

Survey on High School Curriculum Structure for Development of Individual and Group Creativity in Learning Process

Maryam Afzalkhani

Department of Educational Sciences,
Garmsar Branch, Islamic Azad University, Garmsar, Iran

Abstract: The present research has developed to investigate the curriculum planning in Iranian high schools. More attention paid to creativity elements from the viewpoint of professors and experts in curriculum planning. This research based on statistical community, which is composed of professors, instructors and experts in curriculum planning (Total sample size of 104 persons). The tools for correcting data were feedback from researcher and completed questionnaires. In data analysis SPSS software, for each sample descriptive statistics, the frequency tables and inferring statistics, three tests for mean equality, Levin, F and Duncan are used. The results indicated that applying creative approaches in high schools' curriculums has an unfavorable and downward tendency. In addition, the rate of addressing the components of creativity for individuals and group elements had a downward tendency. Therefore, promoting high schools curriculums (intermediate programs) may lead to creative planning. The obtained results served as guidelines for development high schools creative curriculum.

Key words: Creative Planning % Iranian High Schools % Curriculum Development % Student Creativity % Statistical Analysis

INTRODUCTION

Hajizad [1] has conducted a survey on bases of human and basic sciences among 255 students and 150 teachers in Behshahr junior high school to evaluate professional relationships between high school teachers and students' creativity. His evaluation was much concern about professional education not on creativity of students as product of educational system. Renzulli and Reis [2] have presented a pattern of enrichment for students' educational programs. They have emphasized on development of creativity in schools and thought the role of teacher as a educational consultant. In addition, they have found a model for the growth of creativity should be play very important role. In their investigation noted that, teachers' motivation and interest in their job is critical and crucial in an optimum learning process. In their proposed pattern, the following goals are considered:

- ⊆ Motivating and promoting creativity in talented students;
- ⊆ Improving the quality of education and developing the domain of enrichment of regular educational programming and.
- ⊆ Developing cooperation instead of competition among teachers and employees who participate in the educational program.

It was believed that the proposed pattern was frequently revised and corrected. The revision of pattern was emphasized on opportunity to experience learning should be provided to all students; in order to fit student personal abilities, interests and the learning method [2].

In an independent research with the aim of environmental and personal impacts, Niu [3] has investigated among 357 high school students. He has found that both environmental and personal factors absolutely played an important role in students'

creativity. The impact of environmental factors which are related to mechanisms have an undeniable role in forming creativity.

Theories regarding teachers' conceptions of creativity and creative students have been introduced by Guilford, Debono, Sternberg, Amabil and many more research scientists while they have emphasized on personal aspects of creativity and related concepts to educational aspects [4-10]. The creativity in personal dimension (ability and personality characteristic) under the influence of education and in particular, ability to innovate may be enhanced [11, 12].

Sternberg has conducted a research on 110 students; he has concluded that impact of teaching creativity referred to cognitive and personality characteristics of students [7]. James *et al.* [13] also have concluded that among 41 students in formation of creativity, cognitive skills and personality characteristics have mutual interactions.

Maker *et al.* [14] have investigated impact of discovery of educational programs on elementary school students. Analysis of results showed that active learning, selecting curriculum by students, having access to different sources, discovery, self-assessment, finding problems and problem solving (the elements of discovery of educational programs) may significantly increase creativity in students.

Rojas-Drummond *et al.* [15] in their experimental studies on pre-test and post-test, have investigated impact of using new teaching methods such as cooperative learning [participatory learning], teaching critical thinking and exploratory talking (ET) on children. The results in post-test showed that meaningful increase in students' creativity. Aljughaiman and Mowrer-Reynolds [10] have believed that the concepts of generating creative students may required series of standard tests. Creativity is not isolation, seclusion, as it is inside of individuals' brains; in fact, creativity must happen in interaction of an individual with his/her cultural society. In addition, researches have been performed which indicate the group factors are of the most important and pervasive effective factors in students' creativity. Yetton and Bottger, Amabil, Shalley and Gilson, Sengh, Koontz *et al.* [4, 11, 16-18] have believed that the group factors play critical roles in creativity.

