# Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosoffa, Lingüistica y Semiolótca, Problemas de IDesarradio, la Ciencia y la Tecnología

Afio 35, Abril 2019 Nº

sten de Ciencias Humanas y Sociales l 1012.1587/ ISSNet 2477-9335



Universidad del Zulia Facultad Experimental de Ciencias Departamento de Ciencias Humanas Maracaibo - Venezuela

Opción, Año 35, No. 88 (2019): 1037-1059 ISSN 1012-1587 / ISSNe: 2477-9385

# Formation Of Aesthetic Consciousness Of 5-9 Class' Schoolchildren

Gulmira Dayirbekova<sup>1</sup>, Gulnar Mussabekova<sup>2</sup>, Serik Dayirbekov<sup>3</sup>, Gulzhamal Jumadillayeva<sup>4</sup>, Nurlan Babayev<sup>5</sup>

<sup>1</sup>Secondary school No. 59 of Shymkent city. Email: daiyrbekova-gulmira@mail.ru

<sup>2</sup>"Syrdariya" University, 11 M. Auyezova str., Zhetysay, 160500, the Republic of Kazakhstan. Email: <a href="mailto:gulnar.hanum22@mail.ru">gulnar.hanum22@mail.ru</a>

3"Syrdariya" University, 11 M. Auyezova str., Zhetysay, 160500, the Republic of Kazakhstan.
Email: dairbekov-serik@mail.ru

<sup>4</sup>Regional social-innovational university. 160005, Shymkent city, D. Kurmanbekov Street. Email: 1965guleke@mail.ru

<sup>5</sup>Regional social-innovational university. 160000, Shymkent city, Tereshkova Street 14. Email: nurbab@mail.ru

### Abstract

The main objective of education is not only to achieve the formations of knowledge, skills and abilities, but also the formation of the pupil identity as the active citizen of the society. The leading method of the research is the modeling, allowing to consider this problem as the process of purposeful and conscious formation of aesthetic consciousness. As a result, after the forming experiment at schoolchildren: aesthetic consciousness was developed. In conclusion, schoolchildren have to be able to find necessary and suitable information for it, and for its independent development, they have to master various techniques and ways.

Recibido: 30-12-2018 • Aceptado: 19-03-2019

**Keywords**: Formation, Aesthetic Consciousness, Schoolchildren, Projects.

# Formación de la conciencia estética de escolares de 5 a 9 años de edad

### Resumen

El objetivo principal de la educación no es solo lograr las formaciones de conocimiento, habilidades y habilidades, sino también la formación de la identidad del alumno como ciudadano activo de la sociedad. El método principal de la investigación es el modelado, que permite considerar este problema como el proceso de formación consciente y decidida de la conciencia estética. Como resultado, después del experimento de formación en escolares, se desarrolló la conciencia estética. En conclusión, los escolares tienen que poder encontrar la información necesaria y adecuada para ella, y para su desarrollo independiente, deben dominar varias técnicas y formas.

Palabras clave: formación, conciencia estética, escolares, proyectos.

### 1. INTRODUCTION

It is clear, that the spiritual world of the separate people, first of all, is shown in its traditional art. Due to the radical renewals, happening in education sphere of the Republic of Kazakhstan – national education, wide experience and rich heritage of national handicraft, which were formed for centuries and were checked by time, put in a basis of education of a younger generation. It is clear, that the correct outlooks on life and the advanced thoughts can be formed only at the studying of bases of national culture and traditions, mastering of universal cultural heritage. Even if in the process of studying of the subject Art creativity, qualification is improved, abilities and skills of the making of applied art products are formed,

and we should not lose sight of the questions on the development of their aesthetic and art taste. It must be kept in mind that in the school program for discipline Art creativity the handicrafts of national applied art do not take the leading place. Due attention is not paid to the questions of influence on the development of aesthetic consciousness Through an acquaintance of the schoolchildren with works of national art, the ability to estimate the quality of these works and handicrafts. We think that such an approach will create the conditions for formation and development of the following features:

- A) Formation of aesthetic consciousness of teenagers, abilities to see, consider, analyze, develop the speech standards, tastes, aesthetic and sensual experience;
- b) Mastering by schoolchildren of terms and new concepts, the formation of their aesthetic consciousness, understanding of the figurative value of national handicraft that expands possibilities of obtaining full data about national art;
- C) Helps to pass the own idea about national art in a language that is understandable to all;
- D) In the process of aesthetic education, the formation of aesthetic consciousness of younger generation through national art there is studying of the spiritual experience, a national cultural heritage that contributes to the formation at schoolchildren of the feeling of love to their nation.

