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The study of the effect of centralized planning system on the development of critical thinking in elementary school students

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ABSTRACT

The aim of the present study is to investigate the effect of centralized planning system on the development of critical thinking in elementary school students. This study is an applied one. The population of the study is elementary school students of Kurdistan province (F=10496 and M=10950). The sample of this study was selected according to the nature and characteristics of the target population using multi-stage cluster sampling and stratified sampling procedures. The sample consists of 220 elementary school students. The instrument used in this study was the Watson-Glaser Critical Thinking questionnaire. The results of this study indicate that centralized planning system leads to decreased ability to deduce, decreased ability to infer, deduced ability to interpret, decreased ability in the evaluation of logical reasoning, and decreased ability in the identification of assumptions ($p \leq 0.01$).

Key words: curriculum planning, centralized system, decentralized system, teacher, critical thinking

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INTRODUCTION

The educational systems have begun the different aspects of management into various areas and schools for long time ago; however, the issues of decentralization and centralization have been long time discussions in this regard. Some countries do decentralize their elementary schools organizations. The most amended and revised struggles were subjected to centralization during 1980s; the countries which have been achieved this process including: Austria, Botswana, Chile, Colombia, Cyprus, Ethiopia, Guiana, Japan, Kenya, Madagascar, U.S.A , Malaysia, Morocco, New Zeland, Paraguay, Peru, Republican, Korea, Thailand, Denmark, Great Britain, Poland, Belgium, Netherland [9]. The skills needed for the new century`s life following by educational systems are: problem-solving skills, creative thinking, critical thinking, self-conscious, decision-making, effective relationship, challenging against any oppositions and so forth [17]; having such skills needs a qualitative –based education system and in one hand, the quality of each educational system depends on teachers quality and lesson-planning contents. Today, educational leaders should respond these following questions: What should be learned? How to learn? Why to learn? And they should mostly emphasis on self-judgment and self-controlling issues. In Iran along with the governance of centralized lesson planning system, the results representing the lack of lesson plans success in reacting to the targets in this regard and there are facing with much deficiencies and challenges indicating the performance of Iranian students in international mathematic and sciences examinations and various educational failures at national field . the lack of success or any failure at lesson planning's in centralized systems can originate from various reason such as the assimilation of lesson planning's in national level and the lack of their attention to progression of technological, social, political, fields and cultural, ethnical and geographical as well as various student aptitudes differences [2]. The educational experts believe that schools should not only develop the reading, writhing, and calculating skills to students but also they must learn the scientific realities as well. Applying any scientific facts has a direct relationship with thoughts and thinking ways of students. As a result, teachers need to re-think about their role again focusing on their own activities on training skills, because this leads to nurture student's critical thinking

way. If a teacher treats with critical thinking way skills as cliché or students have been asked to practice in this way, these students would lose their motivations for any analysis of their problems. No doubt that, in a class where educational targets have been early designed precisely, and students activity are just focused on the acceptance and completion of these purposes, these students would not tend to think [16]. In three decades in the world, there was an incredible tendency towards removing centralization in various educational planning. A part of these failures and loses are subjected to the same centralized planning. One of these present deficiencies in lesson-planning with centralized planning supplementation is that the planning process is being achieved in country`s level such as education and higher education organization. In other levels, it does not require any planning and necessary skills or abilities for completing the related work. The same reason cause to decrease the quality of education. In other words, in this system, educational planning's are being prepared as united and cohesive for the whole schools of a country particularly in elementary, guidance and high-school levels [11]. Moore and Parker (1994) explained the critical thinking as the conscious determination, acceptance or rejection or suspended judgment [1]. Watson and Gliyers (1964) considered the critical thinking as beyond of perceptual skills. The critical thinking meaning the combination of attitudes, knowledge's and skills:

A) The attitudes of seeking including the ability of problem recognition , the acceptance of requiring documents and proofs for supporting what has been presented as facts.