Torrance [19] has believed that creativity is a method that uses recognition, imagination and assessment to discover fact, problems, concepts, as a sort of method acceptable to solve problem, known as the creative

method to solve problems. Now, in most cases, creativity has built through derivative of Guilford's intelligence structure mode. Also Torrance [19], while criticizing traditional education system, emphasize on the importance of changes in traditional curriculums and directing education toward creative programs. He has believed that in order to achieve this goal, we must enrich educational environment and present creative programs. The purpose of present research was to investigate the structure of high school curriculum to pave the road for creativity. In order to promote high school curriculum planning with the aim of creating creativity and integrating the basic pivots of curriculum with creativity components are considered. In line with this idea, identification and a comprehensive understanding of the creativity components are considered. Basic approaches of curriculum planning may lead to diverse views of curriculum.

The basic research questions would be; what kinds of approaches considered in curriculum planning of high schools? To what extent, the components of creativity are noticed in curriculum planning of high schools: Individual components: capability (intelligence, technical skills, working knowledge), personality features (flexibility, risk taking, ambiguity, independence seeking, self-confidence, hardworking and resistance, having a strong image of one is being creative) and collective components (group coherence, group diversity, system of group communication).

MATERIALS AND METHODS

Considering the goal of research, the research methodology is a field research.

Examinees: The statistical community is composed of all professors, instructors and experts of curriculum programming and authors of high schools' curriculums (population size of 104 individuals). With regard to the limit of the community under consideration, the whole community forms the sample volume of this research.

Instruments: The data collected by researcher-made questionnaires and using library sources. For the purpose of investigation; main principles of curriculum programming and creativity components, based on theoretical principles obtained from literatures. An organized questionnaire was prepared considering personal characteristics, approaches of curriculum (social human, subject centeredness, development of

cognitive processes, competency centeredness, student centeredness, transferring cultural heritage, spiritualism, humanism) as well as curriculum making approaches based on patterns and views in curriculum design and also components of creativity (personal, group and organization based).

It is worth mention that in designing questionnaire, the options designed such that investigate the rate of applying the approaches of creativity and rate of providing the grounds for creativity components in high school curriculum regarding suitability of curriculum of this level for creativity in 5 levels including: very much, much, average, little and very little.

Out of all collected questionnaires, 92 questionnaires were complete and analyzed. Therefore, necessary data collected and through their analysis, the rate of tendency of high school curriculum programming toward creativity detection. After required examinations and using library data obtained from the analysis of different patterns of curriculum programming and creativity, a guide for designing curriculum for creativity provided.

Validity and Reliability of Instruments: For test validity, the content validity method was applied. Since the designed questionnaire was based on known theories, models of educational program and personal, group and organizational components of creativity and the narrations are directly obtained from theories and models, it can be said that it has a suitable content validity.

In addition, from the ideas of educational programming experts were benefited. In order to investigate the rate of reliability of questionnaire, Cronbach's Alpha Coefficient was used. Micro scales of questionnaire in the field of curriculum approaches and methods, personal component of creativity, group component of creativity were estimated 90, 89 and 89, respectively.

In this research, with regard to determined goals, the descriptive and inferential statistics were used. In order to describe variables, descriptive statistics were used including percent, frequent distribution, table, mean and standard deviation. For analyzing data, the mean equality test, Levin test, F-test and Duncan test in first part of questionnaire and for the second part t-test for each sample was implemented.

It is worth to note that the rate of error risk in this research (Alpha) (from the viewpoint of precise indexes in determining sample volume, selection method and validation of data collection instruments) in the application of approaches and attitudes was considered 0.001 and in respect of paying attention to creativity components was considered to be 0.05.

RESULTS

Conducted analysis indicates that the rate of application of different approaches in design and compilation of high school curriculum of new educational system as follows:

The rate of reported statistics of F was 16.17 with a meaningfulness of less than 0.001 and it is concluded that the means of approaches have a meaningful difference with each other. Now in order to discover priorities of approaches, Duncan Table 1 demonstrate statistical analysis. The designed test based on pair comparison of the means of approaches.