### 2. METHODOLOGY

### 2.1. Research methods

We apply several research methods to obtain the objective of the

research such as: The theoretical analysis of scientific and methodical and special literature on this problem, conversation, the analysis of programs for art creativity, school and methodical documentation on technological education and decorative-applied arts, studying and synthesis of pedagogical experience on aesthetic education of schoolchildren, the pedagogical experiment.

### 2.2. Experimental research base

Secondary school No. 59 of Shymkent city.

### 2.3. Stages of the research

The research of a problem was carried out in three steps: at the first stage there was carried out the theoretical analysis of the existing methodological approaches in philosophical, psychological and pedagogical scientific literature, dissertation works on the problem and also the theory and methods of pedagogical researches; the problem, the purpose and methods of the research determined, the plan of experimental research drew up; at the second stage the model of formation of aesthetic consciousness at schoolchildren of 5-9 classes by method of projects on the technology lessons was developed; the methods of formation of aesthetic consciousness at schoolchildren of 5-9 classes was developed; it was carried out the experimental work; at the third stage the experimental work was completed, theoretical and practical conclusions were specified, the received results were generalized and systematized.

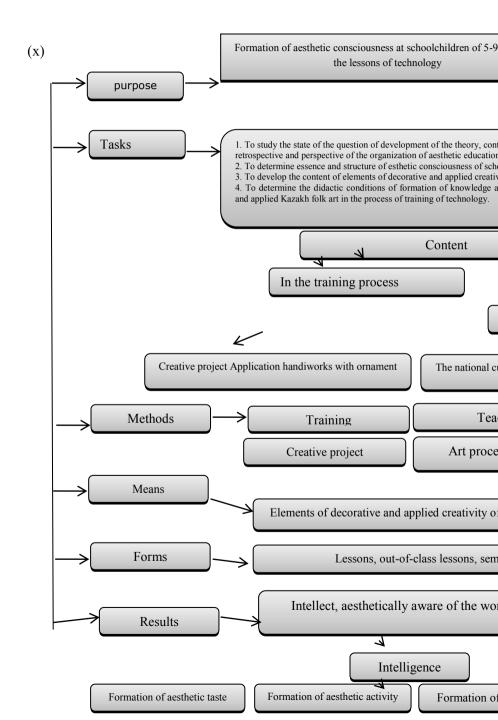
### 3. RESULTS

Understanding as aesthetic education the development of ability to perceive, to understand, to appreciate and create the beautiful in life and art, to participate actively in creativity, creation according to the laws of beauty, we consider formation of aesthetic consciousness as stage-by-stage purposeful impact on the identity of schoolchildren by means of folk decorative art and traditions, thanks to which at schoolchildren there are formed the aesthetic knowledge, ability to perceive, understand and appreciate the beautiful. We have created the theoretical model of the formation of aesthetic consciousness at schoolchildren for the realization of logic and the ideas of the research (figure 1). Basic elements for the formation of aesthetic consciousness are the national culture, art and handicraft of the Kazakh people.

The aesthetic consciousness of schoolchildren of 5-9 classes, formed in the process of making of application handiworks with the ornament during work with the project, is connected directly with their practice and level of skill. The project works contribute to independent creativity of the pupil during work with the project, create the artistic environment for self-expression and influence aesthetic consciousness, development of aesthetic taste, ability to analyze beauty, to estimate and project the own work. In connection with the solution of this problem, according to the purpose and problems of our research, the experimental works carried out. Schoolchildren of school No. 59 of Shymkent city took part in the experiment (in the control group - 240 people, in the experimental group - 240 people). During the stating experiment, the questioning was carried out among 480 schoolchildren

### of 5-9 classes. The questions for questioning:

- 1. What is the name of the pattern, consisting of rhythmically ordered elements?
  - 2. What application handiworks with an ornament do you know?
- 3. How you think, what place is taken by application handiworks with an ornament at making of syrmak, tuskiiz, khurdzhun, etc.?
  - 4. What sense do the people put in the ornament?
- 5. How did the people express the outlook on the natural phenomenon and forces?
- 6. Whether do you know the types of ornament, connected with space?
- 7. What types of the ornament of animal origin are used more often?
  - 8. What architectural constructions are decorated with patterns?
  - 9. What sense is concluded in a flag of our state?
- 10. What ornament is represented on the coat of arms of the Republic of Kazakhstan, what sense is expressed in it?
- 11. How do you think, is the applied art had at all people in the world, is it the spiritual wealth of the people?