B) The existence of knowledge about the correct conclusions nature, abstractions and mentioned knowledge [17]. In Bloom`s et al (1965) theory, the critical thinking requires mind-based superior processes and judgment based on documents and observational. In the other words, it is a kind of problem-solving case. But in addition to problem-solving, it is including some high-level elements meaning the analysis and testing in this regard [13]. The critical thinking is not a linear and step-by-step case but the flexibility of critical thinking let a person apply the related theories, present observations, criteria or students as logically and deductive way to judge about them as well; In other words, a critical expert is the person whose knowledge and decision-making process has been in high potential level. the basic skills of critical thinking is based on Delfi method including representation, analysis, testing, deduction, explanation and self-regulation [7]. Hence, the main purpose of the educational schools is subjected to the nurture of creation and thinking human. The whole lessons of schools must help students to evaluate and analysis the contexts to form critical thinking getting into the field of job and life. The critical thinking makes physical-mental power in persons providing them for the whole competences and challenges in the recent world. In the recent years, the educational experts have started their harsh concern about the disability of subjects in the field of critical thinking. Although the growth of thinking abilities is a complex issue, but today it has been established in a critical situation. Because, the external community data of critical thinking power has been increased about these data. Today the available data is higher than people`s ability; in this case, the role of educational centers as the source of data and teachers as lecturers and transformers of data should be changed and the subjects should also increase their ability instead of keeping data; they should also process the present data and apply in an oriented path as well [2]. According to the fulfilled researches, about 50% of learnt contexts after one year and 80% after two years would be forgotten. These studies suggest in the field of reducing the degree of forgetness that one of the best ways of reducing forgetness is subjected to apply the issues at daily life; that is, what learnt applied in daily life would less be able to forgotten by people (about 15% less forgetness); therefore, when the centralization of the purposes to knowledge`s happened, their application would be highly felt in daily life. Learning is effective when learners can discuss on much topics. Because the expand of teaching abilities require a kind of interaction and feedback among learners. The lectures must be reduced and students should be prepared under approaches through questions. Anyway, the ability of critical thinking depends on teaching methodology and educational patterns and how-to-apply study models; the process of critical thinking takes place when confronting events and situations [16]. Today, schools have taken opportunities out of students and they also never permit learners to apply any thinking ways through their meaningless iterations. In addition, only transferring information is not enough to thinking. But the thinking conditions should be sufficiently constructed. Moreover, thinking is not the ultimate targets, thinking circumstances should be practically transferred to learners. Based on a concrete belief, tendency towards practice is achieved and finally it is leading to the same practice [16, 18]. In a research by the title of "the performance of elementary teachers based on their consciousness of teaching methods and testing", it is concluded that most teachers have enough abilities to apply educational methods as traditional ways signifying the class activities. Rezapour (1999) carried out a research too study the basic lesson books of third-grade elementary level. The method of the research is to analysis the content and community of four lessons books of Persian, natural sciences, religious thoughts and social thoughts at third grade elementary level. He studied the content of the tasks and present questions in the books. The findings indicated that in designing the mentioned lesson books, the creation and thinking factors were not importantly considered. Pasyar and Esteghamat (2009) carried out the degree of applying critical thinking elements in sciences lessons and mathematic books of fifth grade elementary schools. The findings representing that the degree of attention to thinking in science book is higher than mathematic. Ferdowsi (1993) in a part of his research in relation to the lesson contents leading to the lack of attention at schools concluded that in

terms of students perspective, the abstraction of lesson contents, the lack of lessons useful necessity, the lack of lesson cohesion with students purposes and huge volume of the topics were devoted the first ranking to fourth. The process is suitably showing the existence of problems in the choice of books contents. The findings showed that it is necessary to reduce the volume of lesson contents for increasing student's attention towards lesson books. The necessity and usefulness or the application of each lesson should be suitably determined which students can force themselves towards critical and analysis thinking. In another research led by Hashemiannezhad (2001) by the title of "the theoretical framework in relation to lesson planning based on critical thinking in elementary grade with the emphasis on social studies lesson plan", eight skills were considered for critical thinking as following:

1-questions, 2-analysing, 3-evaluation, 4-connection, 5-deduction, 6-organizing the related scientific concepts, 7-using critical words, 8-post recognition for Sratnyk research critical thinking (1993); this is representing the fact that there have been teachers spending their time on speaking or questioning which they are good for nothing and collecting just some simple scientific facts and one percent of their times are devoted to the class atmosphere. Most teachers make their students dismal in responding the questions along with giving the latest opportunity; this kind of situations streams at many classes [17]. The results of the third international mathematics and science study (TIMSS) and the most important designed study (AEI) representing that the expected performance in theoretical analysis and problem-solving at sciences lesson content has been little paid attention in many countries such as Iran, and Scotland [14]. Now according to centralized and non-centralized education and their positive and negative remarks and due to the centralization of Iranian educational system, we are trying to evaluate the effect of the system on critical thinking growth in elementary students determining whether the system of centralized planning could provide the growth of thinking skills in Iran or no.