In this Table 1, at first, the approaches organized from top to down order based on the mean number in ascending order and then divided to several groups according to their difference significance.

Here, group one, which relates to approaches with a little mean, includes “development of cognitive processes, student centeredness, social human and humanism”. Mean number of those approaches is

Table 1: Duncan

Approaches	N	Subset for alpha = 0.05			
		1	2	3	4
Development of cognitive processes	92	2.5435			
Student centeredness	92	2.5435			
Social human	92	2.6848			
Humanism	92	2.6848			
Transfer of cultural heritage	92		3.0217		
Competency centeredness	92		3.0761		
Subject centeredness	92			3.3587	
Spiritualism	92				3.6522
Sig.		0.374	0.703	1.000	1.000

2.54 to 2.68. This mean number indicates a rate less than average (number 3), which means these approaches have been almost less applied.

The second group (or the second priority) includes cultural heritage transfer and competency centeredness approaches that respectively have the mean of 3.02 and 3.07, which means these approaches applied on average level.

The third group (third priority), subject centeredness holds the third rank priority with a mean of 3.35. It shows that the subject-centeredness applied in a rate more than average level.

The fourth group (the fourth priority) allocated to spiritualism with the rate of 3.65, which applied in nearly much scale.

In total, it can be said that the rates of application of mentioned approaches are as follows: spiritualism: (high), subject centeredness: (more than average), cultural heritage transfer and competency centeredness: (average) and cognitive processes development, student centeredness, social human and humanism (low).

Conducted Analysis Regarding Enhancement of Creativity in High Schools' Curriculums Indicated the Following Results:

- C Regarding item of <<intelligence>>, its level has been as follows: in 59.8%; (low and very low), in 28.3 %: (average) and in 12 %: (high). The mean value of intelligence is 2.37 with a 0.89 standard deviation and statistical test obtained in significance level more than 0.05. Thus, one has to pay attention to intelligence from individual aspect of creativity in high school curriculum tends to a low and downward level.
- C Regarding item of <<working knowledge>>, it has been in 41.3 %: (low and very low), in 45.7%: (average), in 13.1 %: (high and very high). The mean value of working knowledge is 2.7 with a 0.81 standard deviation and statistical test obtained more than 0.05, significance level. Therefore, it is required to pay attention to working knowledge from individual dimension of creativity in high school curriculum that tends to be an average level.
- C Regarding item of <<technical skill>>, we have: in 59.8 %: (low and very low), in 30.4 %: (average) and in 9.8 %: (high and very high). The mean value of technical skill is 2.35 with 0.93 standard deviation and statistical test was obtained in more than 0.05 significance level. Also, special attention is

required to technical skill from individual aspect of creativity in high school curriculum; that tends to be low and downward level.

Based on Performed Analysis in High School Curriculum the Rate of Provided Conditions for Reinforcing Creativity in All Aspects of Personality Features Are as Follows:

- C Regarding item of <<self-confidence>>, it has been in 56.5 %: (low and very low), in 30.4 %: (average), in 13.1 %: (high and very high). The mean value of self-confidence was 2.46 with 0.96 standard deviation and statistical test was obtained in more than 0.05 significance level. One has to pay attention to self-confidence from personality aspect of creativity in high school curriculum; that tends to be low and downward level.
- C Concerning item of <<need for success>>, we had the following rates: in 63 %: (low and very low), in 28.3%: (average), in 8.7 %: (high and very high). The mean value of need for success was 2.33 with 0.89 standard deviation that shows statistical test obtained with more than 0.05 standard deviation. Therefore, stated that need for success from personality aspect of creativity in high school curriculum tends to be downward and low level.
- C About item of <<risk taking>>, the following rates were obtained: in 68.4 %: (low and very low), in 25%: (average), in 6.5 %: (high and very high). The mean value of risk taking was 2.18 with 0.9 standard deviation. Statistical test obtained in more than 0.05 significance level and it is stated that the degree of addressing risk-taking parameter from personality aspect of creativity in high school curriculum tends to be downward and very low level.
- C With respect to item of <<perseverance and resistance>>, following rates were obtained: in 66.3 %: (low and very low), in 48.9%, 25 %: (average) and in 8.7 %: (high). The mean value of perseverance and resistance was 2.25 with 0.85 standard deviation and statistical test was obtained in more than 0.05 significance level. Therefore, one has to pay attention to item of perseverance and resistance from personality aspect of creativity in high school curriculum tends to be downward and very low level.
- C Considering item of <<a strong image of one's creativity>>, we obtained the following rates: in 62%: (low and very low), in 30.4% (average) and in 7.6%: (high). The mean value of a strong image of one's