Assessment: the personality with expanded activity of aesthe

Figure 1. Theoretical model of formation of esthetic consciousness a

- 12. How were the thoughts transferred from our ancestors?
- 13. Why was Bayterek constructed in Astana city? What does it express?
- 14. How do you think, whether is the Kazakh national ornament a spiritual treasure of the Kazakh people?
- 15. How do you think, whether has to be transferred the national heritage from ancestors to children?

Most of the schoolchildren could not give the correct answers on these questions or found it difficult to express their thoughts in words. Some schoolchildren heard about application handiworks, but did not know exact definition, and at that moment could not list their types. Analyzing results of questioning, we believe that the low level of knowledge of schoolchildren about applications, about their types, about ways of making in the following: First, teachers did not pay enough attention to an explanation in creative projects about the application handiworks with the ornament, having clear contents and wide use in everyday life. Secondly, it shows backwardness of aesthetic taste if the pupil does not feel the beauty of application handiworks with an ornament, he does not interest and does not admire them. Thirdly, teachers of the technology subject did not attach significance to creative works; there is a lack of methodical and visual aids for teachers and schoolchildren in this area; the wrong carrying out preparation for training at making of application handiworks with the ornament; the insufficient organization of special courses and

seminars for the teachers of subject. Together with it, there were determined the criteria and levels of formation of aesthetic consciousness at schoolchildren on the basis of the research of making of application handiworks with the ornament. Indicators of formation of aesthetic consciousness at schoolchildren are presented in table 1.

Table 1. Indicators of formation of aesthetic consciousness at schoolchildren

	Indicators of formation	on of aesthetic tastes at sci	hoolchildren
	Low level	Average level	High level
	Low interest in	Average interest in	The pupil has complete
	making of	making of application	idea about value and
	application	handiworks with the	importance of application
	handiworks with	ornament, the level of	handiworks with the
	the ornament;	aesthetic taste is low,	ornament, shows interest
	inconstancy of	despite aspiration for	in performance of the
	interest in	making of application	creative works,
	knowledge of	handiworks with the	demanding talent and
ınt	making of	ornament, the pupil is	sharpness; aspirations are
pone	application	not capable of	high, he perceives heard
com	handiworks with	conscious	and seen consciously at
nal	the ornament;	development,	the high level.
vatic	undeveloped	thoughtfulness and	
Motivational component	aesthetic taste.	ingenuity.	

	Due to the	The pupil has the	The formed aesthetic taste			
	undeveloped	aesthetic taste, but at	is shown at making of			
	aesthetic taste the	making of application	application handiworks			
	pupil cannot show	handiworks with the	with the ornament, the			
	skill at making of	ornament he cannot	pupil has sufficient			
	application	use more fully natural	knowledge in the field of			
	handiworks with	images in ornaments.	art works; he has a full			
	the ornament, he		opportunity to use natural			
	does not know		images in creation of			
t t	rather well		ornaments at making of			
onen	different types of		application handiworks.			
duic	application					
ıal co	handiworks with					
atior	the ornament.					
Educational component						

The results of schoolchildren at lessons of art creativity after the stating experiment are shown in table 2.

Table 2. Results of schoolchildren after the stating experiment

Exper	Low level		Average	level	High level		
iment	EG	CG	EG	CG	EG	CG	

levels	N		N		N		N					
	u		u		u		u					
	m		m		m		m		Nu		Nu	
	be		be		be		be		mb		mb	
	r		r		r		r		er		er	
	of		of		of		of		of		of	
	sc	%	sc	%	sc	%	sc	%	sch	%	sch	%
	ho		ho		ho		ho		ool		ool	
	ol		ol		ol		ol		chi		chil	
	ch		ch		ch		ch		ldr		dre	
	ild		il		ild		ild		en		n	
	re		dr		re		re					
	n		en		n		n					
The												
statin		3		4	13	5	12	51		5.		8,
g	96	9.	96	0	2	5	4	.7	12	3. 1	20	3
experi		9		0		3	7	. /		1		3
ment												

We used the following methods for increase in creative activity of schoolchildren of 5-9 classes: presentation, explanation, question-answer, action, problem, heuristic; and the works, performed on the program of the school course Project: exhibition, museum, excursion, art school, acquaintance with the handicrafts of applied art, competitions, games etc. Schoolchildren at such lessons, getting acquainted with different types of application handiworks with the ornament, using the gained knowledge, abilities and skills of work, come to new results. The main objective was achieved by work in

three directions at carrying out of the creative projects on the theme Application handiworks with an ornament in 5-9 classes of the school, developed for the formation of aesthetic consciousness of schoolchildren at the making of application handiworks with the ornament:

- a) To teach schoolchildren to appreciate national decorative art;
- b) To teach to project handiworks and to teach handicraft;
- c) Out-of-class work (Stavrova, 2018).