MATERIALS AND METHODS

This research is of applied type. The statistical community of research includes the whole province elementary fifth graded students (F=10496 and M=10950). The selective sample of the research is clustering sampling method from the selected community including 220 ones elementary grade. The tool of study including the questionnaire of Watson-Glaser critical thinking skills through 80 question in five skill elements of deduction, determining hypotheses, inferential, representing, evaluation and testing. The total score is 80 and the highest score of each subject is 16. The scores can be obtained in different sections of deduction through the correctness or incorrectness of statements, determination of hypotheses with the recognition of pre-assumptions or the lack of them in the related statements, the inferential section is determined by specifying the extracted or distracted results of the situation, in representing and explanations section, the situational descriptions and finally, the evaluation section is subjected to the recognition of strong or weak reasons. In other words, in this test in each correct response, a one score is belonged to another one and total correct responses by test questions would led to he total score (Maximum score 80). Each of the subjects based on the obtained score from the test can be established in one of the categories (lower than 54), moderate (54-59), and strong (60-80), in terms of critical thinking ability. In the categorization of each score, the category score 10 and lower, moderate 11 and strong 12-16 was considered. The necessary time for representing the questions is taken 60 minutes. This test was evaluated to match and organize the Iranian cultural and social factors after translation into Persian language. In the process of standardizations Glaser-Watson critical thinking skills test, the validity coefficient was reported α= 0.70 higher through Iranian various researches [3]. Also, in another study led by Eslami and Moarefi (2010), the reliability of the test was t=0.4 in this regard. To study the research questions, single-sample test "Z" was applied. The logic of applying the test "Z" is that any sample comparison with mean community and N≥30 was used efficiently; also, the side findings used the multiple-variance analysis method.

RESULTS

Table 1. The descriptive indices of elementary graded students in the factors of critical thinking skills test.

Variables	Mean	St Err.	Mid	Dev	Min	Max
Deduction	3.805	0.122	4	1.7938	0	9
Assumptions identification	3.013	0.1034	3	1.4894	0	9
Inference	3.1667	0.0941	3	1.3843	0	8
Interpretation	3.888	0.929	3	1.3662	0	7
Evaluation of logical arguments	3.097	0.0844	3	1.2407	0	7
Total	17.1727	0.4830	17	7.1015	8	27

Table 1 shows the descriptive indices of elementary students in critical thinking skills; as shown in the table, the mean standard error, mid, deviation, minimum and maximum for each skills have been stated which the mean explanation skill is the highest skill with 3.888, but the lowest with 3.013 is subjected to determining hypotheses skill. The descriptive indices for total critical thinking of elementary students was that the mean (17.1727), mean

standard error (0,483), middle (17), deviation (7.1015) and minimum (8) and maximum (27) were obtained. In this section, the effect of centralized education on critical thinking growth at elementary students was evaluated and then each elements of critical thinking was also assessed at elementary grade.

In order to study the hypothesis of the research, the single-sample Z-test statistically was applied. The process is that a mean norm in critical thinking test led by Glaser-Watson has been considered as the mean normal population in the variable of thinking which it has been also established as the community assumptive mean comparing the obtained mean of students in the research. If the difference was significant in relation to be larger than assumption mean but the hypothesis is rejected. The results of single-sample Z-test for the study of the hypothesis is reported in Table 2:

Table 2. The results of single-sample Z-test for the significance of elementary critical thinking

Variable indices	N	Mean	Z	Mean community assumption	Mean	Sig
Critical thinking of elementary students	220	17.17	12.07	0.5000	23	0.000

As shown in the table, the obtained Z for student's critical thinking equals 12.07 with significance level 0.000 at P≤0.01; therefore, the hypothesis zero is rejected. Therefore, according to the mean of the subjects (17.17) and its comparison with mean community assumption (23), it can be concluded that the obtained mean from the mean community assumption is lower significantly and twelfth assumption at inverse direction is significant in level 0.01: hence, it can be stated that the centralized system on critical thinking growth has negative effect on elementary students; that is, it reduces the critical thinking among elementary students.