Table 2: The scale of creativity application components in high school curriculum

Creativity components	Mean value	Standard deviation of statistical test	Significance level
Capability	2.47	0.74 6.82	> 0.05
Personality properties	2.25	0.73 9.87	> 0.05
Group based	2.34	0.74 7.77	> 0.05

creativity was 2.27 with a 0.85 standard deviation. Statistical test obtained in more than 0.05 significance level. Also, degree of paying attention to item of <<a strong image of one's creativity>> from personality aspect of creativity in high school curriculum tends to be downward and very low level.

- C Regarding item of <<ambiguous quality>> the following rates were obtained: in 69.6 %: (low and very low), in 21.7%: (average) and in 8.7 %: (high). The mean value of ambiguous quality was 2.11 with 0.92 standard deviation and statistical test was more than 0.05 significance level. Then degree of addressing ambiguous quality from personality aspect of creativity in high school curriculum tends to be downward and very low level.
- C Regarding item of <<independency and freedom>>, following rates were obtained: in 68.5 %: (low and very low), in 26.1 %: (average) and in 5.4 %: (high). The mean value of independency and freedom was 2.12 with 0.85 standard deviation and statistical test obtained more than 0.05 significance level. One has to pay attention to independency and freedom from personality aspect of creativity in high school curriculum tends to be downward and very low level.
- C Conducted analysis regarding enhancement of creativity in-group aspect indicated that about the item of <<group diversity>> the following rates were obtained: in 54.3 %: (low and very low), in 32.6 %: (average) and in 13.1 %: (high and very high). The mean of this item was 2.47 with 0.94 standard deviation. Statistical test obtained more than 0.05 significance level, it needs special attention to group diversity from group aspect of creativity in high school curriculum tends to be low and downward level.
- C Regarding the item of <<group coherence>>, the following rates were obtained: in 62.3 %: (low and very low), in 27.53 %: (average) and in 10.16 %: (high and very high). The mean value of group

coherence was 2.33 with 0.86 standard deviation and statistical test obtained more than 0.05 significance level. Also special attention needs for group coherence from group aspect of creativity in high school curriculum tends to be downward and very low level.

- C Regarding the item of <<communication system>>, the following rates were obtained: in 55.95 %: (low and very low, in 29.9%: average and in 14.15%: high and very high. The mean value of communication system was 2.46 with 0.89 standard deviation that indicates the mean value of this item was low and distribution of sample ideas compared to the mean value was high. Statistical test obtained more than 0.05 significance level, then the degree of paying attention to communication system from group aspect of creativity in high school curriculum tends to be downward and very low level.

DISCUSSIONS

As it was stated in part of findings, one of the most important results of the present research was to investigate method of approaches of curriculum planning in which application of spiritualism; subject-centeredness has been significantly high; whereas application of approaches of development of cognitive processes, student-centeredness, social human and humanism has been at a low level. Considering the above results, it is necessary to prepare conditions for the conscious use of approaches with regard to their weak points and strengths. Subject-centeredness approach has been dominated approach in most of high schools and universities. Here, the emphasis is on subject of textbooks and the way that subject has been developed and organized. According to obtained results, the above approach emphasized; there is no room left for having a hope in preparing grounds for creativity.