The possibility of formation of aesthetic consciousness through projects on the theme Application handiworks with an ornament in 5-9 classes of school is completely proved in practice. It is offered for each pupil to do one creative project within the academic year for the development of creative abilities at schoolchildren in the process of training course Art creativity. In general, there have to be done 5 creative projects under Art creativity course, where at the work performing, age features of schoolchildren are considered. According to the theoretical model of the formation of aesthetic consciousness at schoolchildren, we developed the program of the creative project Application handiworks with an ornament in 5-9 classes of school on the basis of which the curriculum was made (table 3).

Table 3. The training program of the creative project Application handiworks with an ornament in 5-9 classes

0.	Name of projects	Classes	Number of
			1
1.	Making of a purse with applications from the	5	6
2.	Making of a tuskiiz with applications from the	6	6
3.	Makin of a khurdzhun with applications from	7	6
4.	Technique of handling of appliques from the	8	5

5.	Technique of handling of appliques from the 9	5	
----	---	---	--

The lessons were conducted for the best development of projects on the themes, offered in the curriculum. We trained schoolchildren, during work with the creative project, to create a composition of projects, to cut out ornaments, to do the applications, to embroider. The schoolchildren develop the logic at the making of application handiworks from the ornament which helps with the choice of ornament composition. According to the results of questioning after the forming experiment at schoolchildren, aesthetic consciousness was developed, the taste was determined, the quality of knowledge was increased. Table 4 is presented the results of schoolchildren at lessons of art creativity after the forming experiment (in %) (Kunia & Othman, 2019).

Table 4. Results of schoolchildren after the forming experiment

Experi	Low	level			Average level				High level			
ment	EG		CG		EG	EG		EG			EG	
levels	Nu		Nu		Nu		Nu				Nu	
	mb		mb		mb		mb		Nu		mb	
	er		er		er		er		mbe		er	
	of		of		of		of		r of		of	
	sch	%	sch	%	sch	%	sch	%	scho	%	sch	%
	ool		ool		ool		ool		olch		ool	
	chi		chi		chi		chi		ildre		chi	
	ldr		ldr		ldr		ldr		n		ldr	
	en		en		en		en				en	
The		14		38.	15	64		52.		20.		
	35	.5	92	3	5	.8	26	5	50	7	22	9.2
formin										,		

g						
experi						
ment						

### 4. DISCUSSION

Questions of the theory and practice of aesthetic education are rather developed by foreign experts. Questions of aesthetic education were researched by Ardashirova (1999), Apraksina (1990), Burov (1999) and also by many other famous teachers. They noted that aesthetic education begins with the creation of a necessary reserve of elementary knowledge and impressions and it is the process which is made under the influence of the vital relations and influences, having aesthetic properties. The aesthetic ideal is formed in the process of aesthetic education, it is developed the ability to the creation of aesthetic values not only in art, but also in everyday life. The process of formation of aesthetic consciousness as the most correlated to spiritual, cultural, art and creative development of each subject, determines the extent of development of his aesthetic consciousness that gives the chance for the satisfaction of the needs in creativity and self-expression of schoolchildren in the educational process.

One of the main means of aesthetic education of the younger generation on a national and patriotic basis is national art. The educational possibilities of national handicraft are considered in works of the researchers Argynbayev (1987), Zhanibekov (2002), Kasimanov (1995), Margulan (1999), etc. The studying of theoretical, methodical, practical questions of fine and applied art at comprehensive schools of Kazakhstan are considered in works of Almukhanbetov (2000),

Asylkhanov (1998), Eralin (1992), Zholdasbekova (1993), Kamakov (2003), Satkanov (2003), etc. These works are paid the special attention to methods of training in the applied, decorative and fine arts, national and aesthetic education of schoolchildren which cornerstone is the national pedagogics. It is also possible to note the research works of Abdigapparova (1998), Akbayeva (2001), Zhiyentayeva (2004) which are devoted to aesthetic education of schoolchildren and students through national applied art.