Deduction ability:

To say the element of deduction ability of elementary students, the single-test Z and statistical method was applied; a mean in the norm of Glaser-Watson critical thinking is considered as the critical thinking variable and the obtained mean from the students of the research was compared together; while the difference in relation to enlarger than assumptive mean is significant reaching to the confirmation or it would be rejected. The results of single-sample "Z" test are given in Table 3:

Table 3. The results of single-test Z for the significance of elementary student's deduction abilities

Variable indices	N	Mean	Z	Dev	Mean community assumption	Sig
Deduction ability of students	220	3.8056	9.78	0.5000	5	0.000

As shown in the table, the obtained "Z" for the students deductive ability equals 9.78 with sig level 0.000 at level 0.01 is being significant (P≤0.01) as a result, the zero hypothesis representing the mean differences is rejected; hence, according to the mean of the subjects (3.077) and it's comparison with mean community hypothesis (5), it can be concluded that the obtained mean from the mean community assumption is lower significantly and 12th assumption at inverse direction is significant in level 0.01; hence, it can be stated that the centralized education system on critical thinking growth has negative effect on elementary students; that is, it reduces the critical thinking among elementary students.

The ability of determining hypothesis:

To study the element of the determining hypothesis, the single-test Z was used; a mean in the norm of Glaser-Watson critical thinking is considered as the critical thinking variable and the obtained mean from students of the study was compared together; while, the differences in relation to enlarger than assumptive mean is significant reaching to the confirmation or it would be rejected. The results of single-test "Z" are given in Table 4.

Table 4. The results of single-test "Z" for the significance of determining hypothesis ability

Variable indices	N	Mean	Z	Dev	Mean community assumption	Sig
Ability of Assumptions identification	220	3.0139	19.59	0.5000	5	0.000

Conclusion ability:

To study the element of conclusion, the single-test z was used; a mean is the norm of Glyers-Watson critical thinking is considered as the critical variable and the obtained mean from students of the study was compared together; while, the difference in relation to enlarger than assumptive mean is significant reaching to the confirmation or it would be rejected. The results of single-test z for studying the hypothesis are given in table 5.

Table 5. The result of single-test Z for the significant of conclusion ability

Variable indices	N	Mean	Z	Dev	Mean community hypothesis	Sig
Ability of interpretation	220	3.1667	20.37	0.5000	5	0.000

As shown in the table, obtained "Z" for the conclusion ability of the students equals -20.37 and with 0.000 significance level at 0.01 ($P \leq 0.01$). As a result, the zero hypotheses representing the lack of difference mean is rejected; hence, according to the mean of the subjects (3.1667) and its comparison with mean community hypothesis (5), it can be concluded that the obtained mean from the mean community hypothesis is lower significantly and the hypothesis in inverse direction is significant at 0.01 levels. Therefore, it can be stated that the centralized educational system on conclusion ability of elementary students has a negative effect. That is planning of centralized educational system leads to decrease the ability of conclusion among elementary students.

Representation and explanation ability:

To study the element of representation and explanation ability, the single-test Z statistical method was used efficiently; a mean in the norm of critical thinking of Glaser-Watson was considered as the normal population mean and the obtained mean from the students of the study was compared together; while, the difference in relation to enlarger than assumptive mean is significant reaching to confirm or reject the hypothesis. The result of the single-test "Z" are given in table 6:

Table 6. The result of single-test Z for the significant of interpretation ability

Variable indices	N	Mean	Z	Dev	Mean community hypothesis	Sig
Representation and explanation ability	220	2.888	22.07	0.5000	5	0.000

As shown in the table, the obtained Z for the related ability equals 22.07 and with 0.000 significance level at $P \leq 0.01$ significant degree. As a result, the zero hypothesis representing the means difference is rejected; hence, due to the mean subjects (2.8889) and its comparison with mean community hypothesis (5), it can be concluded that the obtained mean from the mean community hypothesis is significantly low and the hypothesis in inverse direction is significant at 0.01 levels. Therefore, it can be stated that the centralized educational system on the growth of representation and explanation ability has a negative impact on the elementary students. That is, the centralized educational planning leads to reduce the related ability among elementary students.

The ability of evaluating logical proofs:

To study the related element, the statistical single-test Z was used; a mean in the norm of Glaser-Watson critical thinking was considered as the normal population in the critical variable and mean community hypothesis; the obtained mean from the students was compared together. While, the difference in relation to enlarger than mean hypothesis is significant reaching to the confirmation or rejection of the hypothesis. The results of single-test Z are given in table 7:

Table 7. The result of single-test Z for the significant of Logical proofs ability

Variable indices	No	Mean	Z	Dev	Mean Community hypothesis	Sig
Logical proofs ability	220	3.0972	22.53	0.5000	5	0.000

As shown in the table, the obtained Z for the logical proof ability equals 22.53 and with 0.000 at 0.01 significant level. ($P \leq 0.01$). as a result, the zero hypothesis representing the lack of means difference is rejected; hence, due to the subjects mean (3.4409) and its comparison with mean community hypothesis (5), it can be concluded that the obtained mean from the mean community hypothesis is significantly low and the hypothesis in reverse direction is significant at 0.01 level. Therefore, it can be stated that the centralized educational system has a negative effect on the ability of logical conclusions among elementary students. That is, the centralized educational system cause to the reduction of logical conclusion ability of students.