According to Miller [20], social approach in curriculum planning has three sub-sets or sub-viewpoints: i. cultural transfer, ii. Democracy-based citizens and iii. social changes. The social re-constructors categorized in the third viewpoint. This approach emphasize on social experience. Such point of view on society is very strong, that is as a base to adjust curriculum [20]. Unfortunately, the obtained results showed that the social approach meaningfully noticed at a very low level.

The student-centered approach based on individual's needs and interests/activities. In this approach, the interests and needs of learners and flexibility of curriculum emphasized and the learners are individually under consultation and education in proper opportunities [14, 21, 22]. This issue paved the road for flourishing creativity. However, the results of present research showed that this approach meaningfully noticed at a very low level and this is very disappointing.

Cognitive approach focused on developing cognitive skills such as problem solving. As Miller [20] stated that curriculum is fully process-centered and focused on observance, analysis, combination and evaluation as much as other rational skills. In contrary about rational skills, which are developed in disciplined approach? Generally, skills are not necessarily developed in texture of a specific discipline but they are formed on a specific obligation or issues such as problem solving and development of skills by which it can cultivate problems and it has been noticed as alternative solutions. Overall, it focuses on taking consequent steps in the process. In this approach, the development of rational power of human is one of the main goals and has a key role in emergence of creativity. Unfortunately, according to obtained results, application of such approach had significantly at a very low level.

In humanistic approach defined by Miller [20] materialization itself is the basic goal of many human-oriented programs. On this basis, knowing the approaches of curriculum planning and their conscious use is an important component in preparing grounds for creativity in structure of planning of high schools. According to obtained results, employing such approach had significantly at a very low level. Another finding of present research was direction of curriculum planning. In other words, the presence of direction of development of cognitive processes and student-centeredness, which have outstanding role in paving ground for creativity. This is emphasized by curriculum researcher was very fade in high schools.

In high schools curriculum development, reinforcement of creativity in dimension of capability (knowledge, technical skills and intelligence) has been dealt with a very low level. In order to reinforce this component, it is possible to place students in those fields, which he/she loves and feel of joy while doing it. The fields, which are so attractive and prevents them from feeling exhausted and the fields in which they can immerse and ignore the time. Efforts should be carried out to make student enjoy sufficient theoretical and experimental knowledge. They were able to use their learning through education and experience. In addition, students may have opportunity and ability to use equipments related to their theoretical work. At the same time, many research scientists have also emphasized on the above mentioned points in reinforcement of individual dimension [2, 4, 13-15, 23-33]. They have believed that individual factors play a critical role in students' creativity in which the environmental impacts and its related mechanisms have undeniable role in forming creativity. They have stated that cognitive field includes knowledge, skills of reasoning, technical skills and special talent and are in mind that being successful. The success depends on suitable curriculum, experience and abilities of learner and selecting curriculum by students, having access to different sources, discovery, self-assessment, finding the problem and problem solving should significantly enhance students' creativity. Curriculum programmers, teachers and learners must pay attention to those rules.

Also theories initiated by Guilford, Debono, Sternberg, Amabil [4-9] emphasized on individual aspects of creativity refer to its educational aspects. Reviewing literature defined that creativity in individual aspect (capability and personality characteristics) may increase under the influence of training, particularly ability to innovate will find a specific rise. One of the research finding was curriculum of high schools has given a low attention to creativity reinforcement in dimension of personality characteristics. Results of present work is consistent with the results obtained by other investigators with the aim of investigating the relationship between high schools' education with students' creativity. It was demonstrated that educations presented in high school have been not considered growth of abilities of creativity and flexibility of students [1, 21].

It is possible to design curriculum courses based on independence and freedom; selection of type of job, method and time of performing (independency), flexibility capability to face unknown situations, considering

ambiguity quality as an opportunity (ambiguity) and having an image of self as an creative person, long term commitment to make one's dreams into practice. The designed curriculum should solve complex studying issues, spending intensive energy and time. In this path, as much as needed (hard working) and lack of fear from defeats and viewing them as opportunities for learning (risk taking) and selecting, performing challenging activities and accepting responsibility for achievements and defeats, thinking on doing academic activities much efficient. Self confidence is on one's abilities in performing duties (self confidence).

The long-term research conducted by Amabil [4, 9] showed that even if these characteristics do not exist naturally, it is possible to grow them even in adults. At the same time, thinkers like Nelson and Quick, Harris, Sutton, Dacey and Lennon, James *et al.*, Mackinnon, Amabile and Niu have believed that personality factors play a critical role in creativity [3, 9, 13, 34-38].

One of the important results of present research on high school curriculum was creativity reinforcement, which has significantly received low attention from the group perspective; whereas, it is possible to set up the system of communication among students for curriculum development as they can discuss and exchange views on their studies and findings. Furthermore, students could refer to scientific and cultural centers outside school and they be able to use sources apart from their textbooks. They could have easy and fast access to information needed inside and outside educational system. They can establish face-to-face and free contact with people among their group. It should be often clear as people of their group having common goal and vision like each other. The levels of abilities of individuals to be close to each other and the group members can help each other in particular at difficult time. Each member respects unique views of other members and these groups could be divided into small groups. Students could join groups with different scientific expertise and also able to participate in-group activities. In addition to the fact stated above, teacher and student perception of creativity in the classroom environment is a creative production; extensive work is needed to reveal the existing facts on creativity [10, 22, 39, 40]. Creativity is not understood by individuals' isolation and as it is inside the thoughts and brains of persons. In fact, the creativity must happen in interactions of individual with his/her cultural society. Also, Yetton and Bottger, Amabile, Shalley and Gilson [4, 9, 11, 17] have believed that group factors play a critical role in creativity.

Perkins [41] has suggested the concept of opening a way for nurturing the components of creativity. In his method, he has defined four certain questions based on objective, structure and type of model and views for or against it. Other methods such as brain storming, explanation and commentaries, novelty, are stimulating starters or facilitators of creativity nurturing. It is q unique as an individual can apply a kind of creativity in process of his activities in purposeful activities such as problem solving, decision making or concept creation. Overall, the approaches and trends of curriculum besides components of creativity in different scientific fields should be developed in a variety of methods. It is not possible to issue a fixed instruction for education of creativity in all fields. But, most of the experts are agreed that the components of creativity can be best grown through discussion, exchange of ideas and problem solving [42].

For the inclusion of creative approaches in curriculum of high schools, there is a need to preparation of proper opportunities for teaching creativity growth and creation of such a framework will need time, thinking, design, practice and stimulating opportunities. Integration of creative approaches and attitudes with individual and group components of creativity can help enrichment of high school curriculums. This may need a regular and coherent framework. Such framework cannot be nurtured by intensive educational programs, large classes, limited time and expanded contents and at the same time condensed and complex.

CONCLUSION AND SUGGESTIONS

From present research, it is necessary to consider elements of curriculum ranging from goal, content and assessment to teacher, student, time and place of creativity components in order to have the prevailing trends in curriculum moved towards creative stands.

It was concluded that the application of creativity-oriented approaches in high school tend to low and downward level. It is suggested to all experts of high school curriculum and authors of the high school textbooks pay attention to this important point in paving ground for creativity and include it in compiling high school curriculum.

Considering the findings of present research that individual component of creativity including capability and personality features such as: intelligence, theoretical knowledge, technical skill, risk taking, ambiguous quality, strong image of one's creativity,

independence, flexibility, perseverance and resistance, self confidence and need to success. It is requested to promote and incorporate the above-mentioned features of creativity in design and development of high school curriculum.

The obtained results from group components influencing creativity showed that there was no sufficient focus on creativity and it is suggested that to include in agenda of experts and authors of high school curriculum. The results of present research on individual and group components may need special attention and to be considered for high school curriculum planning. It is proposed that to replace the traditional teaching methods with the advanced teaching methods to pave the road for nurturing creativity in individual and group components.

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