According to these scientific and pedagogical works there are considered especially important subjects concerning familiarizing of schoolchildren of comprehensive schools and students of higher education institutions with national applied art, and on this basis - expansion of their outlook, practical abilities and education of aesthetic taste Altynsarin (1969), etc. paid the main attention to development of thinking and identity of schoolchildren in questions of the research of aesthetic education through national handicraft, development at schoolchildren of ability to think, dream, the formation of informative abilities

As these works are very rich valuable material, they can be used as the educational and methodical manual for carrying out teaching and educational works, renewal and improvement of training methods at comprehensive schools of Kazakhstan. However, the scientific and methodical analysis of works of the scientists on the research problem shown that questions of formation of aesthetic consciousness at lessons of art creativity did not find the comprehensive solution for the present moment. The current state of the system of technical education in the context of the formation of aesthetic consciousness at schoolchildren in these conditions conflicts between the need of society for aesthetic

knowledge in this area and insufficient readiness of schoolchildren for this process due to the lack of necessary methodical and didactic base for emergence of development of aesthetic senses. This led us to the necessity of searching the technology of formation of aesthetic consciousness at schoolchildren of 5-9 classes by the method of projects at the lessons Art creativity.

The methods of formation of aesthetic knowledge and abilities assume close interrelation with studying of the bases of aesthetic education in the process of labor training, by use of various forms, methods and ways, including, the methods of the project, contributing to systematization and synthesis of the received data. The experimental verification of the developed methods shown that process of formation of aesthetic consciousness proceeds more successfully if it is provided the complex formation of aesthetic knowledge and abilities not only visually – by illustrative methods, but also problem and search methods, and if there is applied the system of educational and informative tasks, focused on development of creative thinking and activation of cognitive activity at schoolchildren.

### 5. CONCLUSION

It is established that the formation of aesthetic consciousness at schoolchildren of 5-9 classes will successfully take place if children are taught the method of creative projects at lessons of art creativity. As a result of the conducted research on the problem of formation of aesthetic consciousness at the lessons Art creativity in 5-9 classes of comprehensive schools of Kazakhstan the next objectives were solved:

- 1. Theoretical bases of selection of content for Art creativity course on the aesthetic direction on the basis of national traditions are developed and determined:
- The aesthetic heritage of the Kazakh people as the most important component of modern production was analyzed; there was determined the character of aesthetic work as creative and project activity for the creation of a harmonious techno-world and subject and spatial environment in general;
- Psychological and pedagogical opportunities of formation of aesthetic consciousness and also didactic conditions of training in bases of knowledge and abilities for aesthetic education are revealed;
- The concepts methods of the creative project, the project activity, constructive projecting, and project task are justified and determined.
- 2. It is determined optimum available content of knowledge and abilities of modern design on the basis of formation of the purposes on the involvement of schoolchildren of 5-9 classes in activities for national handicraft and technology of making of application handiworks from the ornament, thereby it includes knowledge:
- Principles of functionality, ergonomics, technological effectiveness, aesthetics;
  - About the formation of composition and combinatorics;
  - Stages of art and constructive projecting;
  - About color and color combinations;
  - Physical and mechanical and aesthetic properties of materials;
  - Project methods of search: abilities;
- To analyze handiworks according to requirements of the modern design;

- To apply the principles of modern design at art and constructive projecting;
- To carry out the aesthetic analysis and synthesis at the solution of informative tasks;
- To carry out sketching and prototyping in the process of the solution of project tasks.
- 3. The program of the creative project Application handiworks with an ornament in 5-9 classes of school is developed on the basis of the selected content of education; the criteria for evaluation of experimental work, consisting of indicators of the level of formation on aesthetic knowledge and abilities are determined.
- 4. According to the research, the number of creative and project tasks was determined and their content was developed.

Developing national style in creative projects, schoolchildren have to be able to find necessary and suitable information for it, and for its independent development, they have to master various techniques and ways:

- To carry out purposeful work on broadening of their outlook;
- To carry out search work on a scientific basis in writing;
- To think creatively;
- Group and single search;
- Execution of the project or making of the handiworks according to modern requirements;
  - Use of theoretical knowledge in practice;
  - Critical relation to the work;
  - Determination of the price of goods;
  - sending to the auction.
  - 5. The system of creative and project tasks is developed in the

research. The basic principles of drawing up a system of such tasks are:

- Compliance of conditions of tasks to the nature of educational practical activities of schoolchildren;
- Interrelation of tasks with the content of art and project activity at schoolchildren;
- The connection of the project tasks with objects of technology and also with the handiworks, made by schoolchildren;
- Stage-By-Stage complication of conditions of the art and project tasks.