Side Results:

Table 8. The line test to establish the variances in the elements of critical thinking at both groups

Variables	F	Df	Df	Sig
Analysis	5.85	1	214	0.16
Evaluation	0.18	1	214	0.67
Inference	3.84	1	214	0.06
Analogy	0.18	1	214	0.66
Induction	0.11	1	214	0.73

As shown in line test table, the degree of statistics F is not significant in the whole variables representing the fact that groups variance are equal together in critical elements.

Table 9. The table of group's multi-variable variance analysis confirmation

Effect	value	F	Df	Sig
Phillai effect	0.05	2.21	5	0.06
Lmbadai	0.95	2.21	5	0.06
Vilkez	0.05	2.21	5	0.06
Hoteling effect The largest root	0.05	2.21	5	0.06

As shown in the table, the degree of Lambadai, Vilkez 0.95 significantly, which represent there are no any significant differences among boys and girls in critical thinking.

Table 10. the analysis of multi-variable variance between girls and boys of elementary school in terms of critical thinking

Reference	Scales	Mean squares	Df	Mean squares	F	sig
Groups	Analysis	31.13	1	31.13	10.08	0.41
	Evaluation	0.11	1	0.11	0.05	0.82
	Inference	0.46	1	0.46	0.24	0.62
	Analogy	0.46	1	0.46	0.24	0.62
	Induction	1.04	1	1.04	0.67	0.41

As shown in table 10, it is observed that the centralized educational system has an effect on the critical thinking growth of boy and girl elementary students at $P \geq 0.05$ level. In other words, the centralized educational system is not different on the growth of boys and girls critical thinking.

DISCUSSION AND CONCLUSION

The results show that the centralized educational thinking has a negative effect on the critical thinking of elementary students. The results also indicate that the centralized educational thinking cause to the reduction of conclusion, deduction, explanation, logical conclusion evaluation and determination of hypothesis abilities; and also, no any significant difference found in the critical thinking among boys and girls. The educational method should be aimed at the participation of students activity, speech freedom, and the growth of critical thinking, observation and analysis ability, objective reality, common thinking power and responsibility awarding of needs and social hidden mechanisms; the main external critical thinking at education is the appearance of thinking process and students sophisticated traits as the skill aspects at educational fields; but unfortunately, today schools have taken out enough opportunities from students to get accustomed of practicing issues and this kind of transmission is not sufficient; in addition, thinking is not the ultimate target and learners should get the accurate thinking methods. Due to the fixed belief, the tendency towards practice leading to fulfill the action; but unfortunately the early and present results showed that the Iranian educational planning could not make students to reach to granted function of critical thinking skills, and this has also negative effect on the students. The results of the study are coincident with these researches: Rezapour's (1999) study for the study of lesson books at third elementary level; the method of the study is based on four lesson books of farsi, natural sciences, religious thoughts and social studies in third elementary grade.

He also studied the content of the tasks and the present questions in the related books. The findings indicated that in designing the related books, the related factors of creation and external thinking are not been considered. Pasyar and Esteghamat (2009) carried out the degree of applying critical thinking elements in fifth graded elementary school. The study findings representing the fact that the degree of thinking in sciences book is better than mathematic books and the lack of any planning in schools is subjected to teaching method and lesson books. In another study led by Hashemiannezhad (2001) by the title of "giving theoretical framework in relation to lesson planning based on critical thinking in elementary grades, eight skills were considered as following:

1)Questioning, 2) analysis, 3) evaluation, 4) connection, 5) deduction, 6) organizing scientific concepts, 7) applying critical words, 8) hyper-recognition.

For Tajik's critical thinking (2003), they concluded that most teachers have got enough abilities to use them as traditionally at their class surroundings. Maleki and Habibpour (2007) concluded at their study that the experts of education emphasis on the growth of thinking importance as the main purpose of the education. Based on the fact, the educational system must provide the necessary opportunities for student instead of transition of data particularly in the field of critical thinking. There should be taught theoretically and practically.

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