caliskan, s. (2010) effects of the problem solving perform minces and strategy usage . proscenia social and behavioral sciences , 2,2239-2243.
- [9] Cheragh cheshm, Abbas. (2007). consideration of effect of teaching methodsv based on creativity techniques in students' learning and education. Two bibliography of Islamic education, Number 5.
- [10] Seyf, Ali akbar. (2000). Educative psychology, psychology of learning and education, fifth edition, Agah publications, Tehran.
- [11] ICT and teacher education. Thinking skills and creativity, 1,3-130
- [12] Kreitler, sh. cassakin, h. (2011). The cognitive profile of creativity in design, Thinking skills and creativity, 5, 159-168.