The following types of art and project tasks are determined as the main:

- Art and project analysis of handiworks;
- Planar formation and composition;
- Volumetric formation and composition;
- A solution of tasks by analogs (sample);
- A solution of tasks according to the condition (research, combination, transformation);
- The complex creative solution of tasks (projecting of handiworks on own plan).

It is possible to claim on the basis of results of the pedagogical research that the approach to formation of aesthetic consciousness, offered by us, is pedagogical and expedient, and the developed methods of formation of aesthetic knowledge and abilities at schoolchildren, based on handicraft and tradition of the Kazakh people in labor training, and it is rather effective, what static data processing of the forming experiment testifies to.

Thus, results of the research prove that the application of the

developed methods really leads to the successful formation of aesthetic consciousness at schoolchildren and the development of their aesthetic relation to the modern world.

Naturally, that our research cannot be exhaustive and it is considered as one of the possible versions of the solution of problems on the formation of aesthetic consciousness at schoolchildren. The received results can act as a theoretical basis for further scientific search and the solution of practical problems of aesthetic education:

- The application of the developed didactic model in other links of continuous education;
- The theoretical and practical research of educational opportunities of the secondary and higher vocational education information and development of aesthetic consciousness of the personality;
- Renewal of the content and system of competency development and retraining of educators on the problems of aesthetic education.

### REFERENCE

ABDIGAPPAROVA, U. 1998. Preparation of students for the use of Kazakh national ornamental art in the education of students. P. 23. Almaty. Kazakhstan.

AKBAYEVA, S. 2001. Formation of artistic taste of students on the basis of Kazakh traditional art. P. 156. Almaty. Kazakhstan.

ALMUKHANBETOV, B. 2000. Aesthetic education of pupils of 4-7 forms by means of national art. P. 17. Almaty. Kazakhstan.

ALTYNSARIN, Y. 1969. **Pedagogical ideas and educational activities**. P. 154. Almaty. Kazakhstan.

APRAKSINA, O. 1990. Essays on the history of artistic education in the Soviet school. P. 223. Moscow. Russia.

ARDASHIROVA, G. 1999. Formation of aesthetic taste in the culture of behavior of students in vocational schools. P. 26. Moscow. Russia.

ARGYNBAYEV, K. 1987. **Handicraft of the Kazakh people**. P. 128. Almaty. Russia.

ASYLKHANOV, E. 1998. Studying arts and crafts in secondary schools and pedagogical institutes of the republic. P. 20. Almaty. Kazakhstan.

BUROV, A. 1999. **Aesthetics: problems and disputes**. P. 116. Moscow. Russia.

ERALIN, K. 1992. Fine art of Kazakhstan in the system of artistic and professional training of future teachers of fine arts and artwork and pedagogical institutes. P. 36. Moscow. Kazakhstan.

KAMAKOV, A. 2003. Aesthetic education of students by means of arts and crafts. P. 16. Moscow. Russia.

KASIMANOV, S. **Handicraft of the Kazakh people**. P. 2013. Almaty. Kazakhstan.

KUNIA, S., & OTHMAN, S. 2019. **Investigative reporting pattern of tempo weekly news magazine.** Humanities & social sciences review. Vol. 6, No 1: 19-30. India.

MARGULAN, A. 1999. **Kazakh folk arts and crafts**. P. 256. Almaty. Kazakhstan.

SATKANOV, O. 2003. Perfection of education for work on the basis of national needlework in primary classes. P. 20. Almaty. Kazakhstan.

STAVROVA, E. 2018. **Balkans's Agriculture Value Chain. Current Point of View**. International Journal of Economics and Financial Research. Vol. 4, N° 8: 242-249. Pakistan.

ZHANIBEKOV, O. 2002. Culture of the Kazakh craft. P. 144. Almaty. Kazakhstan.

ZHIYENTAYEVA, B. 2004. National education of students at the lesson of technology in folk arts and crafts. P. 31. Karagandy. Kazakhstan

ZHOLDASBEKOVA, S. 1993. Formation of aesthetic interest of primary school students in decorative and applied art. P. 27. Almaty. Kazakhstan.



## opción

Revista de Ciencias Humanas y Sociales

Año 35, N° 88, (2019)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia. Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve