SOI: 1.1/TAS
DOI: 10.15863/TAS
Scopus ASJC: 1000

ISSN 2308-4944 (print)
ISSN 2409-0085 (online)

№ 12 (104) 2021

Teoretičeskaâ i prikladnaâ nauka

Theoretical & Applied Science

Philadelphia, USA

Teoretičeskaâ i prikladnaâ nauka

Theoretical & Applied Science

12 (104)

2021

International Scientific Journal

Theoretical & Applied Science

Founder: **International Academy of Theoretical & Applied Sciences**

Published since 2013 year. Issued Monthly.

International scientific journal «Theoretical & Applied Science», registered in France, and indexed more than 45 international scientific bases.

Editorial office: http://T-Science.org Phone: +777727-606-81

E-mail: T-Science@mail.ru

ISSN 2308-4944

12

9 772308 494218

International Scientific Journal

Theoretical & Applied Science

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International Scientific Journal

Theoretical & Applied Science

ISJ Theoretical & Applied Science, 12 (104), 1364.
Philadelphia, USA

Impact Factor ICV = 6.630

Impact Factor ISI = 0.829
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The percentage of rejected articles:

ISSN 2308-4944

Impact Factor:					
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	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 16.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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INVESTIGATION OF THE MECHANICAL PROPERTIES OF ABS-BASED 3D PRINTED SCAFFOLDS BY USING THE SOFTWARE SOLIDWORKS 2020

Abstract: *3D printing techniques are becoming state-of the art technique in the field of engineering research, enabling for the rapid and low-cost creation of prototypes and components using computer-aided design (CAD). In addition, interest to 3D printed scaffolds is also increasing in using these techniques in a clinical setting to create anatomically 3D printed models from medical imaging for research, training, and teaching. We discuss the benefits of common features of 3D printing and 3D printed scaffolds for patient education, healthcare professional education, interventional planning, and implant creation in this article. We also try to explain how to learn mechanical properties of 3D printed Acrylonitrile Butadiene Styrene (ABS)- based scaffolds during the printing and post printing and how to prepare them for 3D printing by using software Solidworks 2020. We preferred use ABS - based scaffold as example. We hope this knowledge will be of use to researchers, teachers and students with little or no previous experience in 3D printing scaffolds processing who have identified a potential application for 3D printing in a medical context, or those with a more general interest in the techniques.*

Key words: *3D bioprinting, 3D printed scaffolds, ABS based material, Scaffolds, printable biomaterials, biodegradable materials, mechanical properties, stress and strain, Young module.*

Language: *English*

Citation: Umarova, G. A., Juraev, D. D., Batirov, B. B., Rustamova, G. A., & Tursunboyev, M. A. (2021). Investigation of the mechanical properties of ABS-based 3d printed scaffolds by using the software solidworks 2020. *ISJ Theoretical & Applied Science, 12 (104),* 701-707.

Soi: http://s-o-i.org/1.1/TAS-12-104-72 *Doi*: https://dx.doi.org/10.15863/TAS.2021.12.104.72
Scopus ASCC: 1700.

Introduction

Currently there are shortage in bone implants three of the most important characteristics of living tissues: 1) the ability to self-regeneration; 2) the ability to maintain a blood supply; and 3) the ability to modify their structure and properties in response to environmental factors such as mechanical load. As we know the tissue engineering is a multi-disciplinary field that includes cell and molecular biology, materials science, chemical and mechanical engineering, chemistry and physics. In turn, mechanical and thermal feature of them is considered one of the most priority property. For instance mechanical load, stress and strength, bending coefficient, Young module, breaking point and liner extension coefficient from heat. To achieve the required functionality, the scaffolds must be; 1) biocompatible, maintain and facilitate cell functionality, and match the growth of cells and tissues; 2) have sufficient mechanical strength to support structural integrity. [1] This work were dedicated on the learning of mechanical and thermal properties of 3D printed scaffolds through software Solidworks's laboratory function, and also tried to give some general informations about types of potential scaffold materials, ABS – based materials.

1.1 Classes of potential scaffold materials.

When materials are implanted, they have a biological response from the body. Many are poisonous to the body, whereas others are biocompatible (not toxic). Biocompatible materials are divided into three categories: bioinert, resorbable, and bioactive.

ABS or Acrylonitrile butadiene styrene is a common thermoplastic polymer typically used for injection molding applications. This engineering plastic is popular due to its low production cost and the ease with which the material is machined by plastic manufacturers.

Bioinert materials

We can not say all material is completely inert on implantation, but the only response to the implantation of bioinert materials is encapsulation of the implant by fibrous tissue (scar tissue). Samples of bioinert materials are medical grade alumina, zirconia , stainless steels and high-density polyethylene that are used in the total hip replacements. We can not say all material is completely inert on implantation, but the only response to the implantation of bioinert materials is encapsulation of the implant by fibrous tissue (scar tissue). Samplas of bioinert materials are medical grade alumina, zirconia , stainless steels and high-density polyethylene that are used in the total hip replacements.

Resorbable materials

Resorbable materials are those that dissolve when they come into touch with body fluids and can then be secreted through the kidneys. Polymers that breakdown through chain scission, such as polyglycolic (PGA) and polylactic acids (PLLA), and their co-polymers, are the most prevalent biomedical resorbable materials, and are commonly used as sutures. There are some bioceramics that they are also resorbable in vivo, for instance calcium phosphates.

Bioactive materials

Bioactive materials cause the body to respond biologically, such as tissue bonding. This days known two classes of bioactive materials: osteoconductive and osteoproductive. Osteoconductive materials bond to hard tissue (bone) and stimulate bone growth along the surface of the bioactive material, e.g. synthetic hydroxyapatite and tri-calcium phosphate ceramics. Bioactive glasses, for example, which can connect to soft tissue such as gingival (gum) and cartilage, are osteoproductive materials that induce the formation of new bone on the material away from the bone/implant interface. The mechanism of bone bonding to bioactive materials is thought to be due to the formation of a hydroxyapatite layer (HA) on the surface of the materials after immersion in body fluid. This layer is similar to the apatite layer in bone and therefore a strong bond can form. The layer forms quickest on osteoproductive materials.

1.2 Polymer scaffolds

Degradable polymer materials are a famous choice of material for tissue-engineered 3D printed scaffolds for three reasons. Particularly, polymers are easy to process in the shape of a 3-D scaffold with a pore morphology suitable for tissue engineering fields. Secondly, polymers can have high tensile properties and high toughness and the mechanical properties of polymers can be controlled very easily by changing the molecular weight (chain length) of the polymer. Thirdly, bioresorbable polymers have been used successfully as dissolving sutures for many years. Therefore, these degradable polymers, such as the polyesters of poly(lactic acid) (PLA), poly(glycolic acid) (PGA) and poly(lactic acid-co-glycolic acid) (PLGA) are used for scaffold applications because they have passed FDA regulations, and scaffolds made from these materialscan provide a quick route to a commercial and clinical product. The methods used to produce porous networks in these polymers are fibre bonding or weaving, solvent casting, particulate salt leaching, phase separation, gas foaming, freeze drying and extrusion.

To create an open pore structure, the polymer solution can be foamed. Blowing agents, gas injection, supercritical fluid gassing, and freeze–drying can all be used to accomplish this.

The polymers that can be used for supercritical fluid gassing must have an high amorphous fraction. Polymer granules are plasticised due to the use of a gas, such as nitrogen or carbon dioxide, at high pressures. The dissolution of the gas into the polymer matrix results in a reduction of the viscosity, which allows the processing of the amorphous bioresorbable polyesters in a temperature range of 30–40 °C. However, on average, only 10–30% of the pores are interconnected.

2. Materials and methods (Experimental section)

2.1. Materials.

Drying treatment: Drying treatment before processing is necessary. The humidity should be less than 0.04%, and the recommended drying condition is 90~110℃, 2~4 hours. Melting temperature: 230~300 ℃. Mold temperature: 50~100℃. Injection pressure: depends on the plastic part. Injection speed: as high as possible.

ABS is widely used as a material for 3D printing, as it is a strong and cheap thermoplastic. For 3D Printing purposes, ABS is extruded into Filament so it can be fed through the 3D printer. When being used in a 3D printer, ABS is often melted in a 3D printer at temperatures close to 240°C (463°F), as it very quickly melts it. ABS is only used in FFF/FDM 3D printers, as resin 3D printers can not melt plastic.

2.2. Fabrication and design of the ABS scaffolds.

All 3D printed patterns and constructs were designed through Solidworks 2020 software. The information sets were at that point spared as stereolithography (STL) records and continued by utilizing Simplify 3D computer program to create a set of G-code for 3D printing. ABS filament through a heated extrusion head 175 µm diameter at 225 ◦C was preferred as filler for prototype. A close collection distance (0.5− 2 mm) enables the controllable deposition of melted ABS filament on a 110ºC collection surface affixed to the stage with X-Y-Z linear motion. Respective modulation of X, Y and Z motion generated various patterns of ABS filament in a layer-by-layer manner. Two ABS scaffolds were designed and printed Anycubic 3D Printer. For the porous cylinder scaffolds, the scaffolds were produced directly from the printer. After that, the compacted rolling scaffold was fixed into a temperature-tunable holder, which was preheated to about 65 ℃ to soften the printed filaments and enhance the adhesion between different layers.

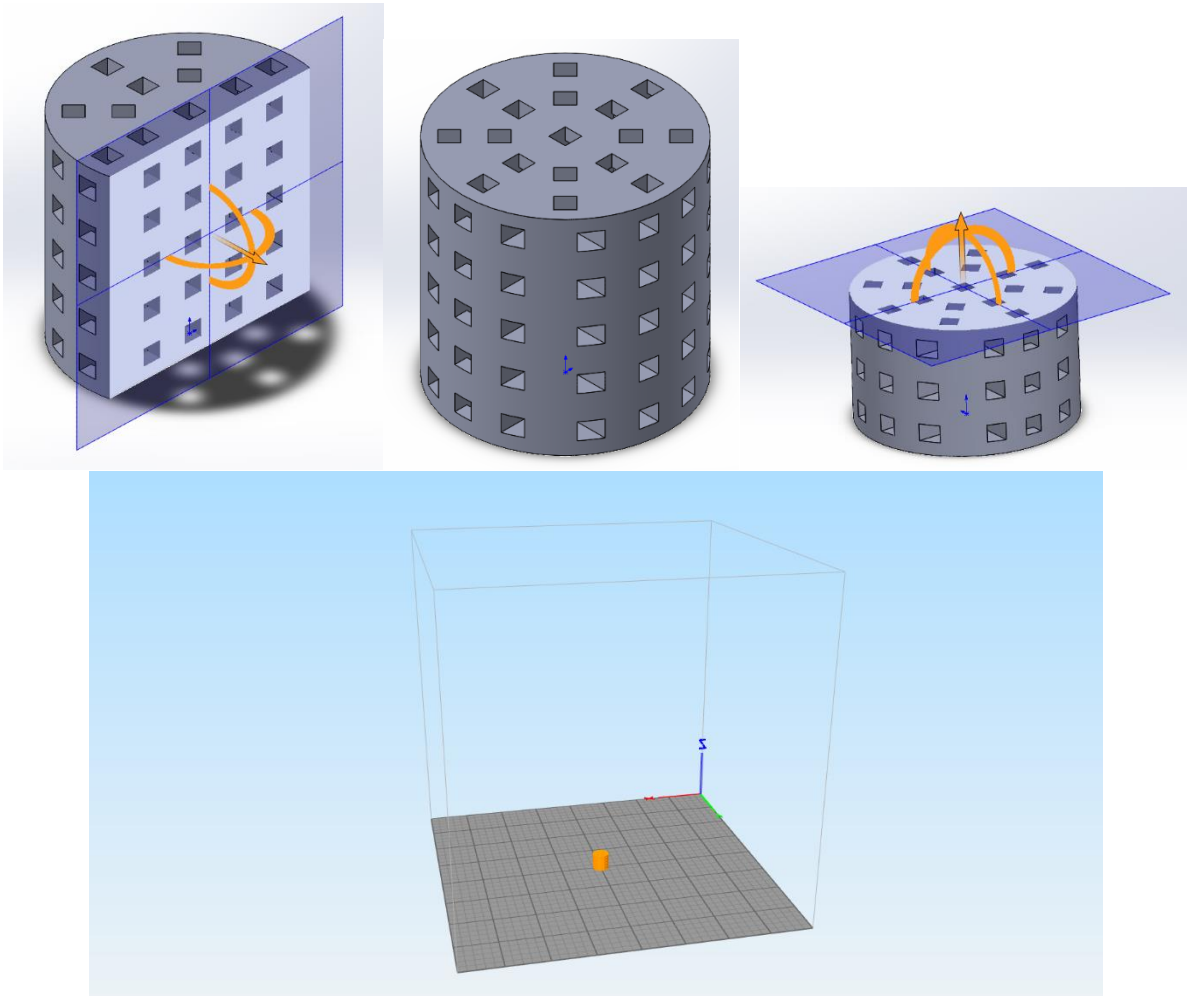

Fig.1. (a) cylinder scaffold (b) cross sectional view (c) longitudinal view (d) G- code converting process

2.3. ABS scaffold characterization.

Acrylonitrile butadiene styrene (**ABS**) (chemical formula $(C_8H_8)_x \cdot (C_4H_6)_y \cdot (C_3H_3N)_z$) is a common thermoplastic polymer. Its glass transition temperature is approximately 220 °F (104 °C). ABS is amorphous and therefore has no true melting point.

ABS is a terpolymer made by polymerizing styrene and acrylonitrile in the presence of polybutadiene. The proportions can vary from 15% to 35% acrylonitrile, 5% to 30% butadiene and 40% to 60% styrene. The result is a long chain of polybutadiene crisscrossed with shorter chains of poly(styrene-co-acrylonitrile). The nitrile groups from neighboring chains, being polar, attract each other and bind the chains together, making ABS stronger than pure polystyrene. The acrylonitrile also contributes chemical resistance, fatigue resistance, hardness, and rigidity, while increasing the heat deflection temperature. The styrene gives the plastic a shiny, impervious surface, as well as hardness, rigidity, and improved processing ease. The polybutadiene, a rubbery substance, provides toughness and ductility at low temperatures, at the cost of heat resistance and rigidity.[3] For the majority of applications, ABS can be used between −20 and 80 °C (−4 and 176 °F), as its mechanical properties vary with temperature.[5] The properties are created by rubber toughening, where fine particles of elastomer are distributed throughout the rigid matrix.

2.3.2.Porosity measurment

The porosity of the scaffolds (n = 3) was measured by using the Archimedes' principle in D.I. H_2O. The porosity was calculated according to the following equation: $\text{Porosity}=(W_{sat}-W_{dry})/(W_{sat}-W_{sus})\times 100\%$ Where W_{sat} stands for the weight of scaffold saturated with water, W_{dry} is the dry weight of the scaffold, and W_{sus} represents the weight of the scaffold suspended in water.

2.4. Mechanical testing

The mechanical properties of ABS-based 3D printed scaffolds were simulated by using Solidworks 2020 software. The stress-strain data were converted from the load-displacement data and the compressive modulus was found out from the slope of the stress-strain curve.

3. Results and discussion

3.2. Mechanical properties of the 3D ABS scaffolds

The mechanical properties of 3D structures are an important feature when considering the final application of the scaffolds. As shown in Fig. 2, the compressive stress of porous cylinder scaffolds were found to be 4.47 $*10^8$ N/m^2 , $4.02*10^8$ N/m^2 respectively. More specifically, the cylinder scaffold had the maximum compressive stress increased by 29.61 % and 61.23 % when compared with porous cylinder. The highest compressive stress of the cylinder scaffold was due to its solid structure. When the load was applied parallel to the stacking direction, layers were strongly connected to each other to increase the mechanical strength. In contrast, the porosity in the scaffolds causes a reduction in mechanical properties because it impairs the structural integrity of the scaffold, which as a result will not be suitable for load bearing . Generally, the higher the percentage of porosity, the lower the mechanical strength will be. In addition, the displacement modulus was calculated from the slope of the linear portion of the Stress-Strain curve. Fig. 3 exhibits the data corresponding to the Young's modulus for the, porous cylinder. Like the compressive stress, cylinder scaffold shows the largest Young's modulus of 0.35 ± 0.04 GPa, while porous spiral with the highest porosity shows the smallest Young's modulus of 0.19 ± 0.02 GPa. In this figure datas were given by descending order . Although porous cylinder scaffold present lower compressive stress and Young's modulus, it is still appropriate for the bone regeneration. This is because the typical compressive stress of cancellous bone ranges from 0.5–85 MPa and its Young's modulus is in the range of 0.01 to 0.2 Gpa.

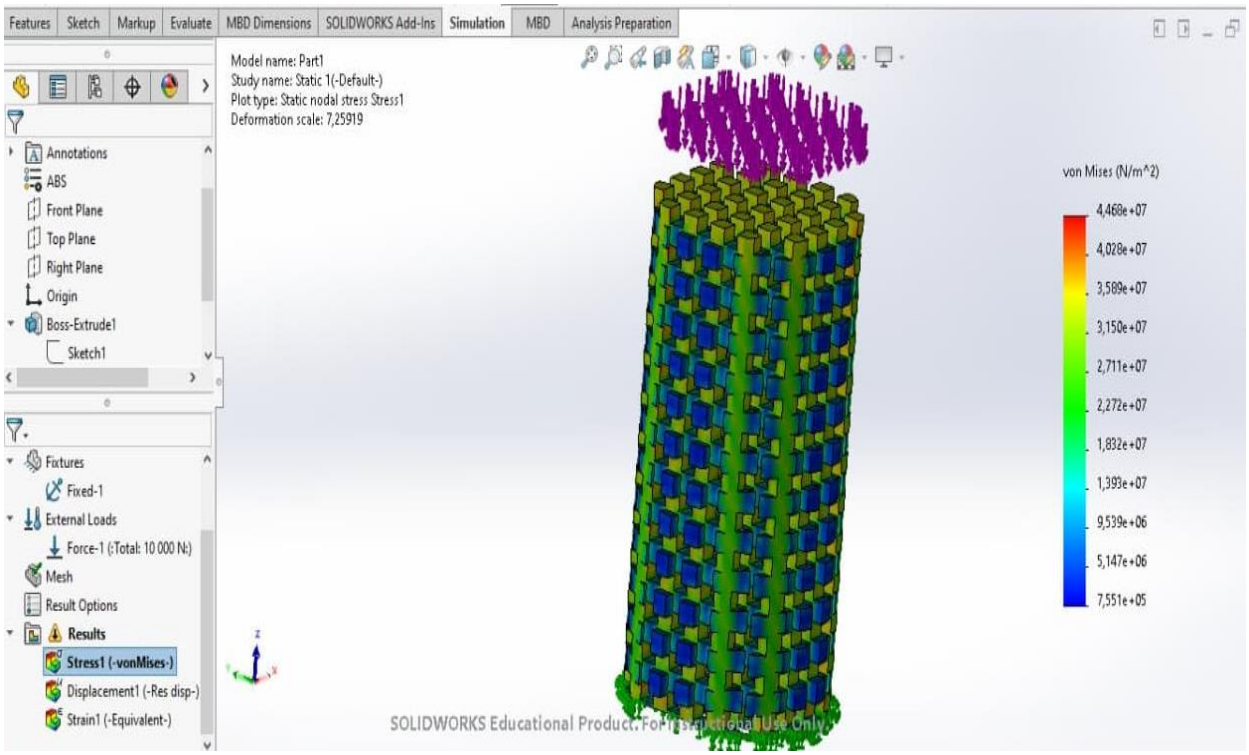

Fig. 2. compressive stress

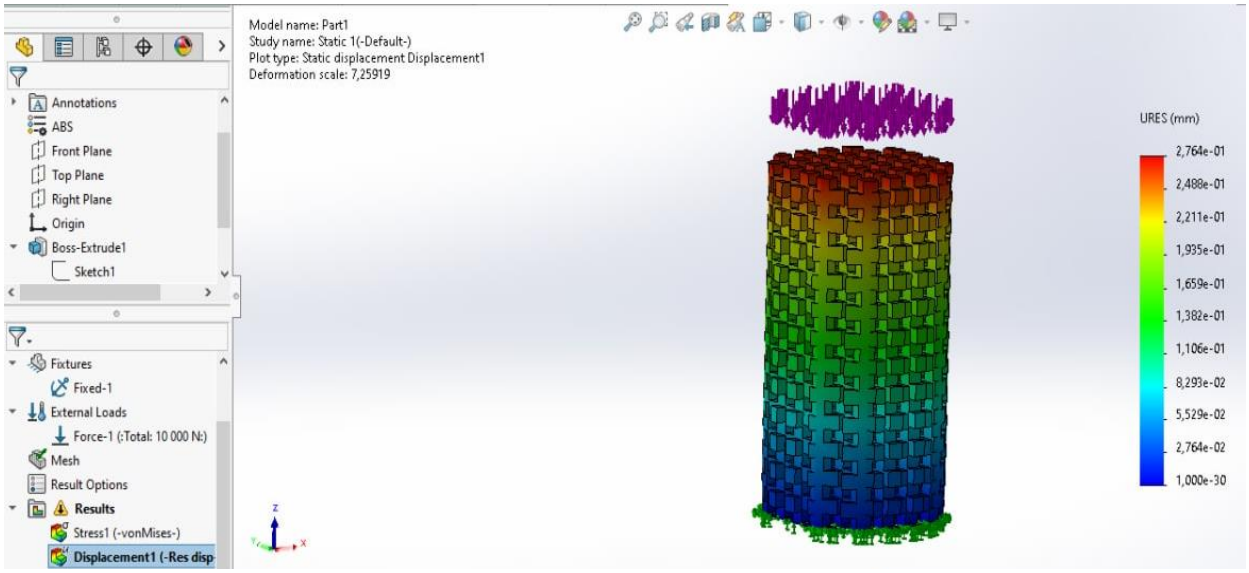

Fig. 3. Displacement

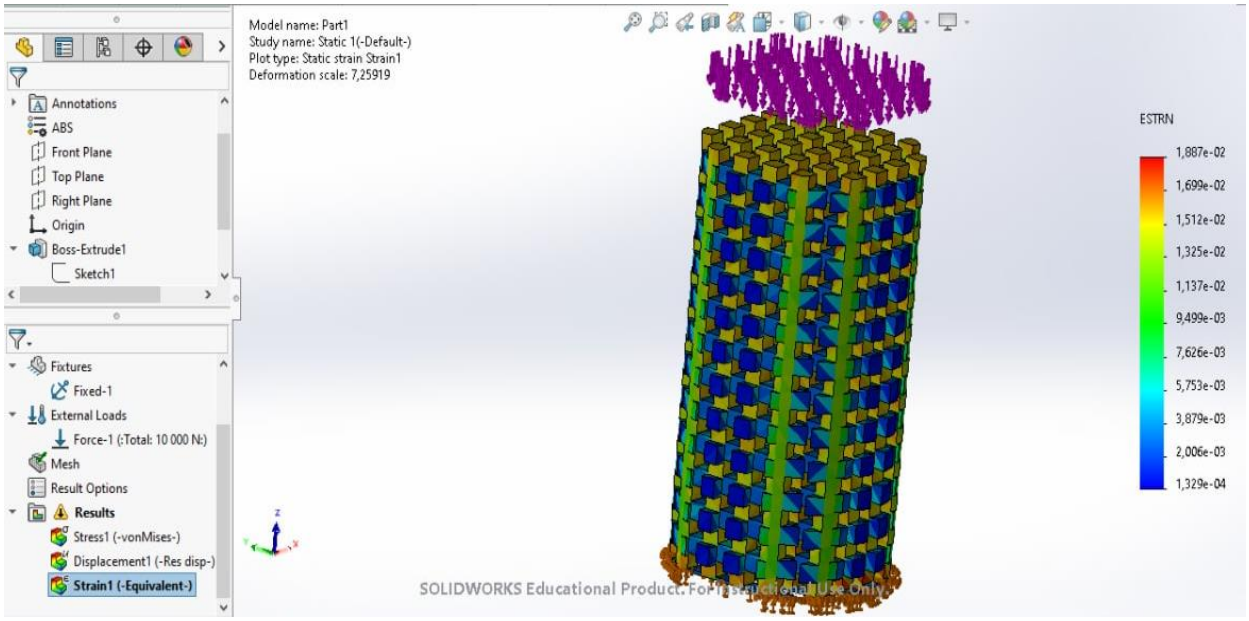

Fig. 4. Strain

4. Conclusion.

In this article , we tried to learn mechanical properties of ABS -based scaffolds and design and fabricate the ABS porous cylinder scaffold (as a model) by using the 3D printing method and Solidworks 2020 software. A porous cylinder scaffolds have an average pore size approximately of 928 nm and all pores were interconnected. The pores were large enough to improve cell implantation, new blood vessel infiltration, and high oxygenation. The porous cylinder scaffold with low porosity (around 30 %) could be fabricated directly from the printer. However, in order to prepare highporosity scaffold, we worked on combined the traditional bio-fabrication method with the novel 3D printing, because the current 3D printing method cannot obtain a high-quality and well-structured scaffold with high porosity. The literature review showed that, the compressive properties of porous scaffolds were found to be appropriate within the range of human cancellous bone.

We tried to identify the young modulus, stress and strain, displacement of ABS porous cylinder scaffold (as a model) under the mechanical loading . All data and results were analyzed. At the next part of the research we are going to work on thermal and mechanical properties of PLA based scaffolds.

Acknowledgements

We would like to express our deep gratitude to Professor İdris Kabalci and Professor Ziyodulla Yusupov, for their patient guidance, enthusiastic encouragement of this work. Our grateful thanks are also extended to Mr. Tafuuq Abdullah, who is master student of the department of Biomedical engineering of Karabuk university, Avzalbek Iminov who is staff of Yoshlar Texnoparki in Andijan, Uzbekistan for them help in finding materials, referances and doing the data analysis.

Conflicts and interest

If you will face to any conflicts during the read this work you should know they are only my mistakes which come from my inexperience. I will be happy if you share about your interests on the topic by this contact, dilmurod.juraev.92@gmail.com

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 16.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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PRODUCTIVITY OF MONOSEMANTIC VERBS OF ENGLISH AND RUSSIAN LANGUAGES

Abstract: *The article deals with such a concept as the productivity of monosemantic verbs of modern Russian and English languages. Based on the historical material, the main principles of word formation productivity are identified, in the article there are examples of the most productive derivatives of affixes, prefixes and suffixes of verbs , and the problem of comparative analysis of the monosemantic verbs of both languages is revealed.*

Key words: *productivity, derivational type, derivation, affix, prefix, suffixation, conversion, reduplication.*

Language: *Russian*

Citation: Karimbaeva, M. M. (2021). Productivity of monosemantic verbs of English and Russian languages. *ISJ Theoretical & Applied Science, 12 (104),* 708-712.

Soi: http://s-o-i.org/1.1/TAS-12-104-73 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.73

Scopus ASCC: *1203.*

ПРОДУКТИВНОСТЬ МОНОСЕМАНТИЧЕСКИХ ГЛАГОЛОВ АНГЛИЙСКОГО И РУССКОГО ЯЗЫКОВ

Аннотация: *В статье рассматривается такое понятие как продуктивность моносемантических глаголов современного русского и английского языков. Выявляются основные принципы продуктивности словообразования, основываясь на историческом материале, приводятся примеры самых продуктивных производных аффиксов, префиксов и суффиксов глаголов и раскрывается проблема сопоставительного анализа моносемантических глаголов обоих языков.*

Ключевые слова: *продуктивность, словообразовательный тип, словообразование, аффикс, префикс, суффиксация, конверсия, редупликация.*

Введение

Одной из главных характеристик самых различных языковых единиц является продуктивность.

Само понятие продуктивности в лингвистике является дискуссионным. Объяснения данного понятия можно найти в трудах М. Докулила, Г.О. Винокура, А.А. Реформатского, Н.М. Шанского, А.Н. Тихонова, Е.А. Земской, И.С. Улуханова, В.В. Лопатина и др. Многие из этих ученых считают, что главным принципом продуктивности словообразования считается его активность, т. е. возможность служить образцом для образования новых слов. Но применение данного критерия при выявлении продуктивности словообразовательного типа на историческом материале вызывает затруднения вследствие экстралингвистических обстоятельств, в связи с тем, что далеко не все исторические памятники письменности русского и английского языков дошли до нас и далеко не вся лексика сохранившихся исторических источников нашла отражение в существующих исторических словарях.[1]

Глагол отличается сложностью своего содержания, богатством парадигматических и

[1] Магомедова Н.Р. Словообразование в рутульском и английском языках. – Автореф. дис. к.ф.н. – Махачкала, 2009. – С. 10

синтагматических связей, имеет гибкую семантическую структуру. «Глагол, - писал В.В.Виноградов, - самая сложная и самая ёмкая грамматическая категория русского языка. Глагол наиболее конструктивен по сравнению со всеми другими категориями частей речи».[2]

При установлении продуктивности словообразования глаголов на историческом материале можно было бы основываться на его словообразовательной регулярности, под которой имеется в виду повторяемость формально-семантических отношений производного и производящего. То есть под продуктивностью словообразовательного типа имеется в виду общее количество производных слов со значением лица, относящихся к данному словообразовательному типу. В то же время количественный критерий не всегда служит показателем словообразовательной активности словообразовательного типа.

Словарный состав любого языка – лексика, это совокупность слов, входящих в состав какого-либо языка или диалекта. Словарный состав меняется постоянно, в нём отображается беспрерывное развитие общества, культуры и научно-технического прогресса.

Пополнение новыми словами и выход архаизмов из активного употребления – это те два процесса, которые постоянно происходят в развитии словарного состава языка.

Словообразование занимает важное место в структурной системе языка, с ним связано изучение всех аспектов создания, функционирования, строения и классификации слов. Полноценное функционирование языка, процесс номинации всех реалий, которые появляются с развитием человеческого общества, невозможен без такого феномена, как словообразование.

В английском языке примером самых продуктивных производных слов можно считать модели с суффиксами: v + er (teacher), n + able (readable), n + less (colourless), n + like (catlike), n (adj) + ize (ideologize); с префиксами: un + adj (unemployable); модели сложных слов: n + n (foodscience); n + adj (dustfree); и модели сложнопроизводных слов: n + v + er (price-raiser), adj (n) + n + ed (loud-voiced).

Модели производных с суффиксами: n + en (woolen), n + ous (dangerous); с префиксами: be + v (becloud) и модели сложных слов v + v (make-believe), v + adv (speak-easy) и др. могут являться примером малопродуктивных[3].

В современном английском языке имеются аффиксы продуктивные, малопродуктивные и непродуктивные.

Учитывая тот факт, что продуктивных аффиксов в современном английском языке не очень много и, тем не менее, образование новых слов путем аффиксации может занимать видное место среди многих продуктивных способов пополнения словарного состава современного английского языка.

Префикс mis- (да., др-исл., др-сакс, др-фризск. mis-; miss-; двн. missa-, missi-, misse-) в древнеанглийском был чисто глагольным префиксом и имел отрицательное и пренебрежительное значение и в то же время мог придавать глаголу оценочное значение «неправильно».

Значительную продуктивность и широкую сочетаемость во все эпохи развития английского языка проявляет и префикс un-.

В различных частях речи его значение было неодинаково. В глаголах он показывал аннулирование действия, выраженного в производящей основе. Так, от древнеанглийского дошли глаголы to unfold (unfeoldan «развертывать»), to unbind (unbindan «развязывать»); от среднеанглийского -to unbutton, to unbuckle, tounsheathe, to unpin, to unshoe.

Префикс under- показывал примерно похожую картину развития и активность в английском языке. И он также образовался из префиксального употребления предлога under (under «под»; гол. undar; др-исл. undir; др-нем . unter). От древнеанглийского языка до современного пришло несколько глаголов, образованных этим префиксом, причем в одних он раскрывает пространственное значение «под», например, to underlie (да. underliean «лежать под (чем-либо)», to underlay (да. underlecgan «подкладывать»), а в других значение его частично или полностью затемнено, ср. to understand (da. understondan, «понимать»), to undergo (да. undergan «подлежать», «подвергаться»). В среднеанглийском префикс under- выступает с вполне ощутимым пространственным значением «под» (например, глагол to undermine «подкапывать»; наречие underfoot «под ногами»), но и здесь происходило затемнение собственного значения префикса (например, to undertake «предпринимать», «браться за какое-либо дело»).

Префикс over- возник в древнеанглийском языке из префиксального употребления предлога ofer «над» и имел значение «над», из которого

[2] Виноградов В.В. Русский язык. Грамматическое учение о слове. М.: Высшая школа, 1972. –С. 54

[3] Омельченко Л.Ф. Особенности словообразовательных процессов разного типа. // Социолингвистика. Лексикология. Грамматика. – Пятигорск: ПГПИИЯ, 1993. – С. 179.

путем обобщения и абстракции развилось значение «пере-» (превосходства, преобладания).

От древнеанглийского дошли глаголы to oversee (да. oferseon «надзирать»), to overdrive (да. ofer-drlfan «одолеть», «побороть»). В среднеанглийском этот префикс имел те же значения (ср. to overgild, to overbear), а также значение «сверх меры» (например, to overabound, to overcharge, to overgrow).

Префикс up- (да. нареч. tip, uppe «наверх», «сверху»; др-нем. uf; др-исл. upp, ср. гол. iup) активно использовался уже и в древнеанглийском словообразовании, хотя от этого периода почти не осталось производных, им оформленных (ср. to upbraid, upland). Он был весьма продуктивен в области глагола и существительного в среднеанглийский период, но большая часть ныне существующих в языке слов восходит к XVI в. и позже, ср. глаголы touphold, to uplift (XIVB.), to upturn, to uproot; существительные uproar,upshot, upstart, upgrowth; наречия uphill, upstairs, upright (XVI—XVIIBB.).

В глагольном словообразовании английского языка особую группу составляют звукоподражательные и звукоизобразительные глаголы, образуемые по модели «идеофон + глагол»: pooh-pooh «высмеивать, отзываться с презрением».

Что касается словосложения, то в различных моделях оно занимает преобладающее положение в глагольном словообразовании английского языка. Повторения с чередованием i-a, i-o: dilly-dally «болтаться без дела» (разг.), tip-top «первоклассный» являются наиболее частыми.

Аффиксация, осново-сложение, полная и частичная редупликация являются основными способами глагольного словообразования.

В глагольном словообразовании аффиксация представлена следующими способами, и они обладают разной степенью продуктивности: префиксацией, инфиксацией суффиксацией.

В современном английском языке развитие префиксальной системы привело к изменению в функции префикса. Префикс используется также и для образования таких слов, в которых не только перестраивается лексическое значение. Во многих случаях префикс приобрел функцию образования новой лексемы, качественно отличающейся от исходного слова наряду с функцией видоизменения.

В английском языке продуктивными являются префиксы с отрицательным значением. Префиксы un-, dis-, de- придают глаголам значение противоположного действия. Префикс mis- придает значение глаголу «сделать что-нибудь не правильно, ошибочно»: to apply «применять» – to misapply «неправильно применять».

Глагольные префиксы post- «после», pre- «до, перед, раньше», re- «снова, вновь» в английском языке передают семантику времени: to write «писать» – to re-write «переписать» и т.д.

Следующим продуктивным способом глагольного словообразования в современном английском языке является суффиксация. Здесь от существительных и прилагательных глаголы образуются посредством следующих суффиксов: от непродуктивного суффикса -en (deep «глубокий» – to deepen «углубляться», fast «крепкий» – to fasten «укреплять»); от малопродуктивного суффикса -fy: (intense «сильный» – to intensify «усиливать», simple «простой» – simple «упрощать»); от непродуктивного суффикса -ize (crystal «кристалл» – to crystallize «кристаллизовать(ся)», real «настоящий» – to realize «осуществлять»).

Вторым по важности после аффиксации способом словообразования, особенно в сфере существительного и прилагательного является словосложение[4].

Что касается глагольного словообразования, то в древнеанглийском языке словосложение с наречием в качестве первого компонента было распространено в сфере глаголов, но в дальнейшем он не нашел продолжения, и уже в среднеанглийский период при создании сложных глаголов практически не употреблялся.

В современном английском языке группу слов, возникших по способу конверсии, составляют глаголы. Так, например, они могут быть образованы от любого существительного: an echo (n.) – to echo (v.); a can –to can; a nail – to nail. От прилагательных глаголы по конверсии образуются реже, чем от существительных, но, тем не менее, их в языке немало.

Конверсия в английском языке в парах «существительное – глагол» подтверждается тем фактом, что в системе образования глагола от существительного существуют всего лишь три суффикса, при этом все они имеют свои особенности и значения, которые не дают им возможности участвовать в образовании глаголов с общим (неспециальным) значением. Эти три суффикса (-ate, -ize, -ify) образуют отыменные глаголы с научным и техническим значением, при этом образуются пары с определенными семантическими отношениями производности: fictionize «выдумывать», terrorize «терроризировать», carburize «соединять с углем, насыщать углем».

[4] Арнольд И.В. Лексикология современного английского языка. М., 1986. – С. 304.

В сферу глагольного словообразования английского языка входит также и редупликация.

В английском языке редупликацию следует отнести к числу более редких типов морфологического словообразования. Удвоение здесь встречается, как правило, в звукоподражательных словах; оно эмоционально окрашено и ограничено стилистической сферой разговорной лексики.

Что касается русского языка, то мы можем сравнить такие формы 1-го лица ед. числа глагола: Я люблю, бегу, шучу, кричу, с одной стороны, и Я ем, Я дам, с другой. Окончание -у иногда изображается буквой -ю: читаю, читаю, дремлю. Это окончание — универсальный показатель значения «1-е лицо ед. числа». Его получит даже намеренно изобретенный, фантастический глагол в 1-м лице ед. числа: — Что ты там делаешь? — Барамбурю, обожамлю, ласкачу... Любой человек, знающий русский язык, поймет, что это формы глагола.

Совсем другое дело — окончание -м. Оно встречается лишь у двух глаголов и их производных. Новые глаголы не выражают значения 1-го лица ед. числа с помощью этого окончания. Если вы к этим же придуманным глаголам прибавите окончание -м, никто не поймет, что это формы 1-го лица: что такое — «Я барамбурюм», «Я ласкачум».

Скорее всего, слышащие или читающие это подумают, что это какие-то неслыханные существительные[5].

Те языковые модели, которые в языке определенной эпохи служат образцом для построения новых слов, форм, синтаксических конструкций и т.д., называются продуктивными.

Различие в продуктивности — непродуктивности характеризует не только глагольные окончания -у и -м. Оно охватывает весь язык и составляет очень важное свойство его единиц.

Продуктивные единицы нельзя сосчитать, они составляют открытый список, который всегда может быть продолжен. Непродуктивные явления можно задавать списком, перечислить, ибо новые единицы языка по непродуктивной модели не создаются.

Понятие продуктивности применяется ко всем уровням языка (фонетике, морфологии, синтаксису, лексике), но не ко всем его элементам. Оно может быть применено лишь к тем единицам, которые имеют какую-то формальную организацию, структуру. Иными словами это можно выразить так: продуктивностью обладают модели, конструкции языка, а не простые неразложимые элементы. Так, например, в фонетике имеются продуктивные сочетания звуков, в морфологии — продуктивные формы слов, т. е. сочетаний основ с окончаниями, в синтаксисе — продуктивные типы словосочетаний и предложений.

Важное значение понятие продуктивность имеет в словообразовании. Продуктивным или непродуктивным является словообразовательный тип.

Словообразовательный тип — это формула, модель, по которой происходит построение новых слов. К одному словообразовательному типу относятся слова, обладающие общностью трех элементов:

1) средств словообразования, 2) частей речи производящей основы, 3) словообразовательного значения.

Примеры продуктивных типов: существительные с суффиксом

-ость, имеющие значение отвлеченного признака: яркость, стойкость, радость; отглагольные существительные с суффиксом

-ка: разноска, прибавка; образуемые от прилагательных наречия с суффиксом -о: быстро, легко, мило. Слова, создаваемые по этим типам, нельзя пересчитать, так как их число постоянно пополняется.

Пример непродуктивных словообразовательных типов: отглагольные существительные со значением отвлеченного действия, образуемые суффиксом -ёж: делёж, грабёж — или -ба: косьба, молотьба.

Словообразовательные типы живут в языке сложной жизнью. Они могут обнаруживать продуктивность не во всех сферах языка, а лишь в некоторых.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
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	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 16.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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SOME ISSUES OF LEGALIZATION OF ILLEGAL INCOME AND FINANCING OF TERRORISM

Abstract: *The article reveals the specific features of laundering illegal money, identifies the problems that arise with money laundering, pays special attention to the stages of money laundering in the process of integrating funds into legal channels, analyzes in detail the current trends in the field of laundering illegal money, identifies the attractive sides of offshore jurisdictions and banks for financial transactions by terrorist organizations and criminal communities. The categories of offshore banks are defined. According to the results of the study, relevant proposals are given.*

Key words: *cryptocurrencies, digitalization of the economy, financing of terrorism, offshore banks, financial transactions, money laundering.*

Language: *Russian*

Citation: Alimova, G. A., & Anarkulov, A. D. (2021). Some issues of legalization of illegal income and financing of terrorism. *ISJ Theoretical & Applied Science, 12 (104)*, 713-719.

Soi: http://s-o-i.org/1.1/TAS-12-104-74 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.74

Scopus ASCC: *3300.*

НЕКОТОРЫЕ ВОПРОСЫ ЛЕГАЛИЗАЦИИ НЕЗАКОННЫХ ДОХОДОВ И ФИНАНСИРОВАНИЯ ТЕРРОРИЗМА

Аннотация: *В статье раскрыты специфические особенности отмывания нелегальных денег, определены проблемы, возникающие с отмыванием денег, отдельное внимание уделено этапам отмывания денег в процессе интеграции средств в легальные каналы,подробно проанализированы современные тенденции в области отмывания нелегальных денег, выявлены привлекательные стороны оффшорных юрисдикций и банков для проведения финансовых операций террористическими организациями и преступными сообществами. Определены категории оффшорных банков. По результатам исследования даны соответствующие предложения.*

Ключевые слова: *криптовалюты, цифровизация экономики, финансирование терроризма, оффшорные банки, финансовые операции, отмывание денег.*

Введение

Методы исследования. Исследование влияния оффшорных юрисдикций и банков на уровень преступности и финансирование терроризмаявляется базовым и может расцениваться как фундаментальный вопрос организации противодействующих мероприятий. Именно поэтому исследование данного вопроса

потребовало научного обоснования. В процессе исследования масштабов понятия «отмывание денег», «оффшорные банки» был применен публицистический метод, который позволил провести обзор научной литературы и выявить основные тенденции, эволюцию в подходах «отмывания денег»и новых специфических особенностей функционирования оффшорных банков и юрисдикций в условиях цифровизации экономики. Использование сравнительно-аналитического метода позволил оценить возможности оффшорных банков и их привлекательность для проведения противозаконных финансовых операций. Использование пространственно-сравнительного метода позволило рассмотреть вопрос в территориальном аспекте и выявить страны с наличием оффшорных юрисдикций и раскрыть специфику функционирования и использования экономических механизмов в них.

Полученные результаты. В процессе исследования влияния оффшорных юрисдикций и банков на уровень преступности и финансирование терроризма были получены следующие результаты:

1.Выявлены угрозы, возникающие в результате и в процессе отмывания денег:

- опасность денежных средств, которые нуждаются в незаконной легализации не только являются “преступными”, но и способствуют развитию теневой экономики;
- опасность концентрации большого количества денежных средств в преступных руках;
- опасность появления “мыльных пузарей”, которые могут стать сильнейшим фактором возникновения финансовых кризисов;
- опасность повышения уровня коррумпированности работников государственных органов управления;
- опасность использования “отмытых денег” для дистабилизации политической ситуации в стране, финансирование терроризма.

2.Определены этапы процесса отмывания денег.

При этом выявлено, что интеграция средств в легальные каналы включает в себя процесс фальсификации финансовых документов, проведение незаконных сделок с третьими лицами, приобретение дорогостоящих материальных благ, осуществление “оффшорной” деятельности, манипулирование ценами.

3.Определены современные тенденции в области отмывания денег.

Выявлено, что на сегодняшний день в странах с повышенной коррумпированностью государственных структур, нормативно-правовые документы имеют характер неоднозначности, допуская“разночтения”, которые открывают большие возможности для проведения преступных операций и махинаций.Развитие интернет- пространства в современном мире позволило различным преступным и террористических группам, сообществам осуществлять свою деятельность уже не только в рамках определённой страны, но и в региональном и в глобальном масштабе. В результате, нами определены основные угрозы в современном мире, связанные с отмыванием “грязных” денег и финансированием терроризма. К ним были отнесены:интернет-казино,онлайн – игры,интернет- аукционы, интернет-магазины,вебсайты, онлайн биржи,интернет-пожертвования. Выявлены опасные тенденции, связанные с возможностью быстрого перемещения незаконных активов из одной точки земного шара в другую с помощью счетов-активов. Также уделено внимание благотворительным и гуманитарным фондам,с помощью которых осуществляются преступные операции по отмыванию денег и финансированию терроризма. Выделена особая проблематика, связанная с деятельностью оффшорных юрисдикций и банков.

4. Выявлены причины повышенной привлекательности оффшорных юрисдикций и банков и разработана их классификация на: финансовую секретность, определён корень проблем – это возможность ухода от уплаты налогов и легализации незаконных средств; ввалютном контроле - это сепаратный подход к резидентам и нерезидентам в оффшорных юрисдикциях;определена наиболее повышенная привлекательность оффшорных банков.

*5.По результатам анализа выявлены следующие привлекательные для осуществления незаконных операций стороны:*способность объединять множество оффшорных банковских предприятий; действие в оффшорном режиме; обслуживание иностранных клиентов.

Анализ и обсуждение результатов.

Определение,данное Группой разработки финансовых мер борьбы с отмыванием денег (ФАТF) термину «отмывание денег», как обработку преступных доходов в целях сокрытия их происхождения с последующей легализацией. [6]

В чём опасность отмывания денег?

Во- первых, «грязные деньги» - это денежные средства, полученные от:

- незаконного оборота наркотиков;
- коррупционных действий и операций;
- краж;
- мошенничеств, налоговых, инвестиционных и т.д;
- торговли людьми;
- незаконной торговли оружием;
- и др.

Во- вторых, легализация преступных доходов позволяет преступникам или преступным сообществам накапливать и концентрировать большой объём денежных ресурсов.

В- третьих, отмывание денег представляет серьезную угрозу для экономики страны, угрожая целостности финансовых учреждений и мировой экономической системы , создавая неблагоприятные условия и барьеры на пути развития отраслей экономик.

В- четвёртых, отмывание денег подрывает доверие населения к некоторым профессиям и чиновникам. Так, к примеру, в странах с высокими показателями коррумпированности государственных служащих, низкий уровень доверия населения к представителям таких профессий как: юристы,бухгалтеры и нотариусы и др.

В- пятых, концентрация большого объёма денежных средств в преступных руках, зачастую способствует финансированию всевозможных цветных революций и других механизмов государственного переворота и терроризма, в том числе международных террористических организаций и движений.

Интеграция средств в легальные каналы – является конечным этапом отмывания денег (см. рис.1) и подразделяется на: [7]

-фальсификацию, утаивание источников дохода, собственности, активов, кредитов,ссуд;

- легализацию «грязных денег» посредствам проведения сделок с третьими лицами;

- легализацию «грязных денег» путём приобретения материальных благ (недвижимость, драгоценные изделия, яхты и другие блага ит.д.

-путём создания зарубежных либо оффшорных компаний с фальсифицированными иностранными юридическими лицами в качестве владельцев активов, сокрытие собственных активов;

- цена-манипулирование (над- и под-счета), а также манипулирование оборотом через совмещение незаконных и легальных источников дохода.

Рис.1 Этапы процесса отмывания денег.[7]

Определим современные тенденции в области отмывания денег и финансирования терроризма.

1. Использование бизнеса в деятельности, в которой задействованы наличные денежные средства, чтоявляется традиционным методом отмывания денег. Однако методы и пути отмывания денег находятся в постоянном совершенствовании и порой имеют изощрённый вид, а инновационность методов обхода норм законодательства с нахождением его слабых сторон и изъянов говорит о невероятной активности преступных элементов.[1]

2. Сегодня всё больше развивается торговля товаров и услуг через криптовалюты. Действительно, финансирование и проведение финансовых операций криптовалютой позволяет за короткое время производить транзакции при этом сохраняя их анонимность. Скорость и глобальная доступность криптовалют в сочетании с ограниченными правилами, дезагрегированием установленных финансовых посредников и возможностью скрыть истиннуюличность

владельцев делаютихпривлекательным методом для преступников.[7] Опасность, мало изученность и несовершенство мировых, локальных механизмов регулирования криптовалют создают почву для формирования и последующего развития опаснейших террористических организаций и движений.

3. Счета-воронки относятся к одному или нескольким банковским счетам, используемым для незаконных средств, депонированных в одном географическом местоположении, что дает преступникам немедленный доступ к деньгам путем снятия средств в другом географическом местоположении.[3]

4.Всемирная паутина – интернет открыл большие возможности для быстрого развития современной цивилизации, но вместе с тем в какой-то степени развязал руки самому опасному явлению современности – терроризму. Быстрому распространению терроризма, конечно, способствует непрерывная финансовая подпитка. Сложность выявления средств, которые направляются для финансирования терроризма и заключаются в тех возможностях интернета, которые порой позволяют без труда осуществлять такую деятельность. Так, к примеру, интернет-магазины, предлагают и распространяют аудио-, видео- пропаганду терроризма, всевозможную запрещённую литературу и т.п., которые продвигают различные радикальные террористические идеи среди своих клиентов, устраивают различные акции (рекрутинг), позволяющие заинтересовывать и увеличивать свою клиентуру, а значит и пополнять ряды террористов и, конечно же, получать колоссальную прибыль. Ещё одним из «излюбленных» методов финансовой подпитки у террористов всё больше становится – пожертвования .[4]

5. На сегодняшний день, серьёзную опасность в увеличении объёмов «отмытых» денег несут представители некоторых профессий, так, к примеру, уже достаточно часто используют термины «грязный бухгалтер», «грязный адвокат», «грязный нотариус». С развитием цифровых технологий и интернет услуг такие «грязные» специалисты получили возможность осуществлять свою преступную деятельность в онлайн режиме и даже размещать в сети рекламу своих услуг. Действительно,представители профессий, которые хорошо знают законодательство и имеют полное представление о слабых сторонах системы, представляют колоссальную опасность экономике.

6. Благотворительные фонды, гуманитарные фонды также являются актуальным методом и отмывания незаконных денежных средств, и финансирования терроризма.

7.Оффшорные зоны, банки и счета в них иностранных юридических лиц не всегда являются легальными и прозрачными. Оффшорные банки обладают повышенной привлекательностью среди преступных элементов, в том числе, и террористов.

Остановимся подробнее на деятельности оффшорных юрисдикций и банков.

В чём заключается повышенная привлекательность оффшорных юрисдикций в отмывании нелегальных средств?

❖ Финансовая секретность - высокий уровень секретности проводимых финансовых операций (иностранных субъектов, клиентов и т.д) это отличительная сторона оффшорных юрисдикций. Хотя можно сказать, что достаточно высокогоуровня секретности финансовых операций придерживаются многие страны, однако в случае, когда такие операции признаны преступными нормами международного права, секретность с таких операций может быть снята. Совершенно другой подход применяетсяв оффшорных юрисдикциях, где даже на государственном уровне гарантируется анонимность и секретность финансовых операций, невзирая на нормы международного права. Однако и здесь есть определённые нюансы, то есть не все оффшорные юрисдикции столь яростно защищают и сохраняют уровень секретности финансовых операций. Так, к примеру, Бермуды, жестко различают виды преступной деятельности на:

- неналоговые;
-налоговые.

Специфичность такого подхода заключается в том, что в случае совершения неналоговых преступлений, Бермуды оказывают почти полное содействие правоохранительным органам других стран в расследовании таких преступлений вплоть до снятия уровня секретности финансовых операций. Ситуация кардинально меняется в отношении налоговых преступлений, здесь Бермуды занимают твёрдую и порой жёсткую позицию сохранения секретности.

В Каймановых островах, которые были британской колонией, сохранение секретности финансовых операций является государственной политикой. Законодательство совершенствуется в пользу ужесточения ответственности за разглашение или нарушение секретности.

❖ Валютный контроль в оффшорных юрисдикциях четко разграничивается на: резидентов и нерезидентов. Такой подход имеет принципиальный характер.[2]

❖ Оффшорные банки, их специфичность заключается в том, что активно работают с депозитными и инвестиционными продуктами.

Из вышесказанного мы видим, что деятельность оффшорных банков открывает

серьёзные возможности для развития бизнеса, однако, мы не можем забывать о том, что банки такого типа, будто магнитом притягивают «грязные деньги» и способствуют проведению финансовых операций террористическими организациями и движениями.

Так в чём же заключается привлекательность оффшорных банков для терроризма?

Сначала определим, что мы понимаем под «оффшорными банками».

Во- первых, такой банк связывает множество различных по уровню и степени организации оффшорных банковских предприятий.

Во- вторых, их деятельность осуществляется в оффшорном режиме.

В- третьих, полномочие таких банков в какой-то мере ограничены возможностью обслуживать только иностранных клиентов, и операции, проводимые банками обычно не затрагивают саму оффшорную юрисдикцию.

В- четвёртых, в вопросе собственности банка, нужно отметь, что акционерами, собственниками могут быть только иностранные физические или юридические лица.[8]

Сегодня в мире функционируют чуть более десяти крупных оффшорных банковских центров, наиболее полуполярные из них расположены на Багамских, Каймановых островах, в Кипре, Панаме и т.д. Говоря о более мелких банковских юрисдикциях, нужно отметить, что они относительно молодые, но пользуются популярностью в преступной среде. Причиной такой притягательности является тот факт, что в этих юрисдикциях государственный контроль за деятельностью оффшорных банков минимизирован (Науру, Западное Самоа, Вануату, острова Кука и т.п). Создавая оффшорный банк в таких юрисдикциях, учредитель может даже не заботиться о том, что к нему могут быть предъявлены требования относительно размера капитала. Именно поэтому, ни у кого уже не вызывает большого удивления появление банков-призраков, которые создаются для осуществления преступной деятельности, операции или конкретной сделки. Именно поэтому в марте 1991 года Карибские власти отозвали более 300 лицензий таких банков, среди них были обнаружены банки, которые вели противозаконную деятельность с радикальными террористическими группами.

Рассмотрим механизмы отмывания денег в оффшорных банках.

Специфической чертой оффшорных банков является - создание ложной видимости легальности полученных незаконных денежных средств с последующими узакониванием. Так, к примеру, в некоторых оффшорных банках используют метод выдачификтивных кредитов, тем самым подтверждая, что имеющиеся в активе денежные средства «грязного» кредитополучателя являются совершенно легальными. Есть ещё один популярный метод «отмывания денег» - это «миксация» денежных средств, то есть легальные денежные средства перемешиваются с нелегальными и на выходе «грязные» денежные средства становятся уже вполне легальными. Опасность проведения таких операций заключается в том, что они непосредственно способствуют развитию преступности, торговли оружием, а также появлению новых и развитию имеющихся террористических организаций. Большая привлекательность оффшорных банков у большинства преступных организаций, объединений и лиц вызвано тем, что в основном преступные операции осуществляются на основе наличных денег, а концентрация большого количества наличных денег вызывает большие подозрения и неудобства.[5]

Основные недостатки при проведении операций с наличными:

Во-первых, наличие больших объёмов наличных денег является своеобразной «меткой», говорящей о высокой вероятности нелегального их происхождения, и такие средства обычно быстро попадают в поле зрение специальных органов.

Во-вторых, во многих странах на законодательном уровне введён лимит на вклады, инвестиции и другие операции, осуществляемые с помощью наличных денежных средств. То есть «грязные деньги» отмыть таким образом не представляется возможным.

В- третьих, покупка криптовалюты позволяет преступным и террористическим элементам не только закупать товары (в том числе расплачиваться за оружие, наркобизнес и т.п), но финансировать террористические акты в различных частях света.

В этой связи отметим, что оффшорные банки способны решить проблему с наличными деньгами путем изменения её формы, а это даёт возможность производить расчёты в безналичной форме. Безналичные расчёты, в свою очередь, не так сильно вызывают подозрения у соответствующих надзорных органов, тем самым преступные накопления могут быть «отмыты».

Выводы и предложения.

По результатам проведенного анализа, стало ясно, что процесс отмывания незаконных денежных средств находится в постоянном совершенствовании с использованием новейших технологий и подходов. Такое положение дел осложняет процесс предупреждения таких преступлений, выявление «грязных» денег и привлечение к ответственности лиц, совершающих эти преступления. Наибольшую

опасность представляет большая концентрация незаконных денежных средств в преступных руках, которая даёт возможность использование таких средств в целях дестабилизации общественной безопасности на различных уровнях (страны, региона, мира), развитию терроризма (продажа оружия, наркотических средств, торговля людьми и. т.п.).

В этой связи нами разработаны следующие предложения:

1.Исходя из того, что фиктивное кредитование и инвестирование посредством осуществления финансовых операций в оффшорных юрисдикциях, банках является наиболее распространенным способом отмывания денег, считаем необходимым в стране, а также в рамках деятельности ФАТF разработать механизм предоставления подробной кредитной истории лиц или организаций, компаний и т.д. которые осуществляли какую-либо финансовую операцию в оффшорных и «приоффшорных» банках. Эта жёсткая мера позволит не только более подробно отслеживать движение денежных средств, но и предупредить такие преступления.

2. Одна из самых больших проблем в процессе привлечения к ответственности лиц, совершивших финансовые преступления – это несовершенство законодательных и нормативно-правовых документов. В этой связи считаем необходимым проведение постоянного мониторинга практических сторон реализации таких документов, совершенствование этих норм на предмет их однозначности и конкретности в трактовке. Нормативно-правовые документы не должны оставлять возможность иной не предусмотренной законодателем трактовки, ибо это и есть лазейка для развития коррупции и финансовых преступлений.

3. Интернет стал мощным и удобным методом вовлечения активного населения – молодёжи в ряды различных террористических движений, а также для финансирования терроризма. В этой связи, считаем необходимым на государственном уровне ещё больше внимания уделить на подготовку высококвалифицированных специалистов в области кибер-, интернет безопасности с активным вовлечением специалистов-практиков в учебный процесс, установить сотрудничество с зарубежными вузами, занимающимися активной подготовкой таких кадров.

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Impact Factor:							
	ISRA (India)	= 6.317	SIS (USA)	= 0.912	ICV (Poland)	= 6.630
	ISI (Dubai, UAE)	= 1.582	РИНЦ (Russia)	= 3.939	PIF (India)	= 1.940
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	JIF	= 1.500	SJIF (Morocco)	= 7.184	OAJI (USA)	= 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 16.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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THE ROLE OF PAINTING IN THE ARTICAL DECORATION OF HISTORICAL MONUMENTS OF SHAHRISABZ

Abstract: *The article discusses the role and development of the art of painting used in the decoration of ancient monuments in the ancient and modern city of Shakhrisabz, emphasizing both the practical and educational aspects of the pattern. There are also suggestions that it would be easier for students to create a new work if they could memorize the elements of the pattern, as a result of which it would be better for students to visit and copy the monuments of folk art, which are examples of folk arts.*

Key words: *pattern, work, students, monuments, painting, composition.*

Language: *English*

Citation: Khaydarova, M. (2021). The role of painting in the artical decoration of historical monuments of shahrisabz. *ISJ Theoretical & Applied Science, 12 (104),* 720-725.

Soi: http://s-o-i.org/1.1/TAS-12-104-75 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.75

Scopus ASCC: *1200.*

Introduction

As we walk around my ancient land, my desert, my native land of Shakhrisabz, where my seventy-two bloods flowed, my heart is overwhelmed by the majesty of the ancient and young monuments. We want to be proud, we want the nation, we want the people. It is a place where the feelings that hit your body always enter your chest, and the steps are steadily suppressed ... Mother Shahrisabz. Once upon a time, our grandfather Amir Temur rode to Kesh in the same way. After all, Shahrisabz was also the future man of the Great Entrepreneur with a longing excitement. The fact that it was the holy land where his sons Jahangir Mirza and Umarshaikh Mirza and his father Muhammad Taragay and his spiritual teacher Shamsiddin Kulol were buried has also become the residence of the powerful ruler. "Without you, the dice of my history are a lie.Without you the place of my ancestors lies, O my heart, my city Shahri Kesh. I love you, I love you. “Indeed, starting from the foot of the statue of Amir Temur, we are amazed by the beautification of the city under the leadership of our President. The streets from the radically modified avenue to the Dorut-Tilavat complex are equipped with the latest night lighting, and the irrigation systems of the green areas have been completely renovated.

Picture 1.

Picture 2.

According to the government's program, Abdushukur Agalik Madrasah, Kunchiqar, Hovuzak Mardon, Malik Ajdar mosques, Koba caravanserai and 7 other historical facilities have been renovated and given a special look, which pleases not only tourists but also citizens of the city. It is no coincidence that Amir Temur Square, its surroundings have been expanded, a new, beautiful alley has been built to connect the historical monuments of the region, which has become an architectural complex. These huge creations testify to the fact that the city corresponds to the name "Qubbat ul-ilmi val-adab" ("Peak of Knowledge").

Literature analysis and methodology

First of all, the task of beautification and creative work in Shakhrisabz was the reconstruction of ancient monuments, the restoration of our lost national values, the restoration of flying patterns from historical monuments. In particular, the above-mentioned goals are shared in the organization of the traditional international art festival "Maqom" in Shahrisabz on the initiative of President Shavkat Mirziyoyev. So it is put. At the same time, we, as specialists in the field of art, have a great task ahead of us, especially in the field of art, in the active promotion of the concept of "Shahrisabz - the city of festivals", which demonstrates the huge potential of the city as a center of culture and tourism.

Picture 3.

Thus, when we talk about the role of the art of painting in the artistic decoration of historical monuments in the city of Shakhrisabz, first of all, it is necessary to dwell on the construction process of historical monuments erected here.

In fact, the Dorus-saodat ensemble, which adorns the splendor of Shahrisabz with its splendor, consists of three parts, namely, the tomb of Jahangir Mirza, the mosque of Hazrati Imam and the mausoleum of Temur. Also, Dome Seyidon is the dome of Sayyids. Although the building is small, it fascinates with its elegant proportions and wonderfully crafted entrance door covered with deep carved patterns.

The heart of Shakhrisabz, the Oqsaroy, known as the "Taj Mahal", is a symbol of the skillful beauty of the masters of nature, who spent the most time on makeup and used a variety of needlework.

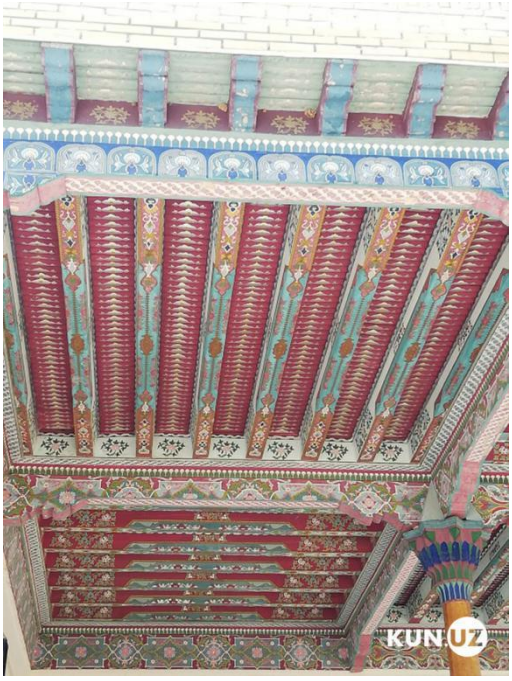
The Kunduzak Mosque is one of the monuments with another miraculous pattern. It was built in the 19th century. It is located not far from Dorus-Tilovat madrasah.

An example of wonder and miracles is another monument that cannot be missed without looking at it. In the language of the Shahrisabz people, this building is "Maliki Ashtar", which has become a "Malian dragon". It means Tuyador, and this mosque was built to be a temporary shelter by the camel caravan traders who travel in trade caravans. Today, it is a complex of buildings consisting of mosques and cells located around the courtyard. The most important of these is the room, the dome of which is higher than the roofs of nearby houses. The architectural solution is specific to the neighborhood mosques.

Feedback and suggestions

Indeed, painting as an art form has long been an important part of Uzbek culture. Over the centuries, his artistic traditions have emerged. In the patterns, unlike all other types of art, it is seen that the generations are closely intertwined, the continuity of national traditions. Traditions of painting as a method of studying this type of art are also passed from grandfather to father, from father to son.

Due to this continuity, the art of painting has survived to this day. The best examples of the pattern are characterized by the expediency and beauty of the shapes combined through rich creative imagination. This reflects the difference in the views of folk masters on the environment. The game of drawing in a pattern, like the melody in music, consists of "a great generalization of the life experience of the people," such as a song and a fairy tale. Artistic painting is the art of creating beauty in the harmony of colors and in unique compositions. In his work, the master painter skillfully uses the natural brilliance and harmony of colors, elegant form, material texture to achieve a bright expression.



Picture 4.

By the way, Naqsh is an Arabic image, which means flower. In Shahrisabz monuments, painting can be seen mainly in the decoration of ceilings, silent vodka, palace columns, mosques, schools, houses of the rich, wooden items. Attention is drawn to the rhythmic movement of intertwined twigs, horns and luxuriously depicted flowers in delicate plant-geometric patterns, the islimi in the works of Uzbek masters and the classical motifs of girih patterns adapted to the shape of the ceilings. The pattern served to decorate more interiors and covered porches, porches.

Discussion and results

When we look at the monuments of Shakhrisabz, we see drawings on the roofs of the building, such as flowers, leaves, twigs, ropes, flowers. It is known that flowers are an element of Islamic patterns, which give the patterns more beauty and elegance after the decoration is done. In buildings, too, floral elements are placed mainly in the central parts of the pattern forms. In addition, the rod - a plant-like pattern element, was used even more effectively. Flowers, leaves, fruits and other elements are intertwined and complemented. In the visible ruta, morpech, munabbat, orange, and various intricate pattern compositions, rod elements are found in single and double bands.

Picture 5.

Tanob - creates basic shape paths in pattern patterns. Such form names are called altar, medohil pepper, flange, and so on. Madohil is an element of Islamic pattern. Madohil occurs in the form of tulips, tumors, shapes reminiscent of the appearance of a triangle. Shkufta is an element of Islamic pattern. Also

known as shorts. The main shape-forming elements in the cupboard are interconnected in the form of buds. Symbolic patterns - pigeons, lions, fish, the state emblem, and in the past, more leaf images are used to draw artistic patterns. In this case, the leaf is depicted in delicate, elegant looks, as it is one of the elements of the Islamic pattern. Painters have long used the leaves of willow, pomegranate, date, almond, sambit, henna, rose, grape, etc. to create a pattern composition. They decorated the ancient monuments of our ancestors with elegant patterns and sang their dreams, hopes, loves and wishes through them. The painter, our ancestors studied the human psyche very deeply and comprehensively and enriched them with wonderful patterns and motifs. In a patterned house, people live in peace, tranquility, longevity, wise ancestors for centuries based on life experiences. To know the language of painting, it is necessary to know the symbolic alphabet of each element and color of the pattern. It consists of stylized elements of patterns. Shahrisabz painting has been world famous since ancient times. The magnificent buildings built by our ancestors in the past have not lost their charm to this day. The tastefully crafted patterns continue to amaze us. Our national patterns have a very rich meaning. From simple spoons, bowls, boxes, chests, swings, musical instruments, household items and patterns on the walls and ceilings of public buildings, one is amazed and thought-provoking. These beautiful patterns were created by painters and have been shaped and developed over the centuries, perfected in connection with the development of architecture and fine arts. In addition, orange, anorgul, margula, Islamic patterns were used in the architectural monuments. The orange pattern is in the form of a lemon, suspended as a composition, attached to any pattern, in the form of a circle, 5-10-pointed star, oval, rhombus, ellipse. On the roofs of the monuments, a simple pattern was used on the edge of the rectangular composition, ie orange in the middle of the ruta. The painters also made extensive use of the anorgul pattern. This type of pattern adds beauty to the interior as a symbol of richness and luxury in life. Islamic patterns were used as a pattern of leaves, flowers, buds, and ropes being formed by repeating them together.

Margula is a double-lined gajak, an element of a plant-like pattern can also be seen.

Conclusion

Thus, the study of applied and artistic decorative art allows young people to stylize the surrounding objects, develop artistic thinking, creativity, visual memory, spatial imagination, aesthetic attitude to works of art, love of beauty, composition issues in applied and artistic decorative arts, patterns. , theoretically teaches and develops their aesthetic tastes by introducing modern symbols in artistic painting, the role of decorative art in the educational process, composition, fonts, advertising, proclamation, slogans, congratulatory text samples, decorative decoration in interior and exterior .

The monuments of Shakhrisabz are the greatest practical map for the development of future masters of art. In the historical buildings of Shahrisabz, such as palaces, mosques, madrasas, students always serve as a foundation for the creation of their own creative works of art. The conveniences created in the museums, exhibitions and expositions of the country in these institutions give the student a great benefit in a complex process, such as the use of elements of decorative and applied arts in art.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 20.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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POSSIBILITIES OF THE QUALITY MANAGEMENT SYSTEM FOR CHOOSING THE OPTIMAL STRATEGY FOR THE PRODUCTION OF CHILDREN'S CLOTHING THAT IS IN DEMAND AND PREFERRED BY CONSUMERS

Abstract: *in the article, the authors believe that the need to improve the quality management system at light industry enterprises is due to the following important reasons. Firstly, it is an increase in the confidence of potential consumers in the products that this company produces. Secondly, it is an opportunity to significantly strengthen its position in existing markets, as well as significantly expand its spheres of influence by entering new domestic and foreign markets. And thirdly, it is a significant increase in labor productivity of any industrial enterprise, where it is supposed to implement QMS using effective forms of management. The authors carried out an analysis of the possibility of the company's policy and goals for quality assurance within the quality management system (QMS), which will allow us to visualize the effectiveness and efficiency of the quality policy and goals developed by the authors within the QMS to ensure defect-free production with a significant reduction in the production of defective products.*

Key words: *quality, import substitution, demand, competitiveness, market, profit, demand, buyer, manufacturer, financial stability, sustainable TPP, attractiveness, assortment, assortment policy, demand, sales. paradigm, economic policy, economic analysis, team, success.*

Language: *English*

Citation: Blagorodov, A. A., Prokhorov, V. T., Lopatchenko, T. P., & Volkova, G. Y. (2021). Possibilities of the quality management system for choosing the optimal strategy for the production of children's clothing that is in demand and preferred by consumers. *ISJ Theoretical & Applied Science, 12 (104)*, 726-762.

Soi: http://s-o-i.org/1.1/TAS-12-104-76 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2021.12.104.76

Scopus ASCC: *2000.*

Introduction

UDC 675 .14: 317.47

Production efficiency - the ratio between the results obtained in the production of products, on the one hand, and labor costs and funds for production - on the other, is the most important quality indicator of the economy, its technical equipment and labor qualifications. Comparison of costs and benefits is used in the practice of managing firms, enterprises and other economic entities. The main indicators of production efficiency are: labor productivity; capital intensity of a unit of GDP or specific types of products; return on assets of a unit of fixed assets; material consumption per unit of GDP or specific types of products; the ratio of extensive and intensive factors in GDP growth; competitiveness of manufactured products; payback period, etc.

Product quality assurance comes with a cost. The quality of the product should guarantee the consumer satisfaction of his needs, its reliability and cost savings. These properties are formed in the course of the entire reproductive activity of the enterprise, at all its stages and in all links. Together with them, the value of the product is formed, which characterizes these properties from planning product development to its implementation and after-sales service. Reclamation is a claim made by the buyer to the seller in connection with the discrepancy between the quality or quantity of the supplied goods with the terms of the contract. Complaints can only be made on such issues that were not the subject of acceptance of the goods, made in accordance with the terms of the contract.

The policy of the enterprise should initially aim at high quality products. However, marriage, which is its opposite, can occur in any enterprise. It must be taken into account. Defects can be found in the manufacturing enterprise itself and outside of it. A defect that manifests itself in the sale or in the process of using products indicates both the poor quality of the products and the quality of the enterprise. Complaints are compared in terms of cost and quantity with the previous period. They are calculated for 100, 1000, 10000 products, depending on the volume of production. The appearance of complaints causes the manufacturer not only material, but also moral damage, affecting his reputation. The purpose of developing the STO standard is:

- reduction of marriage;
- improving the quality of product manufacturing.
- increasing the volume of sales.

The volume of sales of O1R products manufactured by OJSC Gloria Jeans is 14 million rubles.

Losses from complaints amount to 2.4% of the sales volume. The costs for the development and implementation of the standard, according to the enterprise, amounted to 537 650 rubles. (Ztek). As a result of the implementation of the organization's standard, the quality of the products of OJSC Gloria Jeans will increase, which will reduce losses from claims and fines to 1.2%. Savings from reduced rejects Eb, rub., Is determined by the following formula:

$$Э_б = \frac{a_1 - a_2}{100} \cdot O_p, \quad (1)$$

where a1 and a2 are the percentage of rejects before and after the implementation of measures, %.

$$Э_б = \frac{2{,}4 - 1{,}2}{100} \cdot 14000000 = 168000 \text{ rub.} \quad (2)$$

The economic effect Eph, rubles, is calculated using the following formula:

Ef = Eb - Ztek, (3)

where Etot is the savings from the reduction of marriage, rubles; Ztek - operating costs, rubles;
Eph = 168,000 - 537,650 = 369,650 rubles.

The results obtained confirm the effectiveness and expediency of the development and implementation of STO QMS XX. XXX-2016 “Measurement, analysis and improvement. General Provisions. Analysis of the reasons for the receipt of inappropriate products and defects at Gloria Jeans OJSC and the development of corrective and preventive actions. "Development and implementation of the standard STO SMK XX. XXX-2016 "Management of nonconforming products in production" made it possible to reduce the cost of products that have deviations, or unusable products, through the timely detection and correction of inconsistencies. STO determines the general procedure for the management of nonconforming products, as well as the conditions for the identification, registration,

The economic indicators from the implementation of the organization standard STO SMK XX were calculated. XXX-2016 "Management of nonconforming products in production" at JSC "Gloria Jeans", namely:

- savings from reducing rejects;
- economic effect, confirmed the effectiveness of the proposed measures within the framework of the QMS

The general weakening of the Russian light industry as a result of the collapse of production in the early 1990s and the simultaneous growth of the market due to the massive influx of cheap imports, which still prevail at the moment, determine the urgency of the problem of forming a competitive assortment of children's clothes, which leads to the development of recommendations for the development of an optimal strategy for the release of products in demand by the population of these regions.

In light of the current foreign policy situation, caused by the influence of economic sanctions imposed by many developed countries against Russia, the issues of increasing the competitiveness of Russian products in order to provide it with reasonable

import substitution, as well as to realize opportunities for the development of their own industries, are of particular importance. The object of this study is the processes of developing solutions that ensure the release of modern products in demand. The subject of the research is clothing for children of the preschool age group.

The aim of the research is to search for opportunities to increase the competitiveness of children's clothing produced in the regions of the Southern Federal District and the North Caucasus Federal District. To achieve this goal, the following tasks are supposed to be solved:

- studying the possibilities of filling the Russian market with children's clothing from a domestic manufacturer and comparing them with the current directions of the implementation of the Light Industry Development Strategy;
- assessment of the needs of the regional markets of the Southern Federal District and the North Caucasus Federal District in meeting the demand for Russian-made products;
- study of the features that affect the formation of the range of children's clothing and the solution of questions of demand and sale of clothing for children, as well as the requirements for children's clothing;
- development of effective recommendations for the formation of a demanded range of clothing for children, taking into account the identified features;
- development of proposals for increasing the flexibility of technological processes at enterprises.

The theoretical and practical significance of the research is determined by: segmentation of the consumer market for children's clothing in the Southern Federal District and the North Caucasus Federal District; identifying the criteria that determine the quality of children's clothing in the eyes of consumers in the regions of the Southern Federal District and the North Caucasus Federal District; determination of the characteristics of the assortment of products and parameters that determine the demand for it; a system for forming an assortment of children's clothing, which can become the basis for the assortment policy of manufacturers of children's clothing in the Southern Federal District and the North Caucasus Federal District; conditions for the development of small and medium-sized producers of children's clothing in the South.

The research was based on an integrated systematic approach to solving problems in the development of a competitive range of clothing designed for children of the preschool age group using the capabilities of modern information technologies. In the course of the research, the method of deductive assessment of the state of the economy and the work of the light industry of the regions under consideration was used, as well as the method of questioning to take into account the opinions of consumers when predicting the assortment.

The information-theoretical basis for the research used technological, legislative and regulatory-technical documentation, theoretical and scientific-practical foundations of children's anatomy and physiology, manufacturing technology of garments and the properties of materials.

Main part

Geographic features of the regions of the Southern Federal District and the North Caucasus Federal District and the assessment of the size of the child population.

The Southern Federal District (SFD) is one of the eight federal districts of the Russian Federation, located in the south of its European part. The Okrug includes eight constituent entities of the Russian Federation: the Republic of Adygea, Astrakhan Region, Volgograd Region, Republic of Kalmykia, Krasnodar Territory, Republic of Crimea, Rostov Region and the federal city of Sevastopol - with a population of 16 428 458 people (11.19% of the population of the Russian Federation) and an area of 447,840 km² (2.61% of the area of the territory of the Russian Federation). Figure 1 schematically shows the location of the regions of the Southern Federal District, table 1 shows their characteristics as of 01.01.2022. In the west and north-west, the territory of the Southern Federal District borders on Ukraine, in the east - on Kazakhstan. In the south, it borders on Abkhazia and the North Caucasian Federal District, and in the north - on the Central and Volga Federal Districts. In the east, the federal district is bounded by the Caspian Sea, in the west - by the Black Sea. The climate in most of the district is temperate continental, moving south from the semi-dry Mediterranean to the humid subtropical.

More common in the Rostov region are the air masses of temperate latitudes brought by cyclones from the Atlantic Ocean and anticyclones from Siberia, however, the location of the district is close to the border of the temperate and subtropical climatic zones and contributes to the frequent penetration of tropical air masses - sea from the Mediterranean, continental from Central Asia, Iran , Arabia. Arctic air masses bring a sharp cooling in winter, frosts in late spring and early autumn, and drought and heat in summer.

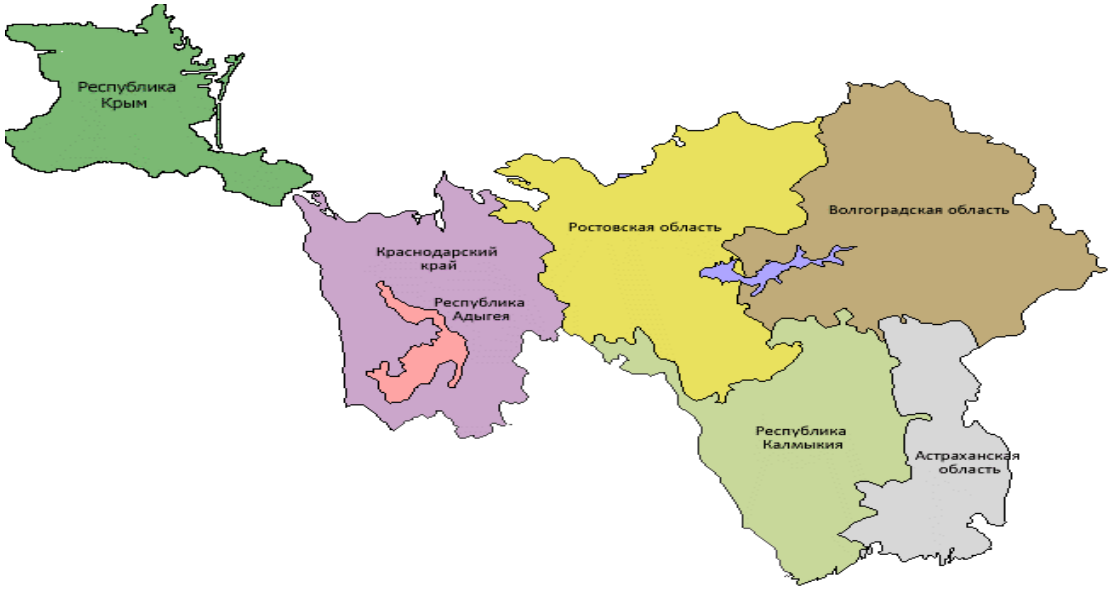


Figure 1. Regions forming the Southern Federal District

Table 1. Characteristics of the regions that make up the Southern Federal District

No.	Flag	Subject of the federation	Area, km²	Population, people	Administrative center
1		Republic of Adygea	7 792	453 366	Maykop
2		Astrakhan region	49,024	1,018,866	Astrakhan
3		Volgograd region	112,877	2 535 202	Volgograd
4		Republic of Kalmykia	74731	277,803	Elista
5		Krasnodar region	75485	5 570 945	Krasnodar
6		Republic of Crimea	26100	1 912 168	Simferopol
7		Rostov region	100967	4 231 355	Rostov-on-Don
8		the city of Sevastopol	864	428,753	Sevastopol
		Southern Federal District	447840	16 428 458	Rostov-on-Don

The average annual air temperature is + 6.5 ° C, varying from + 8.5 ° C in the south to plus 4.5 ° C in the north. The coldest month is January with an average temperature of minus 6.5 ° C, and the warmest month is July with an average monthly temperature of + 23 ° C. The amount of precipitation per year ranges from 600 - 700 mm in the north to 1500 - 1600 mm in the south of the Black Sea region.

The Okrug ranks third among the federal districts in terms of population, which indicates large labor reserves and a significant volume of the domestic market. The population density of the district is 36.7 people / km². The urban population predominates - 62.41%. The ethnic composition is dominated by Russians - over 83%, followed by Armenians - over 3%, then - Ukrainians - over 1.5%, Kazakhs - almost 1.5%, Kalmyks - over 1.2%, Tatars - almost 1% and about 11.8% are representatives of other nationalities. An estimate of the number of children living in the regions of the Southern Federal District is given in Table 2, for clarity, the data are supplemented with diagrams (Figures 2 and 3).

Table 2. The number of children in the regions of the Southern Federal District (as of 01.01.2022)

Subject of the federation	Population	Children	Girls	Boys
Krasnodar region	5 570 945	1 114 189	668 513	445676
Rostov region	4 231 355	846 271	507,763	338,508
Volgograd region	2 535 202	507,040	304,224	202,816
Republic of Crimea	1 912 168	382,434	229,460	152,974
Astrakhan region	1,018,866	203,773	122,264	81,509
Republic of Adygea	453 366	90 673	54404	36269
Sevastopol city	428,753	85751	51451	34300
Republic of Kalmykia	277,803	55 561	33337	22224
Southern Federal District	16 428 458	3,285,692	1 971 415	1,314,277

Figure 2. The ratio of the number of children by regions of the Southern Federal District

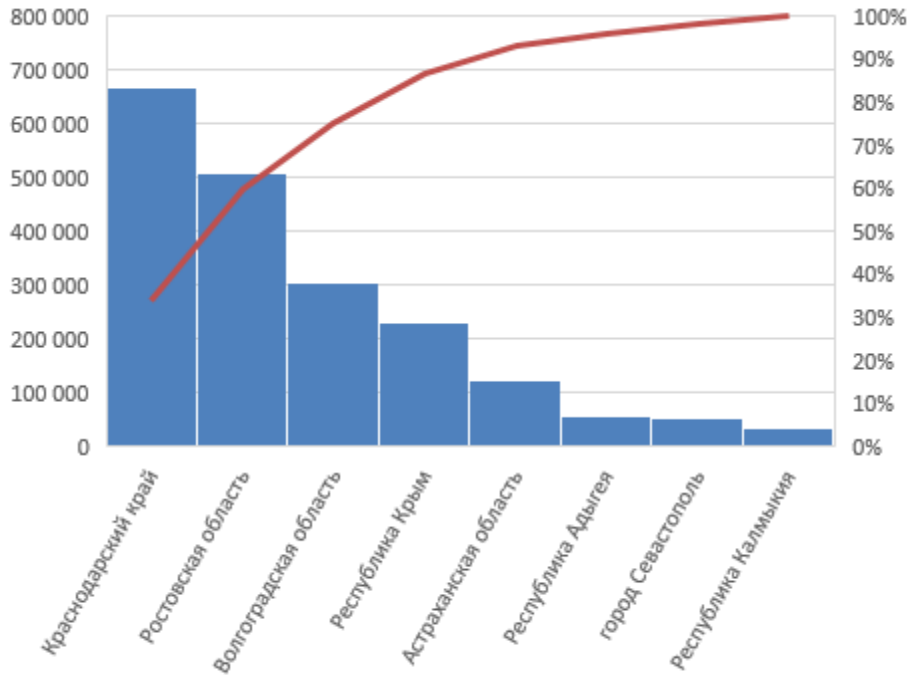


Figure 3. Accumulated percentage of the number of children by regions of the Southern Federal District

Thus, most of the children (76%) are concentrated in three regions of the Southern Federal District of eight - Krasnodar Territory, Rostov and Volgograd Regions, which also explains largest market share children's clothing from these regions among the rest in the Southern Federal District.

The North Caucasian Federal District (NCFD) is located south of the Southern Federal District, includes seven Russian regions, of which six republics: Dagestan, Ingushetia, Kabardino-Balkarian, Karachay-Cherkess, Chechen, North Ossetia-Alania and one territory - Stavropol, in the territory (170 439 km², 1% of the total Russian) of which 9,775,770 people live, which is 6.66% of the population of Russia. Figure 4 schematically shows the location of the regions of the North Caucasus Federal District, table 3 shows their characteristics as of 01.01.2022.

Figure 4. Regions forming the North Caucasus Federal District

Table 3. Characteristics of the regions that make up the North Caucasus Federal District

No.	Flag	Subject of the federation	Area, km²	Population, people *	Administrative center
1	2	3	4	5	6
1		The Republic of Dagestan	50270	3,041,900	Makhachkala
2		The Republic of Ingushetia	3628	480 474	Magas
3		Kabardino-Balkar Republic	12 470	864 454	Nalchik
4		Karachay-Cherkess Republic	14277	466,432	Cherkessk
5		Republic of North Ossetia - Alania	7987	703 262	Vladikavkaz
6		Stavropol region	66160	2 804 383	Stavropol
7		Chechen Republic	15647	1,414,865	Grozny
		North Caucasus Federal District	170,439	9,775,770	Pyatigorsk

The territory of the district has land borders with the Southern Federal District (Rostov Region, Kalmykia, Krasnodar Territory), as well as with Abkhazia, Azerbaijan, Georgia and South Ossetia, and water borders with Kazakhstan. From the east, the North Caucasus Federal District is washed by the waters of the Caspian Sea, from the south, the district is bounded by the Main Caucasian ridge. The variety of relief and the proximity of the Azov, Caspian and Black Seas form a rather favorable climate on the territory of the Okrug throughout the year. In January, the average temperature is minus 3.2 ° C, in July - plus 20.4 ° C. The amount of precipitation in the plain is 300 - 500 mm per year, in the foothills - over 600 mm.

Table 4. The number of children in the regions of the North Caucasus Federal District (as of 01.01.2022)

Subject of the federation	Population	Children	Girls	Boys
The Republic of Dagestan	3,041,900	608 380	365 028	243 352
Stavropol region	2 804 383	560 877	336 526	224 351
Chechen Republic	1,414,865	282,973	169,784	113189
Kabardino-Balkar Republic	864 454	172,891	103,735	69,156
Republic of North Ossetia - Alania	703 262	140652	84 391	56 261
The Republic of Ingushetia	480 474	96,095	57657	38 438
Karachay-Cherkess Republic	466,432	93,286	55 972	37314
North Caucasus Federal District	9,775,770	1 955 154	1,173,093	782061

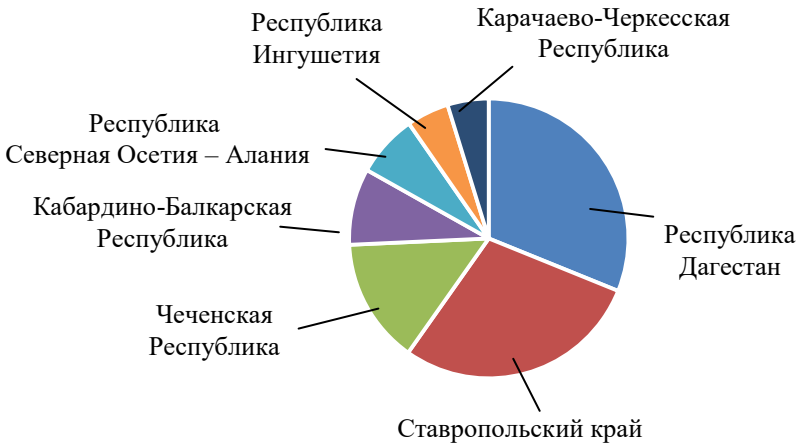


Figure 5. The ratio of the number of children by regions of the North Caucasus Federal District

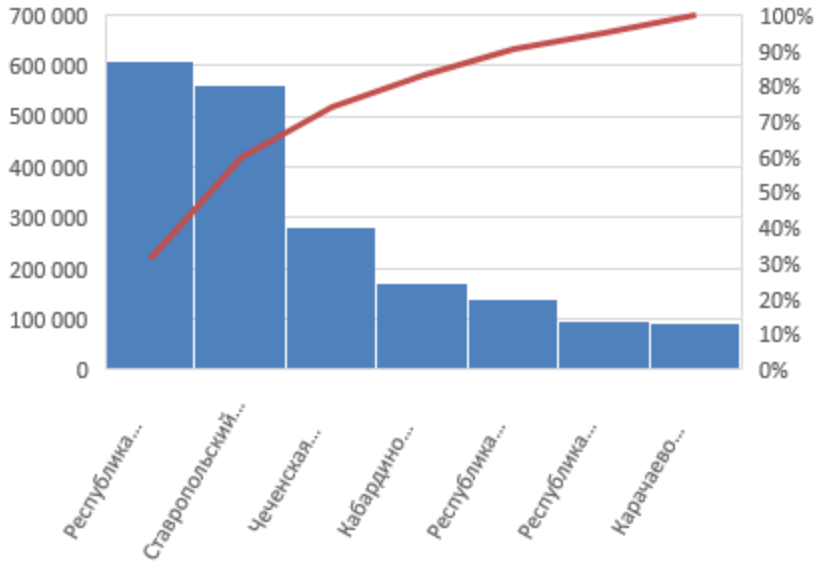


Figure 6. Accumulated percentage of the number of children by regions of the North Caucasus Federal District

The population density of the North Caucasus Federal District is high - the second in Russia - 57.36 people / km2, the rural population predominates - 50.86%. The district is characterized by the highest population growth among the rest (+3.44% over the past five years). According to the results of the last

All-Russian population census, the ethnic composition of the district's population is quite diverse: Russians - 30.26%, Chechens - 14.17%, Avars - 9.18%, Dargins - 5.74%, Kabardins - 5.33%, Ossetians - 5.11%, Kumyks - 4.95%, Ingush - 4.44%, Lezgins - 4.2%, Karachais - 2.39%, Armenians - 2.02%, Laks - 1.77%, Azerbaijanis - 1.65%, Tabasaran - 1.36%, Balkars - 1.17% and 6.26% - representatives of other nationalities. An estimate of the number of children living in the regions of the North Caucasus Federal District is given in Table 4, the data are also supplemented with diagrams,

Judging by the data presented, most of the children (74%) are concentrated in three out of seven regions of the North Caucasus Federal District - the Republics of Dagestan and Chechen and in the Stavropol Territory.

In the context of a growing market with the dominance of imported products of stable demand for modern Russian enterprises in the South and North Caucasus Federal Districts, the problems of forming a competitive assortment of children's clothing based on marketing information and studying regional characteristics of consumer demand are urgent. The management of the competitiveness of products is associated with a frequent change in the assortment and an increase in the influence of regional socio-economic factors, its increase is possible only through the development of new models based on constantly updated marketing information and an in-depth study of the preferences of specific groups of buyers, accelerating the process of changing the assortment while maintaining or increasing efficiency production system. Manufacturers need to move away from price competition,

A competent assortment policy is needed for the production of competitive children's clothing, taking into account the factors that affect its consumer demand:

- compliance with the main fashion trends,
- take into account the economic, social and climatic characteristics of the regions of the Southern Federal District and the North Caucasus Federal District;
- the use of innovative materials;
- if possible, create a basis for a wealthy consumer to meet his demand for clothing of higher quality.

The formation of an assortment of children's clothing is a complex of issues related to specific goods, their individual series, with the determination of the relationship between the "old" and "new" goods, single and batch production, "science-intensive" and "ordinary" goods, materialized goods and production methods ... When forming the assortment, problems of prices, quality, guarantees, service arise, whether the manufacturer is going to play the role of a leader in creating fundamentally new types of products or is forced to follow other manufacturers.

The formation of the assortment is preceded by the development of an assortment concept by the enterprise, which is a directed construction of the optimal assortment structure, product offer, while, on the one hand, the consumer requirements of certain groups (market segments) are taken as a basis, and on the other, the need to ensure the most efficient use of raw materials by the enterprise. , technological, financial and other resources in order to produce products at low costs.

The assortment concept is expressed in the form of a system of indicators characterizing the possibilities of optimal development of the production assortment of a given type of goods. These indicators include: a variety of types and varieties of goods (taking into account the typology of consumers); the level and frequency of the assortment renewal; the level and ratio of prices for goods of this type, etc. The system of forming an assortment of children's clothing includes the following main points:

- determination of current and prospective needs of buyers, analysis of the specifics of purchasing behavior in the relevant market;
- assessment of existing competitors' analogues;
- a critical assessment of the products manufactured by the enterprise in the same assortment from the point of view of the consumer;
- solving issues of which products should be added to the assortment, and which ones should be excluded from it due to changes in the level of competitiveness;
- consideration of proposals for the creation of new product samples, improvement of existing ones;
- development of specifications for new or improved models in accordance with the requirements of buyers;
- exploring the possibilities of producing new or improved models, including issues of prices, costs and profitability;
- conducting tests, taking into account the possible use in order to clarify their acceptability for the main indicators;
- development of special recommendations for the production departments of the enterprise regarding quality, style, price, name, packaging, service, etc. in accordance with the results of the tests carried out, confirming the acceptability of the characteristics of the product or predetermining the need to change them;
- assessment and revision of the entire range.

Of particular importance in such a situation is the role played by certain positions in the assortment. For this, manufactured products can be classified into the following groups:

- the main group of goods (which bring the main profit and are in the stage of growth);

- a supporting group of products (products that stabilize sales proceeds and are at a stage of maturity);
- strategic group of goods (goods designed to ensure the future profit of the company);
- tactical group of goods (goods designed to stimulate sales of the main product group and are in the stage of growth and maturity);
- a group of products under development (products that are not present on the market, but ready to enter the market);
- goods leaving the market (which do not bring profit and must be removed from production, removed from the market).

After that, it is necessary to determine the share of each group in the total volume of products, which makes it possible to assess the existing assortment set at the enterprise and, correlating it with the profit received, to assess the correctness of the assortment planning, its balance. For a stable position of the enterprise in the assortment structure, the main and supporting groups of goods must be at least 70%. In addition, an increase in the volume of goods of groups that generate the main income will not always increase the company's profits. Here it is important to pay attention to the remainder of unsold goods (what increase it will give and the possibility of its further sale).

It is necessary to monitor that the offered range of children's clothing does not include too many product names. For the majority of Russian enterprises, the main reserve for assortment optimization still lies in a significant reduction in the assortment range. Too large assortment has a bad effect on economic indicators - there are many positions that cannot even reach the break-even level in terms of sales. As a result, the overall profitability drops dramatically. Only the exclusion of unprofitable and unprofitable items from the assortment can give production an increase in overall profitability of up to 50%. In addition, a large assortment diffuses the strength of the enterprise, makes it difficult to correctly offer goods to customers, and scatters the attention of end consumers.

Research data from psychologists indicate that the average person is capable of simultaneously perceiving no more than 5 - 7 (sometimes up to 9) meaningful constructive decisions. Thus, a person, making a choice, first chooses these same 5 - 7 options based on the same number of criteria. If the seller offers too many selection criteria, the buyer begins to feel discomfort and independently weeds out criteria that are insignificant from his point of view, which often leads to the cancellation of the purchase or to the choice of an outdated (familiar) model. From the point of view of the buyer, in order to ensure a calm choice from the perceivable options, the assortment should consist of no more than 5 - 7 groups of 5 - 7 items, i.e. from the point of view of perception, the entire assortment should ideally consist of 25 - 50 items.

It is generally accepted that the customer wants a wide range of products. This widest assortment is often referred to even as a competitive advantage. But in fact, it turns out that for a manufacturer a wide assortment is hundreds of product names, and for a consumer - 7 items is already more than enough. Consequently, the consumer does not need a wide assortment at all, but the variety he needs.

An important feature that affects the formation of an assortment of children's clothing by an enterprise is market segmentation, that is, activities to identify potential consumer groups of specific types of goods. Segmentation focuses on differences in the behavior of different types of buyers in their respective markets. At the same time, the target segment is understood as a homogeneous typical group of buyers with similar needs and habits in relation to certain types of goods. The result of segmentation is the specification of the types of consumers in a given market. For businesses, customer segmentation is the basis for adjusting the existing assortment structure or for developing new models. Besides,

The choice of the optimal assortment of clothes for children, the most demanded by the population, meeting the current fashion and quality requirements adopted in the international market, is a prerequisite for the effective operation of the enterprise. The formation of an assortment of children's clothing, taking into account its competitiveness, is a process carried out taking into account the analysis of the existing market, as well as taking into account the forecasting of trends in the social, economic and industrial areas.

The formation of the assortment is preceded by the development of the assortment concept by the enterprise, i.e., the directed construction of the optimal structure of the products produced, while the basis is, on the one hand, the need to ensure the most efficient use of raw materials, technological, financial and other resources by the enterprise in order to produce products with low costs, and on the other hand, meeting the requirements of certain groups of consumers, taking into account their characteristics and capabilities.

The assortment policy for the creation and production of competitive children's clothing, taking into account current marketing approaches, is based on a group of principles based on the understanding of the need to develop only what the consumer needs. Even when developing products that have no analogues, while having only potential demand, it is necessary to carry out a set of measures to determine the needs for it:

- release trial lots, organize meetings with private and public consumers;
- to create a variety of assortment within the framework of commodity differentiated marketing;
- before the introduction of the model into production, the market segment for which it is

intended within the framework of targeted marketing must be determined;

- it is necessary to predict the properties of the product during operation.

Thus, the choice of assortment policy is seen as part of the strategic planning process. The choice of strategy depends, first of all, on the resources of the enterprise - when developing an assortment, there is a high probability of dissipation of funds. Assortment planning and management is an integral part of marketing. Even well-thought-out sales and advertising plans will not be able to neutralize the consequences of mistakes made earlier in assortment planning. An optimal assortment structure should ensure maximum profitability, on the one hand, and sufficient stability of economic and marketing indicators (in particular, sales volume), on the other hand. The existing measures of state support are designed to ensure the financial stability of enterprises.

In market conditions of management, an effective management system requires a rational organization of marketing activities, which largely determines the level of use of production means at the enterprise, an increase in labor productivity, a decrease in production costs, an increase in profits and profitability. This is due to the fact that sales activities are not only the sale of finished products, but also the orientation of production towards satisfying the effective demand of buyers and active work in the market to maintain and form demand for the company's products, and organize effective channels for the distribution and promotion of goods.

An effective tool for maintaining high demand for the products manufactured by the company is marketing, the initial stage of which is the study of market opportunities and the assessment of financial investments. Marketing research gives a company an idea of the differences between buyers in their needs, perceptions, and preferences.

At the enterprise, the marketing department must closely monitor the dynamics of sales and profits in order to take appropriate measures in time. So, for example, with a decrease in the rate of sales, you need to think about new markets, adjusting the price of the manufactured assortment, and improving service. Each enterprise needs a policy, the basis of which should be an assessment of its real capabilities, so that any samples of children's clothing that are newly introduced to the market would serve as its position and competitive advantage. Within the framework of the product strategy, specialists determine market demands and ways to satisfy them, based on the study of consumer demand and its characteristics.

The activity of a sewing company is carried out in a constantly changing economic environment with the solution of one goal - to obtain maximum profit. In a market economy, when prices and volumes of production are dictated by the market, an enterprise always faces a choice of how much to produce at the current market price in order to get the desired profit. To properly plan a marketing strategy, you first need to analyze the current situation, understand your own resources, and then look for ways to solve the intended goals. On the one hand, this is a thorough study of the market for demand and needs, the orientation of production to these requirements, on the other, an active influence on the market, on the formation of needs and consumer preferences.

To create a competitive advantage from a marketing point of view, an enterprise must analyze the existing demands of potential customers and determine what matters most to them. This also requires the use of a set of marketing techniques: branding, participation in industry exhibitions, the use of various advertising options, assortment policy. Equally important for maintaining the sustainable development of the production of children's clothing is to determine the period of the economic life of the model and optimize the period of the product's existence through rational pricing and the correct application of marketing techniques.

In addition, in order to avoid problems with implementation, the creation of new models in the design departments of the enterprise should be carried out after a preliminary study of the real market needs for these products. Indeed, as the experience of Russian enterprises shows, the main reason for the sales crisis is the inconsistency of the range of manufactured products with the structure of consumer demand. In most cases, domestic producers tend to sell what they produce rather than produce what can be sold. This is due to the fact that for most of them the problem of sales orientation is more relevant than marketing. This situation can be explained by the following reasons:

- commodity producers are forced to concentrate their efforts on the product, and not on the needs of consumers, since they have very limited investment opportunities;

- a wide range of products is possible in the presence of flexible industries, the introduction of which is constrained by technological backwardness;

- for the production program to be determined by marketers, it is necessary not only flexible production, but also the presence of significant production reserves, including reserves of production capacities, financial resources, etc.;

- the possibility of using prices of market equilibrium and the advantage of non-price methods of competition for domestic producers are limited by the lack of professional marketers;

- the relatively narrow planning horizons for our businessmen are determined by the still continuing economic and political instability of Russian society.

This also explains the price orientation of the business to maximize current profits, to hide it for taxation, and not to obtain a long-term effect from the

market orientation of production. The enterprise takes care of its costs, developing measures to reduce them by improving equipment and technology, introducing new types of materials into production, constantly improving the quality of manufactured products - all this requires large financial costs, but, nevertheless, contributes to an increase in competitiveness as separate types products, and the enterprise as a whole. With the transition from the seller's market to the buyer's market, the competitiveness of an enterprise increasingly depends on how perfect and viable its marketing and sales of products are.

Supply, demand and prices are elements of the market mechanism. Production, in essence, is a link between demand and supply, which acts as a result of production activities and represents a batch of children's clothing intended for sale, the price of which must be sufficient to reimburse all costs (fixed and variable) for its production, management , implementation, and provide an acceptable return on investment. Consumer demand acts as the main factor influencing the formation of the assortment, which, in turn, is aimed at maximizing and meeting the demand of the population. Demand parameters include:

- comparative competitive advantages (the product must have pronounced features or pronounced advantages in comparison with analogues existing on the market, products or services of competitors);

- social orientation (it is necessary that the product fits into the existing social conditions, so that the proposed product corresponds to the prevailing lifestyle and value system of the consumer);

- the ability to satisfy the consumer (the product must perform all functions to meet the key needs and requests of the buyer).

The nature and possibilities of mutual adjustment of supply and demand are determined by the ability of these factors of the market mechanism to influence the change in the price level of retail goods and commodity groups. The quantitative side of this relationship is expressed by the concept of price elasticity of supply and demand, which is understood as the degree of the corresponding response of supply and demand to a relative change in the level of market prices.

Increasing the competitiveness of manufactured children's clothing is possible only through the development of new models based on marketing information and in-depth study of the preferences of specific groups of buyers, accelerating the process of changing the assortment while maintaining or increasing the efficiency of the production system.

If an enterprise wants to operate successfully in the buyer's market, it must conduct business in such a way as not to depend on the sale of what it can produce, but to produce what it can sell at a profit. In these conditions, you need to manage an enterprise focusing on the market, not the product. At the center of this mindset is the customer, with their desires and expectations that must be met as fully as possible.

Today, a light industry enterprise striving not only to survive, but also to develop, requires the ability not only to competently exploit existing technologies, but first of all, to actively position itself on the market, supplying high-quality products that meet the requirements, requests and expectations of consumers in a short time. minimum price. In other words, at the present time, the one who will put on the market faster than others the products that most fully meet the requirements of consumers, while ensuring the minimum cost of its production, will “survive”. To do this, the company needs:

- understand both current and future preferences of customers and be able to develop types of products that match these preferences;

- to ensure the adjustment of technological production processes, which guarantees their minimum cost by identifying and eliminating all types of costs that do not bring value to the product;

- to bring your products to the market before competitors.

The implementation of the listed tasks will depend on how smoothly and efficiently all departments will work at the enterprise. This can be achieved through a quality management-based approach according to the international standard ISO 9000: 2015:

- definition of a set of processes or activities that ensure the production of products with quality characteristics that meet the requirements, requests and expectations of consumers;

- establishing clear and understandable interaction between processes;

- the definition of quality objectives at the level of the enterprise and departments, providing an understanding of the results to be achieved by departments, and which ensure the achievement of the overall objectives of the enterprise;

- planning the resources needed to achieve the goals;

- determination of procedures to ensure the execution of work in the departments in the most efficient way;

- measuring the results and comparing them with the set goals;

- analyzing and deciding what needs to be improved within each division.

The implementation of these actions will make it possible to form an enterprise management system that directs it to the production of products that meet the requirements, demands and expectations of consumers in terms of their characteristics and adjusts all types of activities related to production support to an efficiency indicator, providing:

- building a system for identifying sources of costs and developing adequate measures to reduce them;

- the formation of reliable data demonstrating the effectiveness of the use of invested investments, which can help to attract new investors;

- reducing the cost of production, which makes it possible to reduce the price, expand the market and increase the volume of production;

- reduction of costs associated mainly with a reduction in the number of rejects and other types of waste, which has a positive effect on such indicators of the enterprise as the impact on the environment, the state of industrial safety; the image of a socially oriented enterprise is formed;

- a clear statement of goals and objectives for each employee, defining the result that should be obtained when performing work;

- determining the resources needed to carry out the work and providing resources;

- providing the knowledge and skills necessary to understand how the work should be done in order to ensure its maximum efficiency;

- measuring the results of work at the level of employees, departments and the organization as a whole and comparing the results with goals;

- analysis of results and adequate response to them through a system of corrective and preventive actions.

As world practice shows, the ability to implement these processes at the level of top management creates the conditions necessary for the formation of a competitive enterprise, ensuring the economic stability of enterprises.

In recent years, researchers have noted a growing tendency for consumer preferences to change towards the quality, availability and safety of products for children, and even more recently, the main reference point for most buyers was price. Thus, one can judge the growth of the consumption culture along with the growth of the population's income, which naturally leads to an increase in demand for branded products as of higher quality in the eyes of parents.

Based on this, large manufacturers of children's clothing in the Southern Federal District and the North Caucasus Federal District should start developing lines of high-quality clothing in the more expensive segment under their own brand. The demand for such products will be stable, but so far - only in regional centers and other developed cities. This will be facilitated by the growing interest and confidence of consumers in domestic products from year to year, due to their compliance with much more stringent regulatory requirements for the manufacture of children's things and, as a result, higher quality compared to many imported goods, which are often extremely harmful to the health of children and not suitable for climatic conditions. For the same reasons, many Russian manufacturers compete more and more successfully with foreign and in the middle price segment.

Another argument in favor of the development of Russian brands is the stable development of modern civilized trade formats, where, as a rule, original products of a certain price category and quality level are sold. As mentioned above, the well-being of the population is growing, its culture of consumption, which in the near future will attract consumers precisely to comfortable shops, children's centers, etc., and not to open markets, fairs, etc. At the same time, an increase in the purchasing power of the population of the regions Against the background of saturation of the markets of the largest cities, we can talk about the future development of the entire market for children's goods, mainly due to regional markets.

Online commerce is gaining more and more popularity as a powerful and, most importantly, a consumer-friendly means of developing product recognition. The audience of Internet users and their confidence in this sales channel is growing, for many of them it is more convenient to buy things that do not require fitting (and it is difficult to make mistakes with children's sizes) on the Internet, which significantly saves time and money.

Many manufacturers, not wanting to depend on the conditions of retailers, go to create their own mono-branded retail chains that increase their own profitability. At the same time, the popularity of the development of such networks in the form of a franchise is growing, which, given sufficient brand awareness, is a mutually beneficial event for both the franchisor and the franchisee. In this case, the main advantage of the development of franchised stores of goods for children is the wide distribution of the brand with a certain minimization of risks and costs of opening stores. There is a reduction in costs, pooling of profits, organization of logistics, a single circle of professionals of different levels, as well as general advertising budgets.

Thus, there is an increase in market diversification: more and more non-specialized retail chains include in their assortment groups of goods for children. The struggle for the consumer is intensifying: loyalty programs are expanding, the segmentation of the assortment matrix in favor of popular products and, in parallel, the cheaper basic assortment is more often manifested, more attention is paid to the location and format of the store, and its marketing support. When developing the assortment, interior, choosing the color and equipment for the store, the interests of both children of different age groups and their parents are taken into account, preference is given to the harmonious design and decoration of the sales area, the organization of a special play area.

Experts point to a possible increase in the child population in the coming years or a slight decrease in growth. Priority segments where high growth of domestic production is likely include: clothing for newborns, functional and bedding, hosiery, knitwear,

and school uniforms. In market conditions, the interests of the seller and the buyer are directly opposite: one is characterized by the desire to make a profit, the other is to save on direct costs, but there is always a common point of contact in their relationship, called the quality of the goods. For a conscientious seller, especially if he represents the interests of the manufacturer, the quality of the goods determines his reputation in the market, while the buyer, naturally, is inclined to maximize the utility of the purchased goods, largely due to its quality. Thus, the quality of the goods is the core of the normal interaction between the seller and the buyer, imparting a trusting nature to their relationship and, guaranteeing, the mutual benefit of these relationships.

For manufacturers, the catchphrase: “The future, in which there is nothing to do without quality, has already arrived,” - in the best way reflects the importance of timely response to changes in market conditions and adequacy in the placement of accents within quality relations. Even large investments may not save an enterprise if it cannot ensure the competitiveness of its products, which are based on quality. It is quality that consumers prefer when choosing products; it is also one of the most important criteria for the functioning of an enterprise in a relatively saturated market.

The situation in the light industry goods market is characterized by the transfer of "power" into the hands of consumers. It is consumers who, by their choice, determine the "winners" in the intense competition.

The condition for the consumer to choose a product in a large assortment offered on the market is the coincidence of its technical parameters with the conditional characteristics of the predicted demand. From this point of view, the enterprise management strategy should be built on the principle of a "follow-up system" with feedback, that is, it should provide consumers with products that meet their specific requirements for quality and related service in its marketing, while constantly monitoring the degree of such satisfaction (Figure 7).

Tracking the quality of goods and related services consists of two stages:

1) studying, through marketing, consumer expectations as a product and a service for its promotion; based on this information, functional specifications for new types of products and quality of service are determined, which will depend on the ability to define customer expectations and the ability to adapt production technologies to changing customer expectations;

2) periodic "measurement" of the mismatch between the actual and expected level of product quality and related service; in accordance with the magnitude of the mismatch, the activities of the enterprise should be aimed at developing control actions on organizational and technological units in order to reduce the discrepancy and introduce new methods for assessing quality parameters.

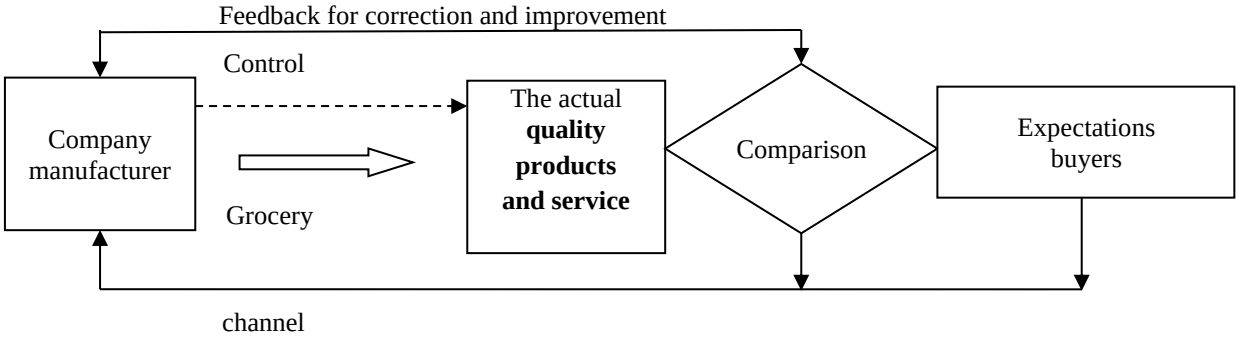


Figure 7. Customer satisfaction system

Quality assurance for children's clothing involves planning and conducting a series of measures to create conditions for the release of products that meet the requirements of consumers. When implementing these activities, the following are taken into account:

- factors influencing the formation of the quality of goods (study of the market for goods, development of requirements for goods, quality of raw materials and materials, quality of construction and design, quality of manufacture, quality of labeling of goods);

- factors that preserve the quality of goods (packaging, conditions of transportation and storage, sale and consumption (operation), technical assistance in service).

The chemical composition and structure of the initial substances and materials predetermine all the basic properties of goods, divided by nature into physical, chemical, mechanical, biological. Taking this factor into account, all the others are formed: design, technology, etc.

The starting materials are simple and complex substances characterized by constant chemical

composition and certain properties. The indicators of these properties are density, temperature constants, spectral characteristics, etc., which are the basis for the identification of goods and various types of expertise.

There is a certain functional relationship between the amount of an element or chemical compound and the measured physical quantity, which is used to directly characterize the consumer value of a material or product. The content limits for these substances are specified in the relevant regulations.

An important factor is the influence of the constituent parts of the starting substances, in particular the functional groups that make up the molecules of the starting substances, namely:

- the hydroxyl group (–OH) in the composition of cellulose fibers (cotton, flax) causes a high hygroscopicity of 8 - 12%, a good ability to color, the dependence of properties on moisture;

- carboxyl group (-COOH), amino group (-NH2) in the composition of protein fibers (wool, silk, leather) provide good hygroscopicity - 11 - 16%, good coloration, low electrification, the ability to form a network structure and, as a result, provide high elasticity of fibers;

- the amide group (–NH) in the composition of polyamide fibers (nylon, enant, anide) causes low hygroscopicity - 4%, weak dependence of properties on moisture, mediocre coloration, increased electrification;

- the ester group (–COO) in the composition of polyester (lavsan) and polyacrylonitrile (nitrone) fibers determines their zero hygroscopicity, poor coloring, high electrification.

Thus, knowledge of the chemical composition of the starting materials makes it possible to predict the nature of possible changes in finished products during storage and operation, as well as to identify the goods.

Design is one of the most important factors in the quality of finished products. The design is the shape, size, method of connection and interaction of parts and assemblies, the relationship between individual elements, interchangeability, multi-operation and other features of the product. The design of children's clothing should in the best way ensure functionality, ergonomics, aesthetics, reliability and safety in the use and operation of products.

Ergonomic properties- the ability of goods to create a feeling of convenience, comfort, the fullest satisfaction of needs in accordance with the anthropometric, physiological, psychological and psychological and physiological characteristics of the consumer. The ergonomic properties of children's clothing are subdivided into the following subgroups:

- anthropometric properties -the ability of goods during use to correspond to the greatest extent to the measurable characteristics of the child's body;

- physiological properties - the ability of goods to ensure the convenience of functioning of individual organs or parts of the human body when using them;

- hygienic properties are also associated with the influence on the living conditions of the human body and are subdivided into sorption (hygroscopicity, moisture yield), permeability properties (steam, water, dust, light, air permeability), electrification (accumulation of static electricity charges), heat-shielding properties (thermal conductivity, heat capacity);

- psychological properties - the ability of goods to provide the consumer with mental comfort during operation, to correspond to his individual perception of the goods, which is especially important for young children;

- psychological and physiological properties - the ability of goods to ensure compliance with the psychological and physiological capabilities and needs of the consumer, these properties comprehensively satisfy the psychological and physiological needs of a person, mainly characterized by organoleptic indicators.

Aesthetic properties are especially important for children's clothing.- the ability of a product to express social values in perceptible form features and satisfy aesthetic needs of a person: information expressiveness, rationality of form, integrity of composition, perfection of production performance and stability of presentation. Aesthetic needs are always individual, therefore, it is rather difficult to ensure the aesthetic properties of goods and evaluate them, but at the same time they are of considerable interest, especially when making clothes for children.

Indicators of the aesthetic properties of children's clothing are: appearance, compositional integrity, design, fashion, style, information expressiveness, production excellence, etc. Appearance is a complex indicator that includes shape, color, surface condition, sometimes integrity, as well as the presence of drawings and inscriptions. For the aesthetic perception of different children's clothing, the significance of the listed individual indicators of appearance is not the same and depends on the characteristics of the types of this clothing.

Integrity of the composition reflects the rational relationship of external signs with the internal structure and presupposes subordination to the main elements of secondary ones, the unity of the stylistic solution of all parts of the products.

Design is the ability of products to comprehensively satisfy aesthetic, ergonomic, social and other needs through their artistic design. The satisfaction of diverse needs and, first of all, aesthetic needs is achieved through a rational combination of indicators of appearance (shape, color, surface condition, etc.) with dimensions and indicators of functional and ergonomic properties. So, the beautiful shape of the products should be combined with ease

of use. The dimensions of the products as a whole or of their individual parts should ensure the harmony of form and functionality.

Compliance with a certain style allows you to meet social and aesthetic needs using a set of indicators of appearance, design features and details, which are determined by the general perception of the world for a particular segment of consumers. The style of goods, together with fashion, is an important means of creating the image of consumers and satisfying prestigious needs as a kind of social need.

Following fashion allows you to satisfy aesthetic needs, formed or developed in a certain socio-cultural environment for a certain, limited period.

The fundamental features characterizing these properties are single indicators of appearance:

the shape of the product as a whole and / or its individual parts;

color and / or color scheme (this is especially typical for clothes, shoes - the fashionable color of the season);

the condition of the surface, including design details (for example, the presence of ruffles on dresses, blouses, accessories on shoes, etc.);

the presence or absence of individual functional parts (for example, a heel on shoes, sleeves, belts on clothes).

The named indicators of fashion are ensured by selecting the most suitable types of raw materials and materials and developing a specific design.

Fashion is one of the important engines of scientific and technological progress, prompting fashion designers to create not only fashionable goods, but also to order the development of new materials and technologies.

The most important indicator of the quality of children's clothing is the safety of goods. Currently, in legislative acts, safety requirements are singled out in a special group as mandatory.

According to the Federal Law "On Technical Regulation", "the safety of products and related processes of production, operation, storage, transportation, sale and disposal is a condition in which there is no unacceptable risk associated with causing harm to the life or health of citizens, property of individuals or legal entities. persons, state or municipal property, environment, life or health of animals and plants ".

With regard to the quality of consumer goods, safety can be defined as the absence of an unacceptable risk to the life, health and property of consumers during the operation or consumption of goods. Unlike other consumer properties, the deterioration or loss of which leads to losses of functional or social purpose, non-compliance with the permissible level of safety indicators translates products into the category of hazardous, subject only to destruction - on the contrary, products that have lost other consumer properties are conditionally suitable and can be redesigned. In addition, the lost properties of products can be restored after appropriate elimination of defects, so that it can be used for its intended purpose.

On the territory of the Russian Federation, which is part of the Eurasian Economic Union, with regard to safety requirements for clothes for children, the technical regulations of the Customs Union TR CU 007/2011 "On the safety of products intended for children and adolescents" are in force in order to protect the life and health of children and adolescents, as well as warning of actions that mislead users of the products. Table 5 shows the biological and chemical safety requirements established in it for clothing made of textile materials for children over 1 year old.

Table 5. Safety requirements for clothing made of textile materials of the 1st and 2nd layers for children over 1 year old

Age group, user age	Hygroscopicity (percent, not less)	Air permeability (dm3 / m2s, not less)	Mass fraction of free formaldehyde (μg / g, no more)
1	2	3	4
1. Clothes of the 1st layer, bedding, shawls, hats (summer), swimwear and hosiery *			
Nursery group, from 1 to 3 years	9 (at least 7 is allowed for hosiery of occasional use)	150 (no less than 70 is allowed for products made of flannel, paper, lined (brushed) knitted fabrics)	twenty

Preschool group, from 3 to 7 years old	9 (at least 7 is allowed for hosiery of occasional use)	100 (at least 70 is allowed for products made of flannel, paper, lined (brushed) knitted fabrics)	75
School group, from 7 to 14 years old	9 (at least 7 is allowed for hosiery)	100 (at least 70 is allowed for products made of flannel, paper, lined (brushed) knitted fabrics)	75
Teenage group, from 14 to 18 years old	6 (at least 2 is allowed - for hosiery)	100 (at least 70 is allowed for products made of flannel, paper, lined (brushed) knitted fabrics, bed linen)	75
2. Clothes of the 2nd layer, gloves, mittens and hats, hosiery of the autumn-winter assortment *			
1	2	3	4
Nursery group from 1 to 3 years	8 (at least 6 is allowed for jerseys)	100 (at least 70 is allowed for products made of flannel, bumazey, lined (brushed) knitted fabrics, denim and corduroy fabrics and materials with polyurethane threads)	75
Preschool group, from 3 to 7 years old	8 (allowed: at least 6 for knitwear; at least 4 - for items of occasional use)	100 (at least 70 is allowed for products made of flannel, bumazey, lined (brushed) knitted fabrics, denim and corduroy fabrics and materials with polyurethane threads)	75
School group, from 7 to 14 years old	7 (at least 4 is allowed for jerseys and products of occasional use)	100 (at least 70 is allowed - for products made of flannel, bumazey, lined (brushed) knitted fabrics and materials with polyurethane threads; at least 50 - for denim and corduroy fabrics)	75
Teenage group, from 14 to 18 years old	4 (at least 2 is allowed - for jerseys and products of occasional use)	100 (at least 70 is allowed - for products made of flannel, bumazey, lined (brushed) knitted fabrics and materials with polyurethane threads; at least 50 - for denim and corduroy fabrics)	75
* Note - In swimwear, hygroscopicity is not determined, in hosiery - air permeability. ** Note - In mittens, gloves and headdresses, hygroscopicity and air permeability are not determined. *** Note - Tests are not carried out for the indicator of air permeability in products that, by design (sundresses, skirts, vests) or by the structure of the material (with loose weaving, openwork), imply high air permeability, as well as in products that have structural elements that ensure air exchange ...			

According to TR CU 007/2011, biological safety is a state of a product in which there is no unacceptable risk associated with harm to health or a threat to the user's life due to the inconsistency of microbiological, toxicological, physical and physicochemical properties with the established requirements; chemical safety - a condition of a product in which there is no unacceptable risk associated with harm to health or a threat to the user's life due to an excess of the concentration level of chemicals harmful to the user's health.

Compliance with chemical safety is especially important for clothing of the 1st layer, which is in direct contact with the skin, since hazardous substances entering the child's fragile body can cause serious harm to health: cause allergies, metabolic disorders, sleep, the appearance of disorders of the nervous and cardiovascular systems, pain and other

symptoms. Exceeding the MPC of toxic elements can cause poisoning of varying severity, sometimes even fatal.

Compliance of products for children and adolescents with TR CU 007/2011 is ensured by the fulfillment of its safety requirements directly or by the fulfillment of the requirements of documents in the field of standardization included in the List of documents in the field of standardization, as a result of which, on a voluntary basis, compliance with the requirements of this technical regulation is ensured.

Ensuring the competitiveness of children's clothing in the domestic market and its promotion in the foreign market is impossible without the production of high-quality products that meet safety requirements. Considering this, enterprises need to implement a quality management system (QMS), which should be systematically developed and supplemented over time. According to the concept of the ISO 9000: 2015 standard, the combination of its various elements contributes to the effective management of production and the release of quality products with minimal costs. This, in particular, is the philosophy of the TQM concept (Total Quality Management) and, as a consequence, the high efficiency of the quality system at the enterprise. In these conditions, the advantage will be given to the company that can offer consumers the best quality at a lower price.

The QMS should ensure both the conformity of the product to the requirements of the consumer, and the guaranteed identification and elimination of deficiencies in production processes that affect the quality, i.e. ensure the greatest likelihood of the absence of defects. The structure of the assortment of children's clothing is characterized by a significant variety in purpose, materials used, manufacturing technology, types, shape, cut, colors, finishes, etc., which is due to the peculiarities of the physical, psychological and physiological development of children in different age.

Children's clothing is classified according to various criteria. Classification according to the following age groups is common:

1) clothes for children of the infant group - from birth to 1 year;
2) nursery group - 1 - 3 years;
3) preschool group - 3 - 6 years old;
4) junior school group - 7 - 11 years old;
5) senior school group (teenagers) - 12 - 15 years old;
6) youth group - 16 - 17 years old. Other signs of the classification of children's clothing are shown in Figure 2.

Based on the results of the analysis of the previously listed features of the formation of an assortment of children's clothing for consumers in the regions of the Southern Federal District and the North Caucasus Federal District, we have prepared some recommendations for developing an optimal strategy for the release of a demanded and competitive assortment to revive the demand for the products of existing small or medium-sized enterprises, the number of which prevails in these regions , which cannot be said about the volume of their products in comparison with small-scale large-scale industries, with which they are not able to compete at the moment.

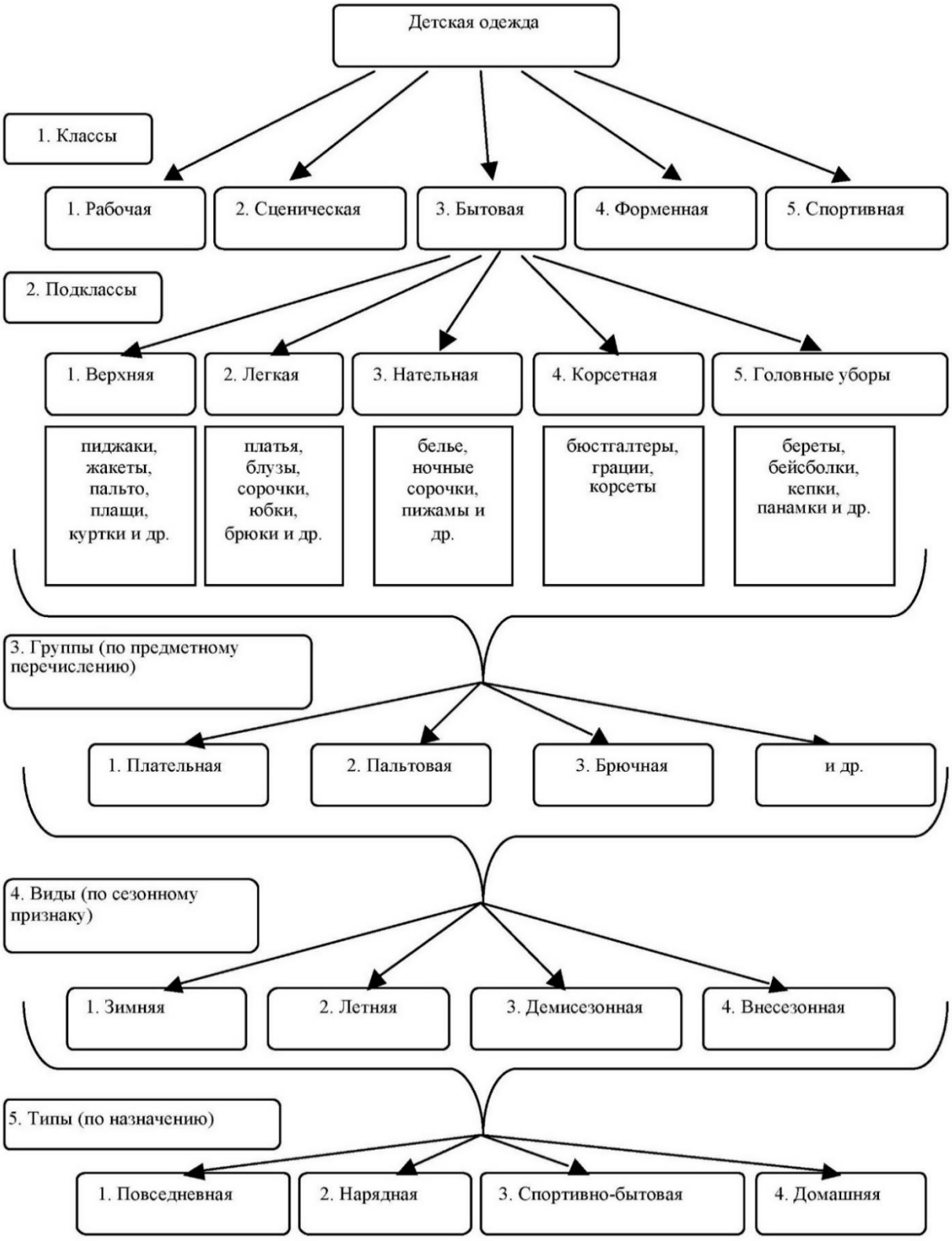


Figure 8 Classification of children's clothing

The climatic features of the two neighboring federal districts, the South and North Caucasus, are practically identical: for most of the year, these regions experience positive air temperatures with an average annual temperature of + 6.5 ° C. The mild climate determines the predominance of demand for the spring-autumn and summer assortment of clothing, which allows developing enterprises to orient themselves, first of all, to the production of lightweight clothing. Therefore, taking into account

the seasonality factor, as an example of an assortment in demand in this market, we will form an assortment of summer, light, everyday clothing for children of the preschool age group (as one of the most numerous groups, since there is an increase in the birth rate, and children grow up quickly), which is easy can be scaled and modified,

The task of studying the characteristics of consumer demand for children's clothing is the main one for improving the quality and competitiveness of products. First of all, it is necessary to establish by what criteria the buyer evaluates the quality, since he will try to purchase clothes with the most desirable set of properties for him.

To study the requirements for the quality of children's clothing, and the criteria that determine in the eyes of consumers the competitive position of children's clothing and its choice when purchasing, we conducted a survey of buyers living in the cities of the Rostov region. More than a hundred respondents (women aged 20 to 45) took part in the survey, the results of which are shown in Figure 3.

The most important criteria for the respondents when buying children's clothing are: convenience (23%), high quality (18.8%) and reasonable price (15.38%), followed by: appearance (11.96%), low price (9 , 4%), hygienic properties (6.84%), compliance with fashion trends (5.98%), firm prestige (3.52%), advertising (2.56%) and warranty period (2.56%).

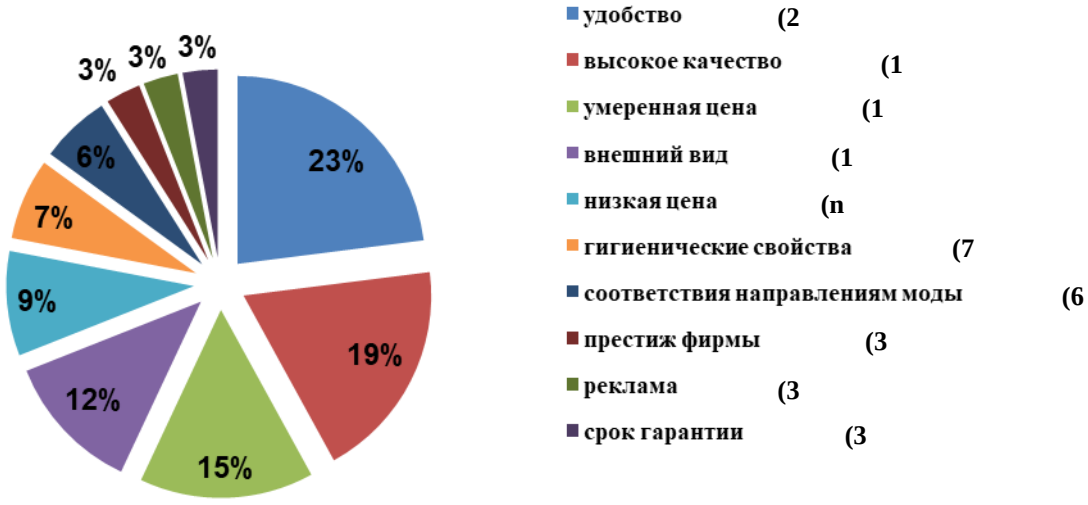


Figure 9. Criteria for the purchase of children's clothing

When developing or updating the assortment, enterprises should take into account not only their capabilities, but also the presence of similar competitors' products on the market, as well as the preferences and capabilities of buyers in certain market segments. Table 6 provides information on the number of registered manufacturers of clothing for adults and clothing for children in the regions of the Southern Federal District and the North Caucasus Federal District.

Table 6. Number of manufacturers of clothing for adults and children

Manufacturers	Clothing for adults	Clothes for kids
In the regions of the Southern Federal District:	50	29
Krasnodar region	17	12
Rostov region	22	11
Volgograd region	6	4
Republic of Crimea and the city of Sevastopol	4	2
Astrakhan region	-	-
Republic of Adygea	1	-
Republic of Kalmykia	-	-

In the regions of the North Caucasus Federal District:	38	14
The Republic of Dagestan	-	-
Stavropol region	35	10
Chechen Republic	-	-
Kabardino-Balkar Republic	1	2
Republic of North Ossetia - Alania	-	-
The Republic of Ingushetia	-	-
Karachay-Cherkess Republic	2	2

As can be seen from Table 6, there are significantly fewer manufacturers of children's clothing than adults in both districts, and their overall representation in this market, like the entire light industry, is not able to cover the growing demand for legal Russian products, which in the Southern Federal District is satisfied only by 18.5%. , and in the North Caucasus Federal District - only 10.1%. One of the serious problems of the industry, hindering its development, is the high number of unregistered "underground" workshops producing counterfeit products. Therefore, due to the strongly pronounced unfair competition, as well as the total predominance of imports for operating small and medium-sized enterprises in both districts, the main problem is the impossibility of producing competitive products that meet the needs of various social strata. After all, buyers differ from each other by a variety of parameters: according to their needs, financial and other capabilities, location, buying views and buying habits. In this sense, the South and North Caucasian Federal Districts are of the greatest interest for segmenting the market due to the homogeneity of the aggregate consumer who responds in the same way to the product and the methods of evaluating it for purchase.

It is also necessary to take into account the factor of purchasing power, on the basis of which one can focus on the ratio of consumer segments of a given market. Table 7 shows information on the average income per capita in the regions of the Southern Federal District and the North Caucasus Federal District in 2018 - 2020.

The data on incomes, presented in Table 7, make it possible to judge about their relatively low level relative to the all-Russian level for most regions of the Southern and North Caucasian Federal Districts. As a result of segmentation, it was also determined that the population of the two districts is unevenly distributed over the territory. When forming the assortment, one should pay attention to the high percentage of rural residents in the structure of the population - in aggregate in the Southern Federal District and the North Caucasus Federal District, it is equal to 42.5%. Taking into account the above survey results, one can judge the advisability of bringing products of the middle and medium-low price segment to these markets - especially for small and medium-sized businesses. However, in order to create demanded products, enterprises need not only expanding and updating the range,

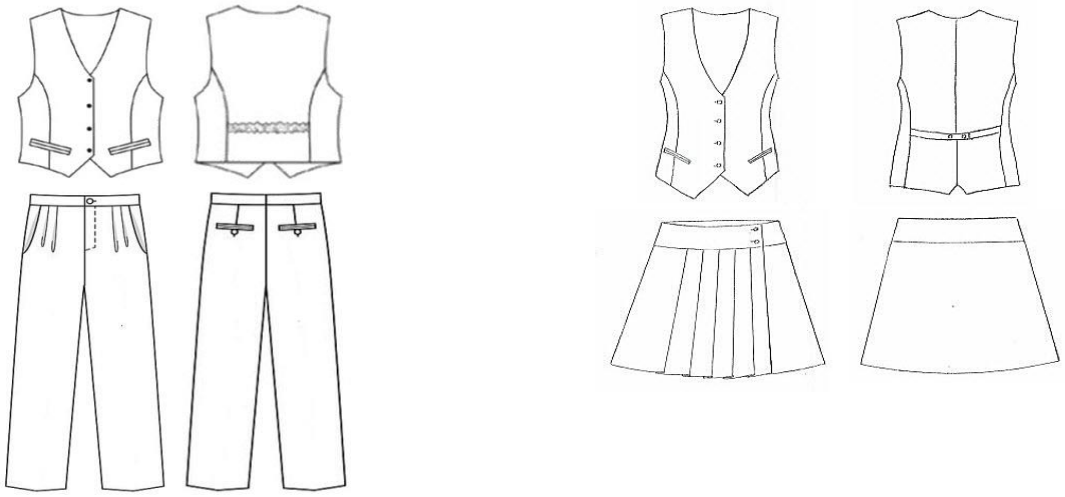
Table 7. Average per capita cash income for the subjects of the Southern Federal District and the North Caucasus Federal District

Territory	**year 2013**	**2018 year**	**2019 year**	**2020 year**
Russian Federation	25928	27767	30 467	30738
Southern Federal District:	21842	24 328	25459	26519
Republic of Adygea	18512	22,054	22646	23627
Republic of Kalmykia	11 311	12 398	14230	14758
Republic of Crimea	-	-	15,658	19,059
Krasnodar region	25777	28 788	31375	32672
Astrakhan region	19778	22169	24,057	22676
Volgograd region	17590	19,056	21719	21465
Rostov region	20995	23355	26558	27,228
Sevastopol	-	-	17882	22916
North Caucasian Federal District:	18,900	20693	23,024	23 399
The Republic of Dagestan	21717	23 423	26738	28348
The Republic of Ingushetia	13 821	14346	14,713	15 106
Kabardino-Balkar Republic	15297	16619	19 102	20487

Karachay-Cherkess Republic	14664	16 109	17268	16937
Republic of North Ossetia - Alania	17788	19 820	22,003	21964
Chechen Republic	17188	19 788	22917	22451
Stavropol region	19,768	21590	22969	22270

It is important to form an assortment policy for the manufacture of such an assortment of children's clothing in order to guarantee its demand and demand not only due to the pricing policy, but also to provide consumers with comfort and prevent the occurrence of diseases and other ailments associated with design flaws, improper selection of materials and components. Unfortunately, today filling the market with imported products does not ensure the elimination of these problems, which is one of the reasons for the need for an import substitution policy in order to meet the demand of consumers of these entities, namely, in such clothes that would satisfy them in all aspects, and allow manufacturing enterprises to receive stable technical and economic indicators with a guarantee of social protection of the population of these regions.

In summer in the Southern Federal District and the North Caucasus Federal District, rather hot, predominantly dry weather sets in. Although the average monthly air temperature of the warmest month in the year of July is + 23 ° C, often on many days in some places the temperature is set above 35 ° C and even above 40 ° C. Often, this weather is already established in May, it can last all September. Considering this, when developing an assortment, it is worth giving preference to open, light, loose, "breathable" clothes - this should be facilitated by the use of modern high-quality materials in its manufacture, the basis of which should be natural fibers (cotton, linen, nettle, hemp, etc.) with by adding the permitted proportion of artificial fibers, as it decreases, the cost of the product will increase, while satisfying the needs of different social groups. Figure 10 shows an assortment of clothing for children that meets the specified requirements: T-shirts for boys and girls, T-shirts for boys and sundresses for girls, shorts for boys and summer semi-overalls for girls. Saturation, brightness, multicolor emphasize traditions, taste, mood among consumers.



a *b*

Figure 10. Sketches of costumes: *a*- for boys; b - for girls

And the use of patchwork in the production of children's clothing, due to the use of waste materials, significantly reduces the cost of its production and expands the color gamut, which provides not only demand, but also a flexible price niche that guarantees its implementation to consumers with different social status. Patchwork clothes look beautiful, original and individual.

The body shape of boys and girls in infants and children of primary preschool age does not differ, therefore, for the development of small production, it is advisable to produce clothes of a universal style (unisex) for this category of children, or to vary colors and patterns for each model for girls and for boys, which will not require large labor costs. The silhouette can be free, wide, shapeless, and the shape can be rectangular, square or oval; set-in sleeves, raglan, cuffs are fastened with buttons, Velcro, zippers. Distinctive features indicating the gender of their owner may be completely absent.

Vests and trousers (skirts) for preschoolers are among the most promising types of children's clothing for production and sale on the territory of the Southern

Federal District and the North Caucasus Federal District.

In this type of clothing, you can best express a bright southern flavor, highlight little fashionistas against the background of their peers, gradually instilling good taste in clothes, the ability to look after their appearance, since very soon they will have to go to first grade, where they will have to spend many hours in school a form requiring some care in handling. After the resumption of the institute of school uniforms in Russia, it became clear that schools would become one of the largest customers of sewing enterprises, and while there are not very many of them in the Southern Federal District and especially in the North Caucasus Federal District, it is worth taking a moment to develop your small production, starting with sewing clothes for preschoolers, and after successful consolidation in the market and the gradual accumulation of competencies with the simultaneous development of production - to switch to the production of school uniforms, after all, parents will probably give preference in her choice to an already well-known company, from which, perhaps, they once purchased a suit for their child. Light industry is one of the industries for which the problem of adaptation in the face of fierce competition is especially urgent. The main direction of increasing the investment attractiveness of enterprises is their innovative development. The growth of investments in innovative development will allow introducing new progressive technologies into production, updating the manufactured products, mastering new sales markets and ensuring a constant increase in the profitability and market value of the enterprise. But at the same time, there should be opportunities for implementation. The intensification of investment activity, in turn, contributes to the growth of the economy, with the help of investments, new enterprises are created and, accordingly,

Improving the efficiency of innovation is the basis for building a competitive strategy for the development of light industry in Russia, ensuring the effective correspondence of production volumes, quality and range of products to the aggregate demand of consumers, increasing the national importance and image of the industry. This requires continuous scientific and technical development aimed at improving the processing technology of materials and semi-finished products to standardize the properties and reduce the resource intensity of light industry products, develop innovative systems for the design and design of light industry products, create innovative structures with improved consumer and economic properties, and optimize technological processes. due to the automation of production,

The innovative approach of enterprises is based primarily on internal resources, but for effective and long-term development it requires integration with financial, economic, research Russian and international structures. Possibilities of using innovative equipment for the production of popular and competitive clothing for children

In modern conditions of tough competition between domestic and foreign brands with a predominance of the latter, a wide spread of various forms of unfair competition against the background of the growing lag of technologies used in most Russian industries from the most advanced, progressive and successful production can be considered only such production that actively and dynamically responds to emerging tasks. ... The principle “to produce only what is needed, when needed, and as much as needed” requires the adaptation of enterprises to the conditions of production in small batches with frequent changes in the assortment, that is, to the conditions of many assortment small-scale production. The efficiency of the enterprise, and in many respects the ability to survive in the competition, depend on the ability in a short time and with minimal costs to reorganize to produce products in accordance with fluctuations in demand. The development and implementation of flexible production systems opens up great opportunities for this.

The technological and organizational flexibility of production systems determines the variable potential of enterprises, their ability to quickly and adequately respond to changes in market conditions and acts as a mechanism for optimizing the structure of the technological system in order to reduce the cost. Thus, the development of flexible technological processes for the production of children's clothing will ensure high efficiency with its many assortment production, which will entail a sharp increase in demand for these products by enterprises of the Southern Federal District and the North Caucasus Federal District.

The organization of a wide assortment production will make it possible to turn some subsidized regions of the Southern Federal District and the North Caucasus Federal District into self-sustaining ones, increasing the level of income of the population, will become a prerequisite for the creation of new jobs, will ensure the development of small business and support legal private entrepreneurship, and will also create the basis for getting out of the shadow of a significant part of the turnover of the real sector economy in order to form the regional budget, thus, the implementation of a set of measures to modernize Russian enterprises carries both economic and political and social effects.

The main stage in the development of small and medium-sized enterprises should be raising their technical level of production, ensuring the introduction of competitive innovative products, high technologies, replacing certain types of imported products with domestic ones, and subsequently entering the Russian and world markets. This requires measures for the modernization and reconstruction of

existing production facilities and the creation of new ones, strengthening of internal control and the introduction of modern quality management systems, in the long term - certification of products and the production facilities themselves, the development of a dealer and distribution network, an active marketing policy, expansion of the practice of innovative leasing schemes. activities.

The effectiveness of the use of flexible technological processes for the production of a frequently changing assortment of products in small volumes (including single items) is possible if universal multifunctional equipment and a higher level of qualification of workers are used.

Next, we will consider modern effective innovative means to ensure high-performance production of competitive clothing for children.

At the stage of product design and production preparation, an important role is played by the use of a computer-aided design (CAD) system, which significantly speeds up the process of creating fashionable and convenient clothing models and calculating production technological parameters based on the automation of complex technical and routine processes. Figure 11 shows an example of working in the CAD Gemini Pattern Editor.

CAD, as a rule, includes several modules: technical drawing, design, pattern gradation, pattern layout, automatic cutting. This system allows you to create, develop and implement new product models in a short time, increase labor productivity, and provide more precise control at all stages of production.

Together with CAD, automated spreading and cutting complexes are used.

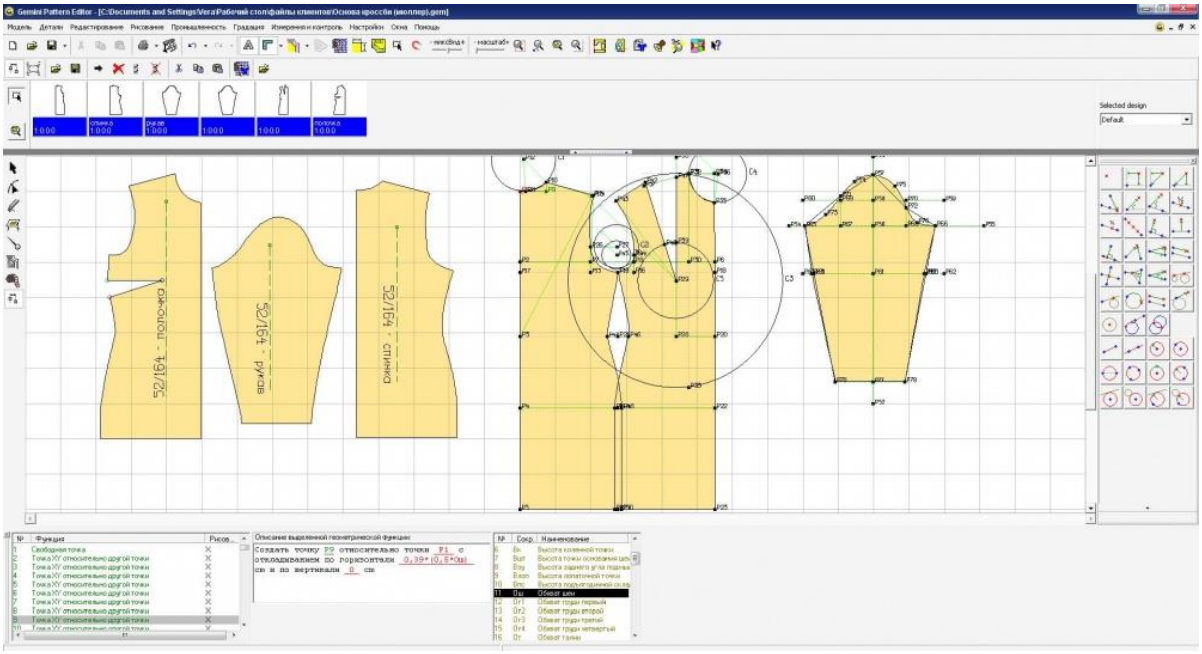


Figure 11. Window for creating patterns in CAD Gemini Pattern Editor

The automated spreader GERBER Synchron 51, shown in Figure 12, is designed for high-speed, non-tensioning fabric spreading with simultaneous edge leveling.

Model characteristics:
- lullaby feeding system;
- computer control;
- touch control device.

Figure 12. Spreading machine GERBER Synchron 51

The automated cutting complex GERBER GTxL, shown in Figure 13, is designed for high-speed precision cutting. Model characteristics:

- integrated vacuum system;
- the presence of a monitor displaying the layout during cutting, as well as the cutting sequence;
- displaying the parameters of the cutting system and control over them;
- conveyor cutting surface.

Figure 13. Cutting machine GERBER GTxL

For small businesses, a more profitable solution may be the use of combined cutting and spreading systems, such as the inexpensive semi-automatic equipment Rexel UL-3 (Figure 14).

Figure 14. Cutting and spreading machine Rexel UL-3

Cutting and spreading complexes are automatic and semi-automatic complexes of a new generation that facilitate and simplify the cutting process. Their use in sewing production leads to an increase in productivity due to a decrease in the time lost for aligning patterns when sewing, and they can be serviced by one operator who sets the indicated parameters and loads a roll of fabric, monitors the state of the process.

Table 8 shows the characteristics of the latest equipment, the use of which for sewing and wet-heat treatment of vests for girls of preschool age will allow, in the shortest possible time, to create high-quality unique products that are in demand on the markets of the Southern Federal District and the North Caucasus Federal District. Particular attention is paid to wet heat treatment, as one of the determining factors in giving the products anatomically correct shape during manufacturing.

Table 8. Equipment for sewing and wet-heat treatment of vests for girls

equipment identification	Characteristic
1	2
Back-up press Kannegiesser 	- the presence of a control panel with a device for self-diagnosis of duplication parameters and immediate reporting of deviations in the machine; - transporting system with a special anti-adhesive conveyor belt
Semiautomatic machine for stitching darts on the chest *PFAFF 3519-3-12* 	- allows you to perform a high-quality seam of stitching a dart due to the compaction of the stitches at the end of the seam; - the length and width of the dart, depending on the height and size, can be easily programmed; - due to the fact that a part of the front is positioned face up, when sewing a dart on striped and checkered fabrics, accurate alignment of the fabric pattern is ensured
DÜRKOPP 739-23-1 semiautomatic valve turning machine 	- allows you to create valve parts of various shapes, to keep up with fashion changes; - easily programmed using a personal computer; - the program is written to the TAGLOG chip and placed in the template; the machine reads information and does the job automatically; - high quality is created due to precise edge trimming and perfect fit
Semi-automatic side pocket making machine DÜRKOPP 745-34	- a double light element, which this machine is equipped with, recognizes the shape of the valve, the displacement of the seam, the position of the corner knives;

	- allows you to handle various types of pockets: in a frame with a valve, in a frame without a valve; - the machine ergonomically adjusts to the worker, leaving the working area free for viewing, thereby increasing quality and productivity
1	2
Universal stitching machine for basic seams *DÜRKOPP 275-140342* 	- equipping this machine with a puller allows you to make a high-quality seam in products from fabrics of various types and composition
Press for ironing Macpi leaves 	- the ironing press is equipped with leaf templates of different sizes; - the sides of the leaf are ironed, the line is squeezed out along which the part of the leaf is adjusted to a part of the front; - high productivity and accuracy of shape retention are the main advantages; - easily adjustable depending on the type of fabric being processed by changing the pressure and amount of steam, pressing time
Carousel press for molding parts of the front Macpi 	- allows you to easily create a given design form; - equipped with a computer, which allows you to change the pressing parameters depending on the composition and type of fabric
Bottom ironing press Macpi	- eliminates a number of manual manipulations: drawing a chalk line at the bottom, sweeping out the hem of the bottom, etc.; - high performance;

	- equipped with a computer that allows you to perform a high-quality technological operation in products from fabrics of different composition
1	2
Armhole Lining Sewing Machine *DÜRKOPP 697-15155* 	- the column structure provides the convenience of working on it; - equipped with a thread trimming and stitch relaxation device, which is activated when sewing through the shoulder pad; - it is possible to adjust the fit of both the upper and lower layers of fabric
Finishing Stitch Making Machine *AMF REECE 59/83* 	- high-quality finishing stitching, imitating decorative hand stitch, relevant in modern fashion; - easy adjustment of the stitch length; - various types of stitches: point, uniform, long / short
Equipped workstation for sewing on buttons *PFAFF 3307-3 / 01B* *PFAFF 3307-9 / 01C* 	- machines with electronic control for sewing on buttons with an offset top and a deviating needle bar; - simple programming of the seam on the control panel in Teach-in mode; - sewing on buttons on a leg, without a leg and a blind stitch with a tack on the hem; - free choice of leg wrapping operation
Macpi Wet Finishing Press	- simultaneous pressing of the right and left shelves; - equipped with a video computer;

	- software control; - high-performance; - equipped with a device for precise pressure and steaming

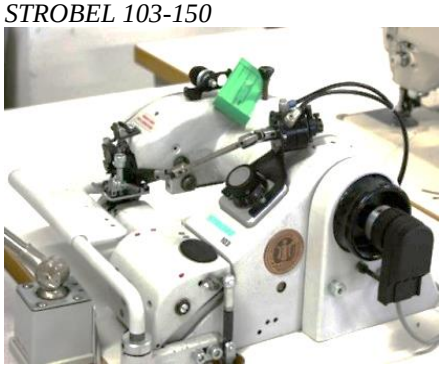
Table 9 shows the characteristics of high-tech equipment for the production of trousers for preschool boys.

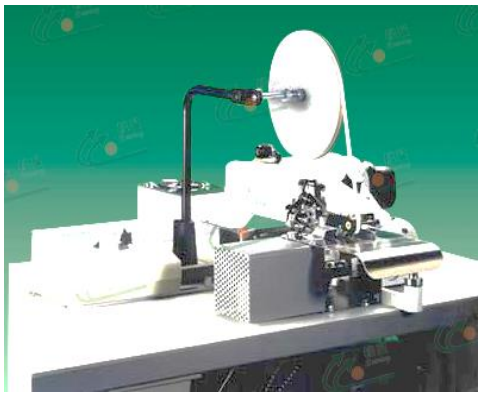
Table 9. Equipment for sewing trousers for boys

equipment identification	Characteristic
1	2
Automatic sewing machine for sewing darts and folds on the belt *DURKOPP 743-221* 	- stitching darts on the back of the trousers; - stitching of darts-folds on the front parts of the halves of the trousers; - precise, quick adjustment of various depths of darts and folds; - allows you to easily adapt the installation to different requirements
Semiautomatic machine for turning the toe of a belt of trousers *DURKOPP 739-23-1* 	- allows you to create details of the toe of a belt of various shapes, is easily programmed using a personal computer, the program is written on the TAGLOG chip and placed in the template, the machine reads the information and performs the work automatically; - high performance, high quality is created due to precision edge trimming and perfect fit
DURKOPP 1265-5 semiautomatic overcasting machine	- semiautomatic device for wrapping back and front parts of trousers; - allows you to make a partial fit on the lining; - programming for overcasting complex fabrics

	
Special machine for finishing stitching along the waist of trousers *DURKOPP 550-5-5-2* 	- specially for the operation of laying the finishing line on the waist of the trousers; - accurately and evenly processes the belt; - a large passage under the sewing foot; - an ergonomic tabletop provides free movement of hands when moving the workpiece
1	2
Special machine for grinding side and crotch seams *DURKOPP 550-8-2 / 0* 	- the upper and lower conveyors work absolutely synchronously, even at high speeds; - always smooth seams, edge fence facilitates positioning and advancement of the part, ensures first-class quality
Codpiece and Trouser Cutting Machine *DURKOPP 550-2*-1 	- smooth seams; - notch device; - specially for sewing a codpiece with a hem and sewing a cuff with a zipper, all operations are performed without additional re-equipment
Machine for sewing a bodice to a belt DURKOPP 550-5-6	- double chain stitch; - equipped with a corsage roll holder; - plate for inserting belts; - when processing right and left belts, there is no need for retooling

	
Codpiece Zipper Slotting Machine *DURKOPP 50-2-2* 	- Perfectly attaches an endless zipper to the trouser codpiece; - the equipment of the device guarantees adjustment of the zipper without displacement; - limit ruler controls the seam width
1	2
Semiautomatic machine for sewing on a trouser tape on the bottom of trousers *DURKOPP 1500 / 70-2* 	- two-needle, chain semiautomatic device; - the trouser tape is automatically guided, cut off at the end of the seam and then automatically pulled back to the beginning of the seam; - programming of the supply of the trouser tape
Semi-automatic for fastening belt loops and corners of trouser pockets *DURKOPP 510-211* 	- all bartacking works with the size of the sewing field, starting from 40 × 20 mm, used for 0.1 mm steps in length and width; - 50 pre-programmed standard bartacks; - when changing the presser foot, the possibility of curly bartacking at the corners of the pockets
Semi-automatic sewing machine for buttons DURKOPP 530-211	- double lockstitch; provides great opportunities for their application;

	- it is possible to process buttons with 2, 3, 4 and 6 holes and diameters from 8 to 30 mm; - the graphic display is serviced and works without any additional programmer
Machine for sewing labels PFAFF 2438-6 / 03-980 / 32 AS 	- automatic recognition of the label edge using a sensor; - 15 programs with 15 matching seam sections; - the ability to automatically adjust the touch control for various materials; - adjusting the stitch length using the BDF-S2 control panel
1	2
TYPICAL GC8000MD3 	- universal automated machine; - has the function of automatic thread trimming, bartack, thread catcher and stitch adjustment
STROBEL 103-150 	- machine for hemming trousers, blind stitch machine; - equally suitable for hemming light and medium-weight fabrics
One-thread blind stitch machine for making trouser loops STROBEL 103- 258 MB	- supply of the cushioning material by the belt conveyor together with the upper material; - a cutting device with a given belt loop width; - blind stitch; - ironing in a steam device; - belt loops without stitches visible from the outside.

	
Semi-automatic inner pocket AMF REECE LW-6000 	- production of pockets in a frame with a lining; - software control and graphic display; - electronic adjustments of speed, position of corner knives, central knife, parameters of the performed pocket

The introduction of high-tech equipment complexes at domestic enterprises on the basis of the above recommendations will make it possible to create a product that is competitive not only in the domestic market of the regions of the Southern Federal District and the North Caucasus Federal District, but also in other local markets, including foreign ones. And if the requirements of Roskachestvo for the localization of production are met, then when the products meet the increased requirements of the Russian quality system, it can be awarded the Russian Quality Mark. And product labeling with this sign opens up new opportunities for both consumers and manufacturers. The consumer receives a clear guideline, which speaks of the high quality of a particular product, as a result of which its sales grow, which will be beneficial to the manufacturer, increasing its import substitution potential, which also allows him to count on an inflow of investments. The use of natural materials as an important factor in increasing the competitiveness of manufacturers of children's clothing.

The second key direction of increasing the competitiveness of summer clothing for children is the use of materials in its production that provide maximum comfort and safety when wearing it. For an active child's body, these characteristics of summer clothes act as the most important ones, especially in hot weather - after all, fabrics of light clothes that are close to the skin must have high air and vapor permeability and good hygroscopicity in order not to impede removal from under the clothing space carbon dioxide, sweat and a number of other metabolic products released by the skin, and there should also be no release of unacceptable harmful substances from tissues.

For preschool children, it is permissible to use capro-viscose cloth and cloth from cotton-lavsan yarn with a nylon and lavsan content of no more than 40% in clothes, as well as cotton cloth in combination with a nylon textured elastic thread (no more than 23%).

However, the most suitable materials for the production of children's clothing with acceptable hygiene characteristics are natural products. Cotton and linen fabrics, as a rule, have good hygienic properties, which is also important for maintaining the mechanisms of heat regulation in children, since at this age they are still as formed as in adults, therefore children are more susceptible to overheating or hypothermia, which can lead to malfunctions in the work of the body, the development of certain diseases. In this regard, the most promising direction for improving the materials used is the use of organic materials.

Organic materials, or eco-materials (biomaterials), have become increasingly popular in

recent years. This is due to the fact that during their cultivation no chemical additives and carcinogenic pesticides are used, which is confirmed by the presence of laboratory test certificates.

The most common eco materials include cotton, linen and bamboo. Thus, organic cotton is even softer and provides maximum comfort due to its close to human Ph-factor. Moreover, this material has antibacterial properties, its air permeability is about 10% higher than usual, its fibers are stronger, which increases the wear resistance of the material. Organic linen is slightly less applicable in the manufacture of children's clothing due to its rigid structure. And the most common eco-friendly material has become bamboo, which has a number of such positive qualities as: silkiness, hypoallergenicity, high hygroscopicity, maintaining thermoregulation, and it also has antibacterial qualities and is very resistant to ultraviolet light, which is especially important in the summer season.

Another worthy representative of organic materials is ramie nettle fabric, which has a fairly high strength, several times higher than the strength of cotton. One of the aesthetic features of this fiber is its shine, which is not lost after washing or under the influence of the sun, but, on the contrary, becomes even more spectacular. Nettle is not prone to decay, which means that there is no need for serious chemical treatments, thereby classifying it as environmentally friendly fabrics. The fiber does not cause allergies and skin irritations, does not contain toxins, and does not use herbicides and pesticides during cultivation. The fiber perfectly absorbs moisture, while the body "breathes" freely. In hot weather, ramie clothing is especially relevant: the fiber allows you to maintain an optimal climate for clothing and protects the skin from various inflammations,

Hemp is one of the most ancient types of cultures used by man for the production of fabric due to its numerous positive properties: the most durable natural fiber, does not stretch, retains the original form of clothing, very soft textiles that become even softer over time, guaranteeing comfort and convenience of clothing, very high hygroscopicity and air permeability. Hemp fibers also have antibacterial and antifungal properties that naturally prevent rotting and the development of parasitic fungi, therefore, pesticides and herbicides are not used in the cultivation of hemp crops. The properties of hemp fibers have also been proven to reduce the effects of ultraviolet rays on the skin: the fabric is able to filter most of the UV spectrum.

A significant limitation in the use of organic fabrics in the manufacture of clothing for both children and adults is their high cost. That is why manufacturers seeking to conquer various price markets should rely on the exclusivity of such products, selling them to other large Russian regional markets, as well as abroad, which should have a positive effect on increasing the manufacturer's brand recognition. To reduce the cost of individual product lines, it is necessary to use blended fabrics containing both organic and conventional fibers. To bring the price even closer to the market average, you can also use fabrics with the addition of artificial fibers, which will also allow you to indicate “made with organic” on the clothing label.

Thus, organic materials have a significant set of useful properties that can positively affect the health of a child when wearing clothes made with their use. Indeed, against the background of the annual deterioration of the ecological situation, the use of synthetics of not the best quality in all household items around a person, including in clothes, it is no coincidence that a fashion for environmentally friendly products appeared: clothing, food, bedding, etc., and many parents strive to protect children from its harmful influence by purchasing products of so-called "eco brands", and someone is just an adherent of the concept of "being in trend". Therefore, the use of natural hypoallergenic materials in the production of children's clothing is characterized by high prospects for increasing the competitiveness of Russian industries.

The use of ecological technologies for the production of children's clothing guarantees the safety of its operation. Unfortunately, in pursuit of maximum profit, manufacturers often try to use cheap raw materials and materials, hiding defects behind a large number of finishing effects, thereby trying to sell bad goods in beautiful packaging. Modern technological methods make it possible to “change the face” of a bad material, but cannot improve its poor performance properties. In addition, in the production of some effects, very harsh chemicals are used that can harm the baby's skin. The ideology of Russian manufacturers of children's clothing should be based on the rule defining the requirement to select only the best raw materials for children's clothing, delicate and ecological processing methods,

An important parameter of the environmental friendliness of clothing is the use of modern anthropometric sizes of children in the development of the design. The use of outdated or foreign anthropometric data in the construction of patterns leads to an incorrect and uncomfortable fit of clothes on modern Russian children. Made in accordance with the current SanPiN 2.4.7 / 1.1.1286-03 "Hygienic requirements for clothing for children, adolescents and adults" labeling of products according to the main dimensional characteristics - chest girth and height, can guarantee the correct selection of clothing. Operating and newly created enterprises and firms in the South of Russia, using the proposed measures, will be able to produce competitive clothing for children in the required volume to meet the demand of various groups of the population with a certain level of income and social security.

Conclusion

The dynamics of market development invariably shows an increase in consumer demand for the quality of goods. For all the economic, social and political costs, humanity is getting richer and wealth is unevenly distributed. Finance, as before, is concentrated in certain regions, however, just like new modern production facilities. Analysts predict the course towards the quality of goods with confidence and everywhere: the mass consumer has realized the need to pay for the advantage of quality services and products. Economists state unequivocally that the improvement in the quality of goods is not causally related to the rise in prices. Positive changes in the quality of goods imply qualitative changes in technology, technology, organization and production management. Manufacturing should improve, but not become more costly.

The expansion of the market for domestic goods will help meet the effective demand of the population for various price groups of products, taking into account consumer preferences. However, the production of children's clothing is associated with a number of economic features that have a great impact on its organization. In conditions when the manufacture of children's clothing is scattered across many non-specialized enterprises and occupies a small share in production programs, the economic interest of garment factories in increasing its output is not always achieved, since the production of this assortment often does not ensure the fulfillment of the technical and economic indicators of the plan. The low level of specialization of production restrains the growth of the production of children's clothing and gives rise to duplication of homogeneous models and styles, limits the possibilities of rational, economical use of fabrics, which helps to reduce the cost and achieve the necessary profitability of the production of products for children. The conditions for reducing the cost of raw materials for the production of children's clothing, and at the same time for increasing labor productivity, are to a large extent achieved by the specialization of production and a more complete use of internal reserves.

To this end, the recommendations proposed above for updating the equipment of enterprises producing clothes for children in order to improve the technological process to increase its flexibility can also be applied at enterprises that sew men's clothing. The implementation of this proposal will significantly reduce the cost of creating a new production, eliminating the need for costs for the construction (rental) of buildings, providing all the necessary communications, hiring the necessary staff of performers, equipping new workshops, creating design and technological departments, state registration of a new production, etc. release of children's clothing in affordable price niches. The implementation of the planned transformations can be implemented using mechanisms of state support,

Leasing is a type of financial services, a form of lending for the acquisition of fixed assets by enterprises or goods of high value by individuals. The lessor undertakes to acquire ownership of the property specified by the lessee from the seller specified by him and to provide the lessee with this property for a fee for temporary possession and use. Most often, this is carried out for business purposes, but from January 1, 2022, this is not necessary in Russia. The lease agreement may stipulate that the choice of the seller and the acquired property is made by the lessor. The lessee may initially be the owner of the property.

Leasing allows the use of accelerated depreciation, it is possible to redistribute the timing of VAT payment. In fact, leasing is a type of long-term lease of property with subsequent purchase option, comparing favorably with a traditional bank loan. The bank begins the procedure for applying for a loan by considering the application, and most banks will certainly require the property that the company already has as collateral. In this case, the loan amount will depend on the value of this property. The bank assesses the property of the company not at the market value, but at the value for which it will be possible to sell the collateral in the shortest possible time. Accordingly, the value of the collateral will be greatly underestimated.

However, during leasing, the lessee receives the equipment it needs and begins to operate it, but at the same time it remains the property of the leasing company. At the same time, the lessee undertakes the obligation to gradually buy out the new property from the company, that is, it kind of leases the equipment. Therefore, in the case of leasing, no collateral or excellent credit reputation is required - the equipment purchased under the lease remains in the ownership of the lessor until the enterprise-lessee pays for it in full. In addition, unlike banks, which issue loans (especially to small businesses) for a period of about five years, leasing companies can significantly increase the term of payments. Depending on the purchase, companies allow themselves to expand the scope up to 10 years. Leasing also provides for the possibility of the lessee to use the property in carrying out entrepreneurial activities and subsequently obtain ownership of it. Leasing agreements may provide for the accounting of property both on the balance sheet of the lessor and the lessee. The buyer of equipment on credit has the ability to transfer the cost of the property to the cost price through depreciation, however, the interest on the loan, accrued after the receipt of the property, is not included in the cost of the property, therefore it cannot be transferred to the cost price.

Lessees, in the case of property accounting on the lessor's balance sheet, have the opportunity to include lease payments in the prime cost, which

ensures the transfer of the property value to the prime cost in a much shorter time compared to the purchase of equipment using borrowed funds. This option, in contrast to the purchase, also allows you to include in the prime cost interest on borrowed funds, which are included in the amount of the lease payment. The option of leasing, taking into account the property on the lessee's balance sheet, also makes it possible to transfer the cost of the equipment to the prime cost through depreciation in a shorter timeframe due to the use of a multiplying coefficient to the depreciation rates, and also to include in the prime cost interest expenses on borrowed funds.

The funds provided by the Industrial Development Fund at a preferential rate of 5% per annum make it possible to finance the necessary development and technological work, without which the production of innovative products is impossible. In addition, the fund mechanism hides a hitherto unused potential, because the allocated funds can be considered not only as a tool for purchasing equipment. These funds, in fact, can become an initial payment for leasing and other payments for the purchase of such equipment. Competent use of this mechanism will allow enterprises to increase the attracted funds by 5 - 8 times.

In the costs of the production of children's clothing, the largest share is made up of costs for raw materials and basic materials, and then for wages and depreciation deductions. The results of calculating the costs in the retail price of children's clothing are shown in Table 10.

In a dynamically changing market environment, the results of an enterprise's activities largely depend on the effective results of production, sales, financial and marketing policies of the enterprise itself, which creates the basis for protection against bankruptcy and a stable position in the domestic market.

The study of the costs of improvement by consumer quality factors for each type of designed product will reduce the risks of losses associated with consumer dissatisfaction, these costs should be taken into account by manufacturers when forming a new assortment.

Table 10. Share of costs in the retail price of children's clothing,%

Indicators	Minimum meaning	Maximum meaning	The average
Raw materials and basic materials minus recyclable waste, by-products and related products	14.2	36.6	23.1
The cost of the main raw material	8.1	32,7	19.2
Cost of other raw materials and basic materials	1,2	9.6	4.1
Returnable waste, by-products and related products (deducted)	0.01	1.4	0.3
Manufacturing costs including selling costs	15.7	30.9	24.3
Auxiliary materials for technological purposes	0.1	3.6	1.0
Fuel and energy, including water and steam for technological purposes	0,4	2.1	1.4
Preparation and development costs	0.01	0.3	0.1
Equipment maintenance and operating costs	0.1	2.8	0.8
Salary with social contributions	6.3	17.9	9.8
General business (plant-wide) expenses	1.5	10.4	5.2
General production (shop) costs	0.7	7.6	3.9
Other production costs	0.1	3.2	0.7
Business expenses	0.3	4.7	1.5
Total unit cost	9.9	56.2	44.3
Actual profit, loss	3.8	9.9	6.2
VAT	4.4	9.1	6.3
Other types of taxes	0.01	0.5	0.1
Payment for the delivery of products (goods) to customers, carried out by the enterprise	0.01	0.2	0.1

The general state of light industry in Russia, its structure, problems inherent in it as a result of the economic reform of the early 1990s and in the current difficult macroeconomic situation are characterized. The main directions of activity, in which the activity on the development of the industry is currently being carried out, in accordance with the adopted Strategy for the development of light industry in Russia, is considered. The geographic features of the regions of the Southern Federal District and the North Caucasus Federal District and the assessment of the number of children are given. The features influencing the formation of the range of children's clothing are analyzed. The principles of a competent assortment policy for the production of competitive children's clothing, taking into account the factors affecting its consumer demand, have been determined:

The requirements for children's clothing and determining its quality are analyzed, of which the most important are the safety requirements established by the technical regulations of the Customs Union TR CU 007/2011, as well as the requirements for materials, the chemical composition and structure of which determine all the basic properties of finished products, divided by nature into physical, chemical, mechanical, biological. Taking into account this factor, all the others are formed: design, technology, etc. Taking into account all kinds of requirements for clothing, it was noted that the production of clothing from natural organic materials is highly promising for increasing the competitiveness of Russian industries in different markets, due to their undoubtedly better hygienic properties.

The influence of innovative technologies on the development of the production of children's clothing has been investigated; recommendations for equipping sewing enterprises of the South with innovative equipment are given. The efficiency of enterprises, and in many respects their ability to survive in the competition, depends on the ability to quickly and with minimal costs reorganize to produce products in accordance with fluctuations in demand, the best opportunities for this are opened by the development and implementation of flexible production systems.The restructuring and technical re-equipment of modern small and medium-sized production of children's clothing, as well as manufacturers of men's clothing with high-performance multifunctional equipment should be facilitated by the widespread introduction of the practice of leasing schemes as the most optimal option for the development of Russian industries.

Thus, the transition of the industry to an innovative development model focused on increasing its competitive advantages, not only meets the vital needs of many regions of the Southern Federal District and the North Caucasus Federal District (reducing social tension, ensuring employment, developing small and medium-sized businesses), but also contributes to the formation of a prosperous, ecologically healthy environment of childhood that meets social needs to ensure a full life.

For the successful implementation of the proposed measures, a real interest in supporting the sewing enterprises of the South on the part of the federal and regional branches of government is necessary, which should lead to a decrease in prices for components, materials, energy costs and transport, providing the manufacturer with the opportunity, due to the price niche, to offer the domestic consumer a demanded and competitive baby clothes. This is able to provide many manufacturers with stable positions not only in domestic, but, which is especially important, in foreign markets.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 20.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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METHODS AND APPROACHES IN TEACHING ENGLISH AT A SECONDARY SCHOOL LEVEL

Abstract: *The study aims of the article describes popular methods and approaches to TEFL, their main features, development and current trends in language teaching. Attention is paid to secondary school pupil characteristics as well. This thesis is based on a questionnaire research towards English language teachers at secondary school level and what methods and approaches are currently being used in TEFL.*

Key words: *secondary school level, English language, method, approach, teaching.*

Language: *English*

Citation: Eshkaraev, E. (2021). Methods and Approaches in Teaching English at a Secondary School Level. *ISJ Theoretical & Applied Science, 12 (104),* 763-765.

Soi: http://s-o-i.org/1.1/TAS-12-104-77 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.77

Scopus ASCC: *1203.*

Introduction

The concepts of an approach, technique method are defined to avoid confusion because different authors of popular methodology literature define these terms differently. It contains chapter dealing with conditions of a choice of a suitable method and questions the role of teaching materials, their benefits for the teaching process as well as their disadvantages. The target group of learners in this thesis is the one of younger adolescents. Those are namely pupils of secondary schools since the research part of this work focuses on secondary school pupils. Schoolchildren aged about from six until nine attend primary schools. Primary schools directly continue in secondary schools with pupils from the age of ten till fifteen. In this case, the factor of age plays an important role in the decisions about what and how to teach in the class and therefore also the choice of teaching methods, procedures, and techniques. This age group of learners has a great disposition for learning. They are able to operate in abstract concepts, which is very important in terms of language learning as for example in understanding grammar rules or understanding abstract terms.

Pupils at the age of approximately ten and on are usually happy to work in groups in comparison to younger learners. They prefer working by themselves. The pedagogue then needs to acknowledge this type of inhibitions and work with them to make the learning process happen successfully. Teenagers are searching for their identity in the world and their own place as well as opinions. They long for peer approval and belonging into any group, where they can feel secure and accepted. When the teacher wants their pupils to be engaged, they need to present a topic in a way that is relevant to their pupils´ lives and authentic. It is always wise to show that the topics learnt at school are connected to their lives outside of the class, even better when it engages their hobbies and interests which lead to positive motivational belief.

Every approach is based on a different view on the nature of the language or different theory about the language and the way people learn and use it. Another aspect of differentiation among the approaches is the purpose of language learning and teaching, the objective. Whether it is for understanding and analyzing written texts, ability to communicate in the target language or to accomplish knowledge of other aspects of the taught language. Some of the approaches are contradictory, some evolve from the earlier ones, and others develop or improve older approaches.

The following list of approaches attempts to summarize the objective of an approach, short introduction to its development, role of the teacher and the pupil, arrangement of the four skills, attitude to

mistakes and accuracy, and procedures or techniques applied within the approach.

The Grammar-Translation approach gives out a perfect understanding of its main objective. The G-T approach implies methods, procedures, and techniques employing deductive attitude to grammar instruction and translation from target language to student´s first language and vice versa. Techniques used within this approach are for instance translation, grammar drills, and vocabulary memorization.

The basis of the Grammar-Translation approach reaches out as far as teaching Latin more than five hundred years ago. It was Latin back then that played the role of the international language of the communication, education, and religion in Europe. Latin language, however, lost its dominance in the sphere of communication and education and was substituted by modern languages like French or English later on. The approach to teaching those modern languages remained almost the same, though. "By the nineteenth century, this approach was based on the study of Latin had become the standard way of studying foreign languages in schools. A typical textbook in the mid-nineteenth century thus consisted of chapters of lessons organized around grammar points. Each grammar point was listed, rules on its use were explained, and it was illustrated by sample sentences" (Richards 1986: 3)

The main important objective of language learning within the Grammar-Translation approach is to learn language for the purposes of reading literature written in it and also to "benefit from the mental discipline and intellectual development that result from foreign-language study" (Richards, Rogers 1968: 4). The G-T approach approaches language learning through thorough analysis of its grammar rules. Understanding of those grammar rules is applied and practiced via translating texts or separate sentences from the target language into student´s mother tongue and the other way round. Firstly vocabulary is selected by the given sentences or texts and memorized through bilingual word lists in the target language that is equipped with their equivalent in the mother tongue of the language learners and followed by translation exercises. The main focus of the G-T approach is based on reading and writing skills with almost none or very little attention to speaking and listening. In other words, learners are to study vocabulary in the form of lists of isolated words and they practice them only via translation exercises.

Grammar is taught deductively where the teacher gives detailed explanations of the grammar in the mother tongue of the pupils with the main focus on the inflection of words, form, and parsing. Elaborate texts are introduced to learners and read and translated very early in the language instruction. Texts, however, only serve as examples of grammatical structures and material for translation without much regard to the context of the texts. Separate sentences are often used for drill exercises in translation from Tl into L1 and vice versa. Apart from rules about language instruction and techniques used, discipline plays an important role within this approach. Learners are supposed to develop their foreign language skills as required by the principles of the G-T approach and on top of it to develop their intellectual capacity.

The Grammar-Translation approach dominated foreign language teaching for more than hundred years from the 1840s to the 1940s (Richards, Rogers 1968: 4), and prevailed in language teaching for a very long time even after many newer views on language and teaching were introduced. The first distinctive and clearly organized reaction to the Grammar Translation approach was the Direct Approach.

The survey showed that most of the teachers are interested in learning about the new trends in TEFL methodology using various resources. Most teachers prefer to follow the resources on the Internet that helps them to improve their teaching. The teachers teaching in schools often attend training courses in order to keep up with the developing TEFL methodology.

The practical part of the dissertation was supposed to include a survey aimed at the pupils´ view on the methods and approaches used in the English language classes, too. This part of the research, however, was not carried out because I came to the conclusion that it would not offer a valid source of information for the subject matter of this dissertation project, since the thesis was focused on the teacher´s point of view. However, the pupil´s opinion on the current language teaching practice might be an interesting subject of further research.

The purpose of this paper was to point out the diversity of TEFL methodology and its constant development and changes, and to highlight the importance of the knowledge of TEFL methodology for the consciously developing teaching practice. Since there is no such thing as a universal method, every teacher develops their own way of teaching. It is not a stable frame, though. It develops with the teacher and adjusts to the individual needs of pupils. It is interdependent with the teaching materials and changes along with the TEFL methodology.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 20.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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DYNAMICS OF VOCABULARY CHANGE AND PROBLEMS OF LEXIC COMPETENCE DEVELOPMENT

Abstract: *In general, vocabulary can be defined as the ability of learners to understand, store, generate and use language in all areas of communication, namely speaking, listening, reading and writing. As linguists, we know that languages do not exist apart from the people who use them, and because people and their environment are constantly changing, their language also changes. This is the vocabulary in which the changes are most noticeable, because every year hundreds of neologisms appear in the language, and we are faced with the problem of recognizing and integrating them into our vocabulary. Many of them are technical terms related to new areas of knowledge that we now know something about, or they are borrowed from other languages, but each year we find ourselves using a few words and phrases that we have never used before. This phenomenon should lead to new priorities, projects and programs in language teaching and, consequently, in language learning.*

Key words: *vocabulary, neologisms, term, lexical competence.*

Language: *Russian*

Citation: Rasulova, Z. H., & Shamuratova, M. Sh. (2021). Dynamics of vocabulary change and problems of lexic competence development. *ISJ Theoretical & Applied Science, 12 (104),* 766-769.

Soi: http://s-o-i.org/1.1/TAS-12-104-78 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2021.12.104.78

Scopus ASCC: *1203.*

ДИНАМИКА ИЗМЕНЕНИЯ СЛОВАРНОГО ЗАПАСА И ПРОБЛЕМЫ РАЗВИТИЯ ЛЕКСИЧЕСКОЙ КОМПЕТЕНТНОСТИ

Аннотация: *В целом словарный запас можно определить как способность учащихся понимать, хранить, генерировать и использовать язык во всех сферах общения, а именно в разговорной речи, аудировании, чтении и письме. Как лингвисты мы знаем, что языков не существует отдельно от людей, которые их используют, и, поскольку люди и их окружение постоянно меняются, их язык тоже меняется. Это словарный запас, в котором изменения наиболее заметны, потому что каждый год в языке появляются сотни неологизмов, и мы сталкиваемся с проблемой их распознавания и интеграции в наш словарный запас. Многие из них представляют собой технические термины, связанные с новыми областями знаний, о которых мы теперь что-то знали, или они заимствованы из других языков, но каждый год мы обнаруживаем, что используем несколько слов и фраз, которые никогда раньше не использовали. Это явление должно привести к новым приоритетам, проектам и программам в преподавании языков, а, следовательно, и в изучении языков.*

Ключевые слова: *словарный запас, неологизмы, термин, лексическая компетентность.*

Введение

Когда мы думаем о лексике, мы в первую очередь думаем о словах. И это в целом выглядит правильным, потому что словарный запас действительно включает слова. Но это слишком упрощенное мнение. Словарь состоит из такого множества и столь разнообразных языковых элементов, что его изучение - это далеко не просто запоминание слов и их использование в различных тематических или ситуативных средах [2. 24 p]. Быстрый просмотр интернет-сайтов, посвященных изучению словарного запаса, демонстрирует широкий спектр мнений и подходов к роли словарных знаний в изучении языка - с крайней точки зрения, что основная цель - «передавать идеи», независимо от того, какие слова или грамматика или произношения, которое вы используете, с учетом того, что чем более сложен словарный запас, тем глубже ваши языковые навыки и лингвистическое понимание и тем выше ваш профессиональный престиж.

Как учитель английского языка я придерживаюсь последнего аргумента. Я твердо верю, что без продуктивных словарных знаний очень мало можно передать и усвоить. Более того, я считаю, что причины появления современных областей лингвистических исследований, таких как лингвопрагматика, лингвокультурология и когнитивная лингвистика, включают признание неуловимости и суверенности интерпретируемости словарного поведения в различных дискурсах, в отличие от более или менее жестких грамматических и фонетических закономерностей. Считается, что одним из ключевых показателей наших успехов в школе, университетах, в исследованиях и даже в жизни является наш словарный запас, и «причина этого просто в том, что знания по теме основаны на словарном запасе.»(Sprenger 2013).

Важность изучения лексики была заново открыта с появлением когнитивной лингвистики [3. 89 p]. Этот все еще развивающийся подход сам по себе является результатом междисциплинарных контактов между лингвистами и психологами, которые оказались чрезвычайно плодотворными в когнитивной интерпретации процесса изучения языка. Достаточно упомянуть подход CALP (Cognitive Academic Language Proficiency), который привел к разделению учебного процесса на аспекты аудирования, говорения, чтения и письма материала содержания предметной области. Овладение академическим языком - это не просто понимание лексики предметной области. Он включает в себя лексические навыки, такие как идентификация, сравнение, классификация, дифференциация, сборка, синтез, оценка, вывод и многие другие. Следовательно, словарный запас - это далеко не просто «слова». Словарь может быть определен как сумма языковых единиц, включая значимые фрагменты слов, названные морфемами, свободные формы слов, названные лексемами, и структурно и семантически неразделимые группы слов, названные стабильными фразами, с использованием только одного из лингвистического набора терминов для описания соответствующие языковые элементы, составляющие лексикон. Систематическое изучение словарного запаса - это область лексикологии, которая по праву является неотъемлемой частью программ профессионального изучения языка в этой стране [4].

Набор слов - это не просто список отдельных элементов. На занятиях по лексике необходимо научить студентов находить обобщения и закономерности и особенно учитывать отношения между элементами. Учителя должны заниматься систематическим анализом лексических единиц, парадигм и структур слов, а не простым скоплением слов, и восстанавливать основы теории слова и основных правил и положений, связанных с английскими словарными единицами [5. 71 p].

Общенациональный образовательный стандарт для изучения, преподавания и оценки иностранных языков определил множество лингвистических компетенций в соответствии с требованиями CEFR для уровня C1, что является долгожданной целью наших выпускников бакалавриата, ожидая от наших изучающих язык понимать широкий спектр длинных текстов и распознавать скрытый смысл: свободно и спонтанно выражать идеи, не ища явных выражений; гибко и эффективно использовать язык в социальных, академических и профессиональных целях; создавать четкий, хорошо структурированный, подробный текст по сложной тематике, демонстрирующий контролируемое использование организационных структур, соединителей и связных устройств [6].

Совершенно очевидно, что эти компетенции никогда не могут быть достигнуты без глубокого словарного запаса, который стоит в Государственных стандартах для «лексических компетенций». Морфологическая и семантическая классификация слов, типы словообразования, характеристики заимствованных и родных слов, использование идиоматической лексики и правил словообразования, международные слова, богатый индивидуальный лексикон - это лишь некоторые требования к языковому знанию студентов EFL.

Мы согласны с утверждением Л.Бауэра о том, что «словарь - это слова - откуда они берутся, как они меняются, как они соотносятся друг с другом и как мы используем их, чтобы смотреть

на мир» (Bauer 1998). Это был принцип, лежащий в основе курса современной лексикологии английского языка, который включает в себя фундаментальные теоретические знания о составе словарного запаса английского языка и направлен на развитие лингвистических компетенций и практических навыков, необходимых для профессионального обучения языкам.

Текущий курс «Английского языка» направлен на то, чтобы дать студентам возможность понять и интерпретировать магию Слова, его роль в создании и расширении словарного запаса, что включает понимание структурных, семантических, словообразовательных и фразеологических аспекты лексики английского языка, этимологическая характеристика языка, его роль в творческой силе и межкультурной значимости, лингвистическая и коммуникативная уместность семантической классификации лексики в языковой деятельности. Практические занятия по лексикологическому анализу лексических единиц и литературных отрывков направлены на развитие их социально-лингвистических компетенций, языковой интуиции и обогащение их профессионального лингвистического и коммуникативного тезауруса.

Анализ словарного запаса предусматривает преемственность всех ранее изученных лингвистических знаний, включая фонетику, грамматику, историю английского языка и т. д., и помогает учащимся понять связи между теориями языка и реальностью живой речи, с одной стороны, и с другой стороны, процессы изучения и преподавания языка, имея в виду, что большинство студентов EFL являются будущими учителями английского языка [7. 235 p].

Экстралингвистическая реальность, а также социальные и культурные явления больше не могут быть отделены от лингвистической науки. Прагматическая информация включается в словарный запас, поскольку важность анализа дискурса при исследовании словарного запаса широко признана в современной педагогике языкового обучения. Неотъемлемая ответственность преподавателя языка заключается в том, чтобы опираться на результаты лингвистических исследований внутренних и внешних аспектов нормативного поведения языка и его динамических изменений [8. 46 p].

Обобщая вышесказанное, мы подчеркиваем, что лексическое усвоение необходимо рассматривать в широком смысле и включать в себя структурную, синтаксическую и семантическую информацию о лексических единицах. Учащиеся должны уметь анализировать языковую единицу с разных сторон: значение, структура, смысловые отношения (синонимы, антонимы, гипонимы, словосочетания и т. д.), чтобы овладеть использованием слов в восприимчивой и продуктивной лексике на основе полного понимания их значение слова. Для достижения вышеуказанных целей существует множество стратегий: построение собственных определений, применение повторных формулировок и кластеризация слов, семантическое отображение и запоминание фрагментов слов, обучение словосочетанию, идиомам и пословицам, переработка лексических элементов (создание контекстов для повторного использования слова в различных функциях и деривационные формы), и, наконец, что не менее важно, ведение словарного журнала для записи лексических элементов, с которыми учащиеся сталкиваются в процессе обучения.

Эффективные современные стратегии преподавания и изучения лексики должны иметь лингвистические и контекстуальные измерения и динамику, включенные в процесс изучения языка учащимися. Учителя должны стремиться к развитию динамического взгляда на языковые изменения, которые являются частью социолингвистической реальности. Лексикологический анализ словарного запаса предоставляет им инструменты для понимания и принятия языкового развития и изменений, а также повышает осведомленность учащихся о рецептах и вариациях словарного запаса, чтобы успешно справляться с глобальным миром английского языка.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 20.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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FEATURES OF THE USE OF INFORMATION TECHNOLOGY IN TEACHING FOREIGN LANGUAGES

Abstract: *The usage of information and communication technologies in teaching foreign languages has accelerated dramatically in the system of education in recent years. It goes without saying that technology-aided direction has an essential role to contribute high quality of teaching skills. Technology is an influential tool for both teachers and students from which they obtain more profit. It is self-evident that our century is the era of technology. That is why today's atmosphere requires from teachers to be aware of information and communication technologies and they need to know how to assimilate it into their teaching process. In addition the way of teaching foreign languages with modern technologies has many effectual strategies in the learning course.*

Key words: *information technology, education system, technological direction, educational process, effective strategies in the curriculum.*

Language: *English*

Citation: Shadieva, Sh. S. (2021). Features of the use of information technology in teaching foreign languages. *ISJ Theoretical & Applied Science, 12 (104),* 770-772.

Soi: http://s-o-i.org/1.1/TAS-12-104-79 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2021.12.104.79

Scopus ASCC: *1203.*

Introduction

Students can learn the target language with the help of information and communication technologies without any difficulties. Learners get better opportunity to amend their target language skills when teaching is supplied with technology. As a result students can be motivated to succeed better because of technology-based teaching and learning surroundings.

Smart boards, computers, smart phones, screens and etc. are facilitating opportunities to learn foreign languages. Smart boards are helpful instruments in the class [1. 54 p]. For example, students can be taught to pronounce correctly and fluently with easily utilizing of native speaker's voice with the help of smart boards.

This article discusses the features of information and communication technology (ICT) as one of the good advantages in a study environment and also presents effects of technology-based instruction as the main system of today. However, we should pay attention to teaching and learning as social processes and it is a communication between teacher and students, thus technology makes learning process easier, but does not change this social operation.

Teachers should integrate technology in their lessons. Consequence variety of technological materials offer a lot of benefits. It is not great surprise that utilizing technology in teaching styles has positive results in teaching and learning target language. It is time that institutions should supplement traditional teaching with the use of technology [2. 128 p]. Undoubtedly, technology is considered as a part of everyday life nowadays and humans especially young generation are good at using information and communication technologies. Teaching by traditional strategies and methods is not enjoyable. On the other hand technology can make lessons much more interesting because interactive lessons bring effective results.

In our today's world new generation grows with technology. The great extent used technological device is smart phone. It is a helper for students and teachers to improve listening, reading skills. Moreover, students can watch and listen foreign language videos or speeches, as a result they improve their target language progress.

Experienced teachers make a natural atmosphere

for learners during the lesson. Most teachers account before lessons what they are going to teach and what kind of activities they can do in their lessons [3. 77 p]. In order to provide the lesson effectively they make the plan of the lesson and find resources to use. In this condition technological devices are the best thing to make some useful activities and they enhance teacher's lessons. For instance, teachers make activities on computer and can show students on the smart board or screen. This process is interesting and enjoyable for students and it is the best method learning foreign languages with any kind of activities. It helps to understand and remember the theme easily. Activities help students to learn new words and technology has an important role in methods of teaching [4. 195 p]. Learners can achieve success with undivided motivation with the help of integrating technology to language teaching. Integration can consist of games. Games suggest a lot of benefits to students but we should not forget that too many games are not a good way of teaching. To investigate and integrate the studies with technology-aided instruction is the aim to develop language skills. Nowadays there are computers and the Internet in every studying area. Information and communication technology is the best assistant to the teachers, it can answer the questions "what to teach", "when to teach", "how to teach" and how to integrate all their plans to the agenda.

Computer based teaching methods have already occupied a significant role in teaching foreign languages [5]. We should admit that technology considerably enhance teaching and learning foreign languages. Technology can include all kinds of tools of computers in the classroom. There are many tools that we can use during the lesson like: projector, presentations, videos, conference tools, interactive books, online dictionaries, e-books, interactive boards, learning foreign language websites, video games.

When different kinds of technologies first created people had to think how to use them or present the information with the help of copy machine, computer, screen or how to use tape recorder and others. However, nowadays teachers should find the way how to access information and transform it with technology. Today it is obvious that teaching environment demands change active learning into interactive one by sharing ideas, collaborating with others and creating videos. In today's developed world it is important to remember that textbooks are not sufficient any more to teach foreign languages, teachers need organize alive process and provide supplemental resources [6. 16 p]. We can reach this by creating visual pictures, changing dialogs, making games, quizzes, slideshows and supplementing the lesson with online games, songs, flashcards, videos and etc.

In the past traditional way of teaching was only based on transmission of knowledge. However, it is no longer sufficient today and society of nowadays requires learners to be able to face a great number of complex situations. Therefore, introducing technology to the studying process is also the best tool to consider the goal of the student. Information and communication technology integrated in every sphere of our life and every job, thus educators and teachers must find a balance between using technology and interpersonal skills.

It has been suggested that it takes a lot of time and hard work to master a language and it is seen that there is not enough time in class, because time is limited, therefore language teachers should give information to students about how to access information and knowledge in order to become autonomous learners. For example, teachers need to explain what is good and available in the Internet to learn foreign languages, provide online materials and create online environment. In the Internet learners can communicate with native speakers. It is the best way to improve their speaking skills [7].

Information and communication technology influence in teaching and learning with some features such as interactivity, communicability, speed, adaptability. Technology makes possible actions and interactions notably quickly. It provides communicating in the classroom and beyond the classroom too. One of the big advantages of information and communication technology is interactivity that considering interactive computer resources and applications.

With the assist of technologies, teachers show students video and audio materials according to target culture. In addition, in order to fascinate and involve students in the class using technologies students can communicate with each other easily in target language, collaborating and interacting with course material in variety of methods.

People have always learned something hand in hand with other humans and technology may balance connection between teacher and learner in the education system. Therefore, the role of teacher is indisputable significant. Nevertheless, technology itself is not the essential way as we value it. If there are not enough computers for every student in the classroom, teacher can record a video with topics and they transform or share to their flashcards and watch them at home. Student can also share presentations, project works, assignments with teacher and peers. Thus, we can create teaching and learning environment and organize it more interactive not only in the class even outside the class too [8. 228 p]. However, no doubt that interactivity can also be made by using simple black board and chalk. Class discussions and debates are also lively and natural process while teaching and learning foreign languages, such activities improve and increase students' outlooks and knowledge. Word competitions or role plays are also positive activities

that can impact students. Therefore, teachers need to create more effective ways of teaching in order to enhance students' knowledge. They should make sure technology is the assistant tool in achieving good results and educational goals.

The usage of videos in foreign language teaching is important nowadays. There are a lot of videos in the internet that teachers can show their students during the classes. Using videos in the classroom helps to increase level of interest and motivation [9. 322 p]. After watching video students might discuss and talk about what they watch and they can do different activities according to the video. The video is visual as well as audio material too. Because it gives an opportunity to students to hear and see the target language. They observe and learn native speakers' speeches, intonation and expression and they try to understand the context. Teachers can present video in the classroom and may give making interviews or some tasks related to video. In that case, student watch the video at home again and try to understand and make their own speech in the target language. The video helps to enrich the learning as useful tool, but we should remember technology delivers content. We make sure with the aid of technology someone can achieve good results if they work hard constantly [10. 47 p].

Technology, teachers and learners are connected phrases to each other in todays' world. For sure, we cannot refuse good teaching methods and practices by increasing the number of skillful teachers and at the same time we should admit revolution of educational system integrated with information and communication technologies. Teachers and learners should develop and build technology-based atmosphere during educational process. Technology-aided instruction contribute markedly to teaching and learning and leads to achievement effectively. It is generally believed that integrating technology into language teaching aids learners to improve their knowledge and encourages achieving better results. In the final part, I would like to say that information and communication technology is most important aspect and plays essential part in our everyday life. Among the educational community, utilizing these kind of technologies has risen rapidly. It has already been considered to integrate technology in teaching and learning foreign languages as the best and effective way because it provides many beneficial strategies in the learning process. Technology helps to organize lessons more interactive and interesting as well as to learn target language easily. Learners can take a better chance to improve their language skills when lessons integrated with technology.

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Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 9.035	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 21.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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CHARACTERISTICS OF THE CERAMIC MOSAIC OF THE TEMURID PERIOD

Abstract: *This article discusses the peculiarities of the decoration of the mausoleum of Gori Amir and Bibihanim mosque, which are the architectural monuments of the Timurid period.*

Key words: *art, period, decoration, mausoleum, architectural, monument, ceramics.*

Language: *Russian*

Citation: Jabborov, A. J. (2021). Characteristics of the ceramic mosaic of the Temurid period. *ISJ Theoretical & Applied Science, 12 (104),* 773-777.

Soi: http://s-o-i.org/1.1/TAS-12-104-80 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.80

Scopus ASCC: *1200.*

ХАРАКТЕРИСТИКИ КЕРАМИЧЕСКОЙ МОЗАИКИ ТЕМУРИДСКОГО ПЕРИОДА

Аннотация: *В данной статье рассматриваются характеристика керамичаской мозаики мавзолея Гори Амира и мечети Бибиханим, являющихся памятниками архитектуры периода Тимуридов.*

Ключевые слова: *искусство, период, украшение, мавзолей, архитектура, памятник, керамика.*

Введение

Особенность архитектурного убранства периода Тимуридов состоит в том, что искусство средневековой архитектуры в самом начале переживало свой расцвет. Возникла и развивалась новая подлинно аристократическая архитектура - искусство строительства роскошных и красивых зданий. В области настенной росписи, декоративно-прикладного искусства сформировался ряд новых традиций. В частности, большие и сложные архитектурные комплексы, впервые появившиеся в архитектуре, стали играть важную роль в градостроительстве. Были пересмотрены традиционные архитектурные формы и стили. Особенно большое художественное и эстетическое значение приобрело обогащение архитектурных памятников цветной плиткой. Конечно, красочное оформление также было неотъемлемой частью традиционной среднеазиатской архитектуры. Но к XIV веку этот стиль стал занимать особое место в интерьере и особенно в экстерьере здания. Масштабное воплощение красочных узоров из загадочной керамической плитки, резного загадочного узора, которое начало распространяться в конце четырнадцатого века, было большим достижением творческого мышления народов Ближнего Востока. Впервые эти изменения в архитектуре Средней Азии были замечены в мавзолее госпожи Турабек в Старом Ургенче. Эти замечательные монументальные традиции, созданные хорезмскими мастерами, впоследствии по приказу Тимура широко использовались и в других частях Самаркандского царства. И к этой работе привлекаются хорезмские мастера.

Materials and Methods

В конце XIV - начале XV веков в Самарканде велись особенно масштабные строительные работы. Город был окружен толстой стеной. В него вошли через шесть ворот. В высокой арке города были построены высокий Бостонский дворец, Голубые дворцы. В этот период мечети, медресе и мавзолеи, построенные из обожженного кирпича и украшенные синей плиткой, и

небоскребы-башни открыли в красоте природы особое очарование и изящество. В период правления Тимура строительство дворцов и парков в городе и за рубежом получило широкое распространение. Темур построил ряд роскошных зданий не только в своем родном городе Кеш и столице Самарканде, но и в других городах своей страны. Об этом свидетельствует тот факт, что он построил мечеть в Тебризе, дворец в Шерозе, медресе в Багдаде и мавзолей в Туркестане.

Архитектура периода Тимуридов дополнительно обогатилась новыми приемами декора, то есть обрезной плиткой. Мавзолеи были построены из двух, с внешним и внутренним куполом, и высоким цилиндрическим барабаном. Архитектурные украшения периода Тимуридов прославились своей оригинальностью. Технология украшения памятников архитектуры требовала большого мастерства и денег. Среди видов декора, широко использовавшихся в то время, были архитектурная керамика и монументальная живопись, а также резьба по дереву и камню.

Архитектурная керамика памятника состояла в основном из обожженного уксусом кирпича, узорчатой заклепки, рельефной глазурованной плитки, резной терракоты и иногда узорчатой мозаики. Можно заметить, что архитектурная керамика широко использовалась и развивалась в архитектурных памятниках, построенных в первые годы правления Тимуридов. Техника его выполнения усложнялась и совершенствовалась подбором более эффективных средств. Рельефная мозаика на загадочных плиточных плитах была внедрена в кирпичную мозаику, загадочную резную терракоту, которые были распространены до XVI века.

До Тимуридов в архитектуре использовалось несколько типов заклепок. Среди них можно выделить 3 типа самых распространенных. Вот они:

1. Заклепка сделана на яркой элегантной керамической плитке с большим количеством песочной смеси. Цвета немного размытые. Помимо черного использовались бирюзовый и белый цвета.

2. Некоторые цвета, например красный и белый, полученные в виде контуров, придаются обожженной стороне керамической пластины. К секретам в нем также добавлен зеленый цвет, но краска тусклая, потому что она не такая чистая и прозрачная.

3. Хотя первоначальный вид немного грубоват, он добавляет более широкий спектр секретов и олицетворяет чистоту и ясность. Керамическая плитка бывает разных цветов - от желтого до красного, и отличается исключительной прочностью. В период Тимуридов эта техника клепки вытеснила другие разновидности, используя золотистую воду на белом и охристом фоне, а затем приготовила их на огне. Эта техника изготовления заклепок вытеснила другие разновидности.

Во времена правления Тимуридов использовалось два типа рельефной терракоты - резные и набивные цветы. Это можно увидеть в прямоугольных колоннах Оксарой в Шахрисабзе.

До и после Тимуридов украшение и узор в архитектуре Мовараунахра и Хорасана не так сильно возросли. В архитектуре периода Тимура и Улугбека в убранстве наблюдалось разнообразие цветов и узоров.

В то время таинственная терракота с рельефом была преимущественно в 2-х цветах: по краям камня - бирюзовый, в центре композиции - желтый. Резной контур - контурный. Первоначально изделие запекают, помещая его в форму. Покрыта глазурью, повторно запечена.

Мозаика в основном состоит из плоской плитки. Камни заклепок намного легче. Увеличилось количество мелкозернистого песка и уменьшился состав почвы.

Камни покрыты краской. Цветную глазурь готовят путем смешивания солей (оксидов) свинца и других металлов для получения желаемого исходного цвета краски. Выпекать на слабом огне и не слишком высокой температуре.

Процесс вышивки чрезвычайно трудоемок, элементы мозаики из качественного гипса размещаются по контуру фотографии лицевой стороной. При их соединении не должно быть абсолютно никаких швов. После того, как рисунок состава набран, его задняя часть обклеивается гипсовой смесью, которая не отстает от самого современного цемента.

Во времена Тимуридов элементы мозаики были искусно выполнены. В центре маленьким цветочкам и листочкам придают другой цвет для небольшой лунки. Их изготавливали на крыше мастера на специальном оборудовании. Но до нас это не дошло.

Мозаика постепенно заменяется архитектурным декором. Ощущается влияние западно-иранской школы керамики. В государстве Амира Темура строители владели искусством декорирования красочной рельефной архитектурной керамики самых разных цветов. Стены полностью покрыты узорным орнаментом. Наряду с вышитой мозаикой этого периода развивались и исламские орнаменты. Поскольку секреты архитектурной керамики были чистыми и ясными, холодные цвета были гармоничными, а теплые - яркими. Большое внимание также уделяется эпиграфии в узоре мозаики. Эпиграфия иногда охватывала небольшую площадь, а иногда и большую площадь. Он содержит стихи из Корана, примеры хадисов, мудрые слова и описания правителя.

При Тимуридах были развиты все виды искусства, в том числе декоративные узоры. В этот период в светском искусстве существовала тенденция к отмене исламских запретов. Снова ожили насыщенные событиями узоры. Он процветал не только в миниатюрном, но и в монументальном искусстве. На стенах дворцов, отреставрированных по приказу Тимура, изображены свадьбы, обряды, образ эмира, принцессы и их родственников, войны и городские сражения, прием правителей, знати и ученых.

Согласно средневековым авторам, обсерватория Улугбека также имела живописные пейзажи, изображающие девять слоев неба и семь слоев земли, неподвижные планеты, горы, моря, пустыни и т.д. Главной задачей изобразительного искусства этого периода было прославление силы, красоты и грации правителя. Некоторые произведения изобразительного искусства, изображающие природный ландшафт этого периода, сохранились в интерьере памятников Самарканда (Ширинбека ага, Туман ага, Бибиханым) и Шахрисабза (Гумбази Сайидон).

В каждом виде народного искусства используются узоры, которые имеют уникальную структуру, внешний вид и значение. В XV веке появляется повседневное искусство узора. Он вылеплен красной глиной на специальной глине. Низ окрашен в темно-синий цвет, узор покрыт тонким слоем золота, а узор нанесен поверх золота. Таким же образом были изготовлены исторические памятники XV века в Самарканде: Ишратхана, Оксарой и другие мавзолеи. К XVI и XVII векам тематических росписей практически не существовало. Вместо этого был разработан кундальский метод орнаментальной композиции (мечеть Баланд в Бухаре, медресе Ходжа Зайниддина Адулазизхан (XVII век), медресе Тиллакори в Самарканде (XVII век) и другие.

Лучшие средневековые постройки страны служат настоящим образцом гармонии живописи и декоративного искусства, гармонии узоров в архитектурном облике построек. Каждая композиция представляет собой самостоятельное произведение по размеру и форме, и к концу семнадцатого века искусство росписи пришло в упадок. Об этом свидетельствует отсутствие яркой творческой проработки при работе над украшениями, укладывание помещений в определенный узор, единообразие тематики узоров и чрезмерное использование золота. Лишь в XVIII- XIX веках узбекские ханства стали в некоторой степени экономически сбалансированными. Был общий процесс развития культурной жизни, в том числе и искусства узора.

Во времена правления Темура и Улугбека интерьер здания также был разнообразным. Стены и потолок, даже купол украшены узорами. В зданиях, построенных во время правления Тимура, преобладали синий и золотой, с роскошными узорами, а во время правления Улугбека китайский фарфор украшали голубыми узорами на белом фоне. В этот период было построено множество религиозных построек, дворцов правителей, дворянских резиденций. После похода Тимура в Индию (1139 г.) в Самарканде была построена мечеть. Перед ним Бибиханым построил медресе и мавзолей. Улугбек начал расширение и реконструкцию Бухарской Пятничной мечети, но она была завершена в XVI веке.

В период правления Амира Темура и Улугбека изобразительное искусство развивалось разнонаправленно. Отсутствие поклонения изображению живых существ в исламе привело к развитию этого рисунка в изобразительном искусстве. В Средней Азии росписи и изобразительное искусство в целом, прекратившие свое существование в арабский период, были восстановлены по форме и содержанию во время правления Амира Темура. Ошибки - неотъемлемая часть рукописной литературы. Искусство миниатюры рассматривалось в первую очередь как узор. Фрески, отреставрированные в период Тимуридов, снова остановились в XV веке. Во дворцах и поселениях Темуридов в Самарканде были фрески с изображением приемов, сражений, сцен охоты и национальных праздников. На этих росписях отражены изображения сыновей и внуков, жен и наложниц Тимура. Еще во времена Улугбека росписи были красочными по тематике и стилистически близкими к жанру миниатюр.

Созвездие Андромеды изображено в образе женщины-чачлик в копии астрономического сочинения Абдурахмана ас-Суфи (10 век), которое было переписано в этот период. Самаркандская обсерватория отображает девять небесных тел, семь сторон, семь звездных огней, градусы времени и семь климатов Земли. Наряду с памятниками Ширинбека ака, Бибиханым, Туман ака, построенными во времена правления Тимура, были живопись и каллиграфия. В мавзолее Ширинбека ака изображение многоцветное, остальные внутренние стены представляют собой бело-голубые пейзажи.

Мечеть Бибиханым - один из самых величественных архитектурных памятников Самарканда, построенная в 1399–1405 годах по указу Амира Темура в честь Бибиханима (первоначально Сароймулк ханум), старшей жены Амира Темура. 11 мая 1399 года, как только Амир Темур вернулся из индийского похода, началось строительство. В те времена известные строители и мастера были привезены из Азербайджана, Хорасана, Индии и других стран. По этой причине имена мастеров и архитекторов, построивших

мечеть, неизвестны. Внутренний двор мечети имеет размеры 63,8x76,0 м и с четырех сторон окружен арками и крышами. Его общая площадь составляет 167x109 м, с высокими башнями по углам. Постепенно разрушенная и разрушенная землетрясениями, сохранилась только нижняя часть северо-западной башни высотой 18,2 м. Фундамент из гравия, стены толщиной 4,5 м из жженого кирпича. Сохранились 6 взаимосвязанных архитектурных частей мечети. Это здание с алтарем и высокой крышей во дворе, его уменьшенные копии с обеих сторон, разрезная крыша мечети внизу и минарет с северо-западной стороны. Раньше эти части объединяли с 3 рядами белых мраморных колонн, легкими арочными навесами, а поверх них располагались 400 куполов. Шаг колонн - 3,5 м, размещено 480. Основание резное, туловище резное, верх украшен мукарнами. Сегодня они закопаны в землю, и в результате археологических раскопок была обнаружена надбровная дуга колонны мукарнас, состоящая из колонн, постаментов и чаш.

По обе стороны двора четырехэтажные ворота с внешними воротами. Двор мечети вымощен мраморными плитами. В центре двора находится огромная мраморная плита (специальный стул для чтения Корана), которая изначально стояла внутри главного здания (она была перенесена в середину двора в 1875 году из-за страха обрушения большого купола.). Тарелка, украшенная изящными бордюрами, мукарнами, растительными мотивами и надписями, была изготовлена в середине XV века по указу внука Амира Темура Улугбека. Он гласит: «Великий султан, благородный хан, покровитель религии, хранитель ханафитской школы, благородный султан, ибн-султан, эмир верующего Улугбека Корагона». Верхняя часть крыши у входа в мечеть обрушилась во время землетрясения 1897 года (остальная часть имела высоту 33 м и ширину 46 м). Крыша величественна с аркой шириной 18,8 м посередине. Башни по бокам высоко над крышей. С внутренней стороны крыши - второе крыльцо поменьше. Ворота были резные, обрамленные мрамором. Надпись на нем гласит год постройки мечети и дерева Амира Темура (во время землетрясения 1897 года обрушилась большая крыша).

Двухслойные ворота изготовлены из семи различных металлических сплавов - «семь джуш» (позже исчезли). На боковых крыльях крыши располагались две винтовые лестницы. По лестнице Кунгура поднялся на арочную площадку, с которой пошел на башню. Широкая поверхность крыши украшена блестящей черепицей, красочными щитковидными узорами (сейчас черепица отвалилась, сохранившаяся часть крыши потрескалась и отделилась от стены). Главное (алтарное) здание мечети дает полное представление об архитектурном стиле времен Амира Темура. Заявление Шарафиддина Али Язди «Если бы не купол неба, купол мечети был бы уникальным в мире», не напрасно. Главное здание имеет крышу спереди, крыльцо в центре и две многоугольные башни по углам. Помещение за крышей состоит из набора простых, но величественных форм ручной работы (кубическая призма, пьедестал, приходящийся на восьмиугольную часть комнаты, и купол). Кубическая призма является основным размером здания со сторонами 14,6 м. Сверху - восьмиугольная призма, состоящая из арок, идущих вдоль стен комнаты. На круглом основании купола прикреплен постамент. Поверхность купола покрыта стихами из Корана, а сверху покрыт куполом, украшенным бирюзовой плиткой (сохранилась определенная часть). Его входные стороны также покрыты цветной черепицей, как и главная крыша, керамический кирпич уложен ровно, цветной глазурованный кирпич уложен вертикально.

Основные формы узоров собраны из прозрачных, ложувардских кирпичей, ряд которых заполнен синими кирпичами, белыми камнями. Простые изделия ручной работы и замысловатые надписи, такие как плющ, являются неотъемлемой частью декора здания. Уровень телебашен алтарного корпуса разделен на квадраты с 4 углами. Фигуры украшали фигурки в форме рук и исламские узоры (разных цветов). Они выполнены в стиле кафель. Поверхность кровельной стены покрыта поперечной черепицей. Каждый кусок плитки, цветоносы, чашки, стебли, бутоны и листья вырезаются отдельно от куска специальной шлифованной плитки. Керамика ставится на одной линии, не оставляя зазоров. Эти плитки (особенно синие) сияют, как прозрачное стекло. В убранстве внутреннего убранства мечети наряду с декоративным орнаментом широко использовались тисненые золотые узоры. Многогранные звезды в мечети, трехэтажные таблички с надписью украшены небольшими мукарнами, а границы выложены белым камнем.

Conclusion

Хотя два небольших здания рядом с мечетью в основном представляют собой небольшие копии алтарной комнаты, они отличаются простотой узоров и тусклостью купола. В 1868 году, когда Российская империя осадила Самарканд, мечеть Бибиханум была разрушена артиллерийским огнем. Несмотря на то, что мечеть находится в руинах, архитектурные формы мечети всегда привлекали внимание своей элегантностью и изяществом украшений. Цветные узоры на нем свидетельствуют об тонком вкусе и высоком мастерстве народных мастеров того времени. В

заключение следует отметить уникальность архитектурных орнаментов периода Тимуридов.

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 21.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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SYNTESIS OF A NEW DERIVATIVE OF COLCHAMINE AND AMINOCOLCHAMIN WITH PROPARGYL ESTER OF ACRYLIC

Abstract: *A method is proposed for the synthesis of a new derivative of aminocolchamine with methylethylenethylcarbinol and the synthesized compound is identified on 4- (aminocolchamino N / 1,1-methylethylbutin-2) carbinol by thin-layer and paper chromatography. The structures of the synthesized colchamine derivative are confirmed by the data of IR and PMR spectra. Based on the obtained data of IR spectra, it was found that the synthesized substance differs from the starting compounds from the ester and carbonyl groups.*

Key words: *aminocolchamine, propargyl, methylethylethynylcarbinol, 4- (aminocolchamino N / 1,1-methylethylbutin-2) carbinol.*

Language: *English*

Citation: Alikulov, R. V., Safarov, A. M., Haitov, B. T., & Atamuradova, D. M. (2021). Syntesis of a new derivative of colchamine and aminocolchamin with propargyl ester of acrylic. *ISJ Theoretical & Applied Science, 12 (104),* 778-781.

Soi: http://s-o-i.org/1.1/TAS-12-104-81 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.81

Scopus ASCC: *1600.*

Introduction

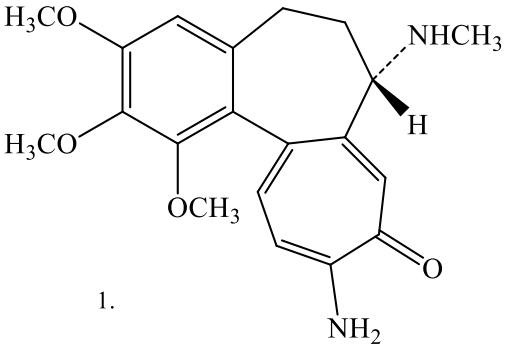
Colchamine is one of the alkaloids isolated from the corms of the Colchicum marius (Colchicum SpeciosumStev.), Fam. Liliaceae (Liliaceae). The second alkaloid contained in these corms is colchamine (Colchicinum). Both alkaloids have similar pharmacological properties, while colchamine is less toxic (7-8 times). Both drugs have anti-mitotic (anti-cell division) activity, have a karyoclastic (anti-cell division) effect, and inhibit leuko- and lymphopoiesis (the formation of white blood cells and lymphocytes).

Among the numerous chemical compounds with antitumor activity, much attention is paid to tropolonlilium alkaloids. In order to find less toxic compounds in this series, a large number of derivatives of colchicine and colchamine were synthesized.

It is known that the introduction of acetylene bond groups into the drug molecule significantly reduces their toxicity. Due to the fact that such work in the field of colchicine alkaloids has not previously been carried out, we synthesized derivatives of

aminocolchamine (1) with methylethylethynylcarbinol (2) [1].

Starting compounds for the synthesis of acetylene derivatives of aminocolchamine.



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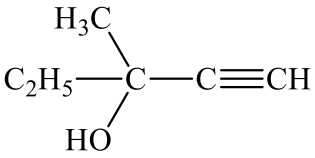


2.

The condensation reaction of aminocolchamine with acetylene compounds was carried out according to Mannich [2], in equimolecular ratios of the reagents:

The main starting compound, colchamine (1), was synthesized from the Colchicum luteum baker in the Surkhandarinsky region for the syntheses.

As a result, we synthesized; 4-(aminocolchamino N / 1,1-methylethylbutin-2) carbinol (3) [3].

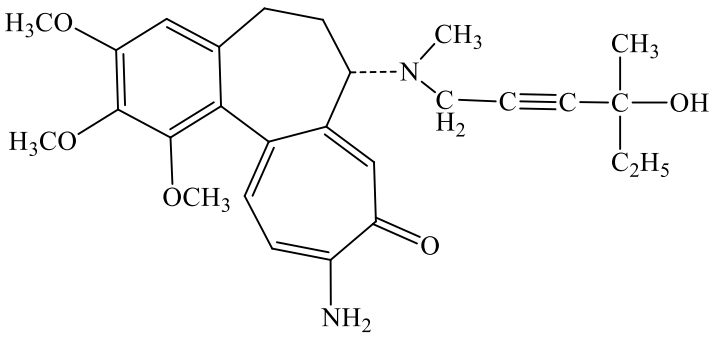
The compounds obtained are light yellow powders with R_f values close to each other. At the same time, they differ greatly in chromatographic mobility from the original aminocolchamine, having a high R_f value.

A characteristic feature of all acetylene derivatives is the presence of a two-proton doublet from the bridging N-CH_2 group in their NMR spectra, which appears in the region of 3.32-3.38 ppm. The bridge OCH_3 group present in compounds 4-5 forms a narrow two-proton doublet in the region of 4.53-4.70 ppm.

The structures of the synthesized compounds are confirmed by the data of IR and PMR spectra. The IR spectra of compounds with an ester moiety (3-4) show absorption bands of the carbonyl group (1735-1730 cm^1).

The colchamin fragments of the synthesized compounds in the 1H-NMR spectra do not differ significantly: the signals of the N-methyl group appear at 2.20-2.22 ppm, the methoxy groups at 3.56-3.60 (at C-1) and 3.82 -3.85 ppm (at C-2, C-3 C-10), proton H-4 - at 6.44-6.51 ppm, H-8 - 7.90-7.96 ppm, H- 11 - 6.68-6.75 ppm. and H-12 - 7.17-7.22 ppm.

Synthesized Acetylene Derivatives



The experimental part. Acetylene alcohols and amino alcohols and their various derivatives exhibit biological and pharmacological activity [4,5].

The individuality and authenticity of the substances was controlled by PC and TLC methods.

a) Derivatives of aminocolchamine with methylethylethynylcarbinol. A portion of 1.0 g of aminocolchamine was dissolved in 17 ml of dried and freshly distilled dioxane, and 0.12 g of paraform, 0.01 g of hydroquinone and 0.03 g of copper monochloride were added to the solution. After adding another equimolecular amount of methylethylethynylcarbinol to the solution, the contents of the flask were mixed well. Reaction conditions table 1.

Table 1. Reaction conditions of methylethylethynylcarbinol with colchamine

№	Reagent	Estimate damount of reagent	Reagent taken	Product yield (%)
1.	Aminocolchamine	0,74	1,0	91

The reaction mixture was heated in a glycerin bath under reflux at 70-90°C for 4-6 hours. The end of the reaction was determined by thin layer chromatography of the reaction mixture.

After the practical completion of the reaction, insoluble in dioxane substances were separated by filtration and the solvent (dioxane) was distilled off on a rotary unit. The residue was dissolved in 20-30 ml of chloroform, the resulting very dark chloroform solution was extracted three times with 20 ml of 5% acetic acid.

The acetic acid extract contains unreacted aminocolchamine, which was isolated by alkalizing the acidic solution with ammonia and extracting it with chloroform.

The chloroform solution of the reaction product, after separation of the starting aminocolchamine, was dried over anhydrous sodium sulfate, the sulfate was filtered off and the filtrate was passed through a small layer (5-7 g) of aluminum oxide. In this case, the dark extract is greatly clarified. The solvent was distilled off and the reaction product was dried in a vacuum desiccator.

The final reaction products are obtained as non-crystalline light yellow powders.

4- (aminocolchamino N / 1,1-methylethylbutin-2) carbinol (3).

IR spectrum: 1120, 1170, 1720, 2570, 2950, 3410, 3540 cm^{-1}.

NMR spectrum: 1.26; 1.45; 1.49 (CH_3CH_2), 1.98 (CH_3), 2.16 (N-CH_3), 3.58; 3.85 x2, 3.88 (3H x 4, ss, 4OCH_3), 5.16 (OH), 6.48 (H-$_4$), 6.94 (H-11), 7.24 (H-12 and H-8) ppm.

Findings.

1. Synthesized new derivatives of aminocolchamine with methylethylenethylcarbinol.

2. The synthesized compounds are confirmed by PMR and IR spectral data.

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Impact Factor:					
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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 21.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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SYNTHESIS OF A NEW AMINOCOLCHAMINE DERIVATIVE WITH METHACRYLIC ACID PROPARGYL ESTER

Abstract: *New esters of methacrylic acid 4- (aminocolhamino-N-butin-2-yl) esters of methacrylic acids have been synthesized. The structures of the synthesized compound were confirmed by the data of IR and PMR spectra.*

Key words: *Colchamin, aminocolchamin, propargyl, methacrylic acid.*

Language: *English*

Citation: Alikulov, R. V., Safarov, A. M., Bozorov, Y. Sh., & Khamraeva, M. F. (2021). Synthesis of a new aminocolchamine derivative with methacrylic acid propargyl ester. *ISJ Theoretical & Applied Science, 12 (104),* 782-785.

Soi: http://s-o-i.org/1.1/TAS-12-104-82 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.82

Scopus ASCC: *1600.*

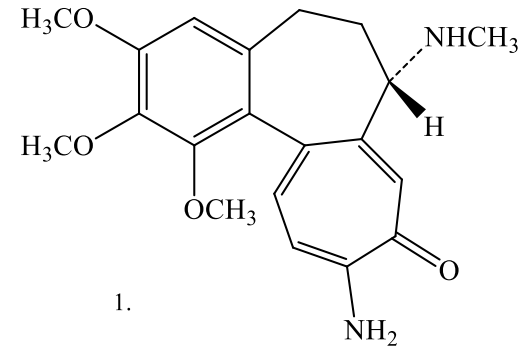
Introduction

Recently, propargyl ethers have attracted attention due to a wide range of useful properties (propargyl ethers exhibit biological activity, inhibiting corrosion and promoting the flotation of rare metals, increasing the energy intensity of complex rocket fuels). However, up to now in the literature there are practically no generalizing reviews on the methods of synthesis, physical, chemical and applied properties of this class of heteroatomic acetylenes [1].

Among the numerous chemical compounds with antitumor activity, much attention is paid to the tropolone alkaloids of liliaceae. In order to find less toxic compounds in this series, a large number of colchicine and colchamine derivatives have been synthesized.

It is known that the introduction of groups containing an acetylene bond into a drug molecule significantly reduces their toxicity. In view of the fact that such work in the field of colchicine alkaloids has not been carried out previously, we synthesized derivatives of aminocolchamine with propargyl ester of methacrylic acid (3) [2].

Starting compounds for the synthesis of acetylene derivatives of aminocolchamine:



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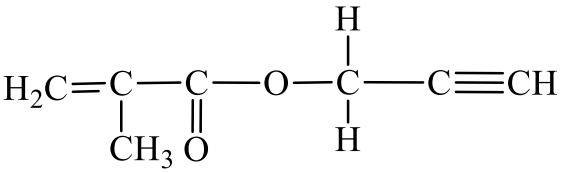


The condensation reaction of amincolhamine with acetylenic compounds was carried out according to Mannich [3], in equimolecular ratios of the reagents:

The main starting compound - aminokolchamin (1) for the carried out synthesis obtained the isolated colchamine from Colchicum luteum baker growing in the Surkhandara region.

As a result, we have synthesized; aminocolchamin-4- (aminocolhamino-N-butin-2-yl) esters of methacrylic (5) (Table 1) [4].

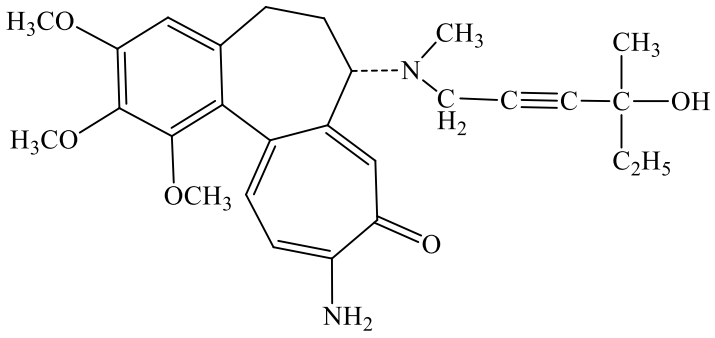
Upon hydrolysis of ester 4, 4- (colhamino-n-butin-2-yl) alcohol 6 is formed.

The resulting compounds are light yellow powders with close Rf values. At the same time, in terms of chromatographic mobility, they strongly differ from the starting aminocolchamines, having high Rf values.

The structures of the synthesized compound were confirmed by the data of IR and PMR spectra. The IR spectra of compounds with the ester group (3-4) show absorption bands of the carbonyl group (1735-1730 см^{1}).

Aminocolchaminic fragments of the synthesized compounds in the PMR spectra do not differ significantly: the signals of the N-methyl group appear at 2.20-2.22 ppm, methoxyl groups - 3.56-3.60 (at C-1) and 3.82 -3.85 ppm. (at C-2, C-3 C-10), proton H-4 - at 6.44-6.51 ppm, H-8 - 7.90-7.96 ppm, H- 11 - 6.68-6.75 ppm. and H-12 7.17-7.22 ppm.

Table 1. Synthesis of acetylene derivatives



A characteristic feature of all acetylene derivatives is the presence in their PMR spectra of a two-proton doublet from the bridging N-CH2 group, which manifests itself in the region of 3.32-3.38 ppm. The bridging OCH3 group present in compounds 4-5 forms a narrow two-proton doublet in the range of 4.53-4.70 ppm.

Signals of C-alkyl groups appear in the strongest field of the spectrum (1.4-2.0 ppm) and are easily deciphered. The olefinic protons of methacrylic esters resonate at 5.98 ppm. (cis-) and 3.48 ppm. (trans-

protons). The most complex spectra of colchamine and aminocolhamine with propargyl ether propargyl ether of methacrylic acid, in which the signals of the protons of two benzene rings overlap.

Experimental part. IR spectra - on a UR-10 two-beam spectrometer in KBr, PMR spectra - on a Varian XL-100 instrument in $CDCl_3$

a) Derivatives, aminocolhamina with esters of organic acids. A weighed portion of 1.0 g of aminocolchamine was dissolved in 17 ml of dried and freshly distilled dioxane, and 0.12 g of paraform, 0.01 g of hydroquinone and 0.03 g of copper monochloride were added to the solution. After that, adding an equimolecular amount of methacrylic acid propargyl ester to the solution, the contents of the flask were mixed well.

Table 2. Reaction conditions methacrylic acid propargyl ester with colchamine amine.

№	Reagent	Estimated amount of reagent	Taken amount of reagent	Product yield (%)
1.	Aminokolchamin	0,35	0,51	78

The reaction mixture was heated in a glycerol bath with a reflux condenser at 70-90 ° for 4-6 hours. The end of the reaction was determined by thin layer chromatography of the reaction mixture.

After the reaction was practically completed, the dioxane-insoluble substances were separated by filtration, and the solvent (dioxane) was distilled off on a rotary unit. The residue was dissolved in 20-30 ml of chloroform, the resulting very dark chloroform solution was extracted three times with 20 ml of 5% acetic acid each.

The acetic acid extract contains unreacted colchamine, which was isolated by alkalinization of the acidic solution with ammonia and extraction with chloroform.

The chloroform solution of the reaction product, after separation of the starting colchamine, was dried over anhydrous sodium sulfate, the sulfate was filtered off and the filtrate was passed through a small layer (5-7 g) of alumina. In this case, the dark extract is strongly lightened. The solvent was distilled off and the reaction product was dried in a vacuum desiccator.

The end products of the reaction were obtained in the form of non-crystalline light yellow powders.

Due to the alkyl (and not acyl) nature of the substituents introduced into the amino group, the resulting derivatives retain some basicity (especially with the pyridine ring), which makes it difficult to separate the colchamin impurity from the reaction products. Therefore, for this purpose, they resorted to the method of chromatography on alumina (eluents of a mixture of ether-acetone, acetone and acetone-methanol).

4- (aminocolhamino-N-butyn-2-yl) esters of methacrylic acid (5).

IR – spectrum. 1100, 1170, 1720, 2570, 2950, 3400, 3540 $см^{-1}$.

PMR spectrum. 1,26; 1,45; 1,49 (CH_3CH_2), 1,98 (CH_3). 2,16 (N-CH_3), 3,58; 3,85 x 2, 3,88 (3H x 4, cc, 4 OCH_3) , 5,16 (OH), 6,48 (H-4), 6,94 (H-11), 7,24 (H-I2 и H-8) м.д.

1. Synthesized a derivative of aminocolchamine with propargyl ester of methacrylic acid.
2. The structures of the synthesized compounds were confirmed by IR and PMR spectra.

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 21.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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THE CONCEPT OF INTEGRATION IN PRIMARY EDUCATION

***Abstract**: This article discusses what the idea of integration is in primary education, its role, the views of various scholars, how to apply it in the educational process, integration analysis and feedback on the example of science of reading. Appropriate conclusions were drawn.*

***Key words**: Primary education, integration, innovation, interaction, analysis, Y.A.Samarin, literature, differentiation.*

***Language**: English*

***Citation**: Rakhmatullayeva, M. A., & Avezova, R. R. (2021). The concept of integration in primary education. ISJ Theoretical & Applied Science, 12 (104),* 786-788.

***Soi**: http://s-o-i.org/1.1/TAS-12-104-83 **Doi**: https://dx.doi.org/10.15863/TAS.2021.12.104.83

***Scopus ASCC**: 3304.*

Introduction

Today integration is a guiding principle in the development of modern education systems. One of the peculiarities of the idea of integration is the ability to deepen and increase the interdisciplinary and intradisciplinary knowledge of the child's personality in the learning process, as well as the ability to apply them to life.

The word "integration" comes from the Latin word "integration" - to restore, to supplement, to integrate.

A concept that describes the state of interdependence of a system or individual parts and functions of an organism and the process that leads to such a state;

The process of convergence and interaction of sciences; accompanied by differentiation (Mavlonova, Rahmonkulova. 2009).

Integration is a means of accepting new ideas within the boundaries of subject knowledge. The idea of integration was introduced in the 18th century by the English scientist G. Spencer. Scientists have done a lot of work to solve the problem of integration "Integration and the combination of innovative thinking in the system of professional development: problems and solutions (Proceedings of the International Scientific and Practical Conference, Karshi. 2020)

Significant and urgent work has been done in developed countries on the integration of educational content. The integration of educational content has been achieved in the United Kingdom, Japan, Hungary and Hong Kong. Between the 19th and 20th centuries, the idea of creating an integrated course for small school students to get acquainted with the natural environment emerged in pedagogy. This idea is related to the names of A.Y. Gerd, D.N. Kaygorov, A.P. Pavlov, who demanded the introduction of an undivided course on the animate and inanimate world around the primary school. The psychological basis of the process of integration of school education can be taken from the views of the scientist YA Samarin on associative thinking. The idea is, "Any knowledge is an analogy, and a system of knowledge is a system of analogies." (Mavlonova, Rahmonkulova. 2009).

The goal is for primary school teachers to use the integration process in every lesson! Why in elementary school? It is well known that the younger

generation, which has taken the first step on the threshold of science, does not have an idea of the importance of education and how to apply it to life. Therefore, it is advisable to use integration in this regard. The integration of education, in turn, increases the enthusiasm of students, interest in learning subjects, increases the level of knowledge in the subject, develops their intellectual activity, the interaction of educational materials in a natural way.

Provides to organize integrated lessons, you must first determine which lessons are suitable for integration. The basis of such lessons is the closeness and logical connection of the content of the main topics of different disciplines[4] Adelman, C. 1998. Women and Men of the Engineering Path: A Model for Analysis of Undergraduate Careers. Washington, D.C.: U.S. Department of Education..

As an example, through the story of “Qizcha va qarg’alar” or in English “The Girl and the Crows” in the Grade 3 Reading textbook, we can further strengthen students ’knowledge and broaden their worldview by linking multiple subjects in the classroom (Adelman, C. 1998.; Teacher Publishing House Tashkent. 2019).

Table 1.

A picture of autumn, crows flying, crows, the image of the morning, the crackling of a walnut falling from a tree	The number of lines in the text of the story, the number of words, sentences; Phrases with number: one pair, one day, the first crow, the second came…	Types of sentences in the story; words belonging to the category of adjectives such as high, stubborn, hard, stern; Words related to a group of verbs, such as pulled, picked up, came, went up, landed, bit, threw on the ground, got used to, did not panic, flew away; types of tenses
Natural science	Mathematic	Mother tongue

In terms of upbringing, the girl pities the birds and bites the nuts to help them, runs to the edge of the corridor so that they can eat without fear, the crows get used to the girl, and the squirrels get better after they recover from the disease. We can teach students as an example of the science of education.	And to the technology, we can share additional knowledge about what concrete is, what a porch is, how to build a yard, using the example of a high-rise house in the story, a wide concrete hallway, stones, porches.	
Education science	Technology science	

When a lesson is taught through integration, learners develop several life skills as logical thinking, creativity, ingenuity, the ability to analyze and draw conclusions across disciplines and topics, and the ability to acquire and consolidate knowledge independently (Barke, Lane, at al. 2001.; International Conference, Europe’s 21st Century Politics for Sustainable Technological Innovation. 2005.; Williams, 2003.; Schacterle, 1997.; Alain de, Botton. 2019.; Lidtke, Seagrave, at al. 2004)

In short, the development of such new innovative ideas in the education system will allow every student to fully master the sciences, to grow in all directions. If every primary education teacher conducts each subject on the basis of an integrated approach, as shown in the analysis above, no student will be indifferent, irresponsible, fearful of learning, that is, there is no such thing as a high level of complexity, such as a loss of interest!

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SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 12 **Volume:** 104

Published: 21.12.2021 **http://T-Science.org**

QR – Issue QR – Article

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EFFECTIVENESS OF NEW DEFOLIANTS

Abstract: *The use of a new defoliant Ento-Defol for artificial leaf fall of cotton bolls with an opening of 50-60% per hectare with a norm of 0.15 l/ha, compared with other options, high results were obtained. And the use of the defoliant FanDEF-alo with a norm of 6.0 l / ha showed good results than other options.*

Key words: *defoliation and types of defoliants, cotton leaves, dry and semi-dry leaves.*

Language: *Russian*

Citation: Ubaydullaev, M. M., Askarov, Kh. Kh., & Mirzaikromov, M. A. (2021). Effectiveness of new defoliants. *ISJ Theoretical & Applied Science, 12 (104),* 789-792.

Soi: http://s-o-i.org/1.1/TAS-12-104-84 ***Doi***: https://dx.doi.org/10.15863/TAS.2021.12.104.84

Scopus ASCC: *1100.*

ЭФФЕКТИВНОСТЬ НОВЫХ ДЕФОЛИАНТОВ

Аннотация: *Применение нового дефолианта Энто-Дефол для искусственного опадения листьев коробочек хлопчатника при раскрытие 50-60% на гектар с нормой 0,15 л/га, по сравнению с другими вариантами получены высокие результаты. А применение дефолианта ФанДЕФ-аъло с нормой 6,0 л/га наблюдалось хорошие результаты, чем у других вариантов.*

Ключевые слова: *дефолиация и виды дефолиантов, листья хлопчатника, сухие и полусухие листья.*

Введение

УДК: 633.511/631.542.4.

Известно, что при дефолиации хлопчатника, наряду с опадением листьев хлопчатника, ускоряется созревание и раскрытие коробочек, увеличивается выход волокон, мягко действует по борьбе против вредителям и болезням в хлопчатнике, повышается урожайность по первой уборке хлопка и общий урожайности, а также улучшает качество, что даёт возможность во время выполнять осенних-зимных мероприятий [5].Конечно, для этого необходимо знать норму дефолиантов которые применяют в хлопчатнике. Причина в том, что если привысить норму дефолиантов применяемых в хлопчатнике, то негативна влияет на качеству семян и волокон, наборот, если применять их в низком норме, то не дает ожидаемого эффекта, то есть ученые доказали что сделаные затраты уйдут в пустую [6].

С этой точки зрения резкие отличие друг от друга особенность дефолиантов созданные последние годы, принимают во внимание измение климата и механизация уборочных работ,

разработка новых мягко действующих дефолиантов применяемых в норме является актуальной задачей [2].

Методика исследований

Исходя из вышеизложенных актуальных задач нами исследования по данной теме на 2018-2020 годы проводились в полевых почвенных условиях научно-исследовательском институте селекции, семеноводства и агротехнологии выращивания хлопка, расположенного в Кувинском районе Ферганской области с высоким уровнем влажности почвы, менее засоленной, на глубине 1,6-1,8 метра [7-10]. В эксперименте для каждого сорта было получено по 8 вариантов, размещенных по 3 повторности.

К выделенным вариантам С8290 сортов хлопчатника С8290 и С6775 при сроке расскрытие листьи коробочек хлопчатника 30-40% также 50-60% в период опадение мягко действует дефолиант Энто-Дефол с нормой 0,10-0,15-0,20 л/га, а местный дефолиант ФанДеф-аъло с нормой 5,0-6,0-7,0 л/га контроль также сравнивая с жидким дефолиантом хлорат-магний (8,0 л/га) определелиле применение норму и срока. Научные исследование проводились на основе методических пособий УзПИТИ “Методика полевых опытов с хлопчатником” (1981), “Методика проведения полевых опытов” (2007) и принятой Государственной комиссии химии Республики Узбекистан “Методические указание испытание дефолиантов в хлопчатнике” (1993, 1994, 2004).

Результаты исследовании и их обсуждение

В ходе проведения наблюдении и анализа С-8290 коробочек сорта хлопчатника в сроке 50-60%, то есть через 14 дней после дефолиации в контрольном варианте число естественных опавших лист составило 10,0%, а число зеленых лист составило 86,5%. Жидкий дефолиант хлорат-магний с нормой 8,0 л/га в качестве эталона применяемых вариантах через 14 дней после дефолиации определено опадение листьев около 85,9% хлопчатника [1].

Наиболее высокие результаты дефолианте Энто-Дефол наблюдались в варианте где применяли с нормой 0,15 л/га через 14 дней после дефолиации опадение листьев хлопчатника составило 88,4%. Нужно следует отметить, что С-8290 сорт хлопчатника при сроке раскрытии 50-60% коробочек в вариантах где применяли нового дефолианта Энто-Дефол с нормой 0,15 л/га эффективность дефолиации чем у контрольного варианта и дефолианта Жидкий ХМД (8,0 л/га) оказало больше опадение листьев.

Наиболее высокие результаты исследований в дефолианте ФанДеф-аъло варианте где применяли с нормой 6,0 л/га, через 14 дней после дефолиации, листья хлопчатника опадали до 87,7%, определена 0,2% полу сухих листьев сохранились в кустах хлопчатника (рис.1.).

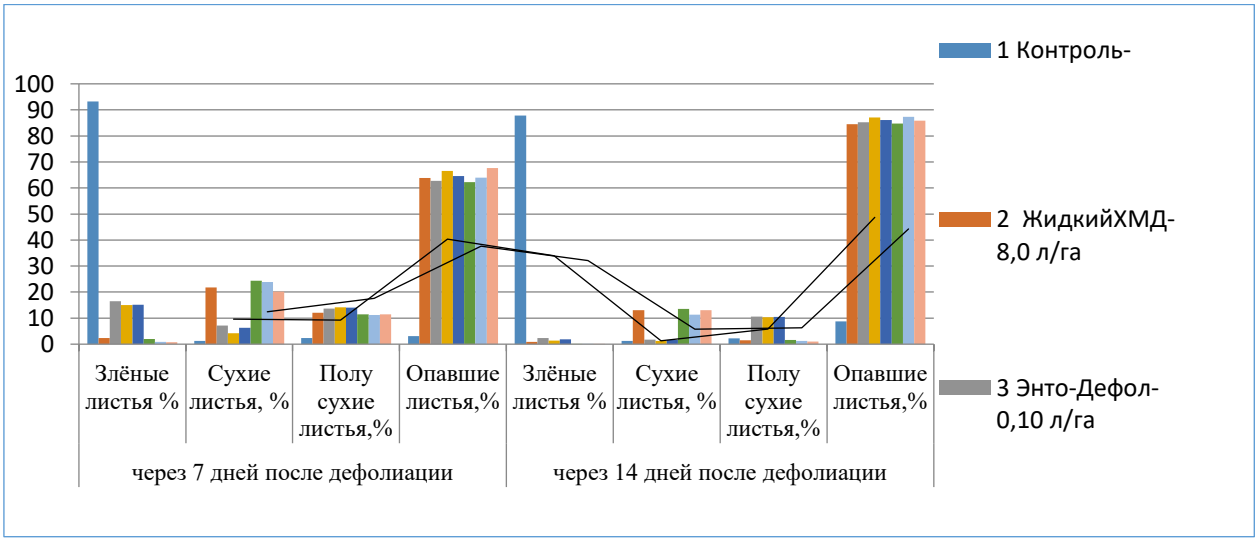

Рисунок 1. Результаты исследования.

Во втором варианте С-6775 сортах хлопчатника в сроке раскрытие коробочек 50-60% при проведение дефолиации контрольном варианте отмечено что, через 14 дней после дефолиации естественное опадение листьев составило 8,8% ,а зеленые листья 87,8%.

В варианте где качестве этанола применяли дефолиант Жидкий хлорат-магний 8,0 л/га, через 14 дней после дефолиации определена опадение листьев хлопчатника до 84,5%.

Наиболее высокие результаты где применяли дефолианта Энто-Дефол с нормой 0,15 л/га, через 14 дней после дефолиации листья хлопчатника опадали около 87,1%, отмечено что 10,3% полусухих листьев сохранялись в кустах хлопчатника [3].

Следует сказать, эффективность дефоляции этого нового дефолианта Энто-Дефол в вариантах где применяли с нормой 0,15 л/га наблюдалось опадение листьев хлопчатника высоком уровне чем контрольном варианте и дефолианте Жидкий ХМД (8,0 л/га).

В варианте где применяли дефолиант ФанДЕФ-аъло с нормой 6,0 л/га через 14 дней после дефолиации листья хлопчатника опадали высоком проценте, хотя 1,2% листья полу сухом виде сохранялись в кустах хлопчатника под влиянием дефолианта эта норма дефолианта показал высокий результат, чем норма применяемых других вариантах (рис.2.)[4].

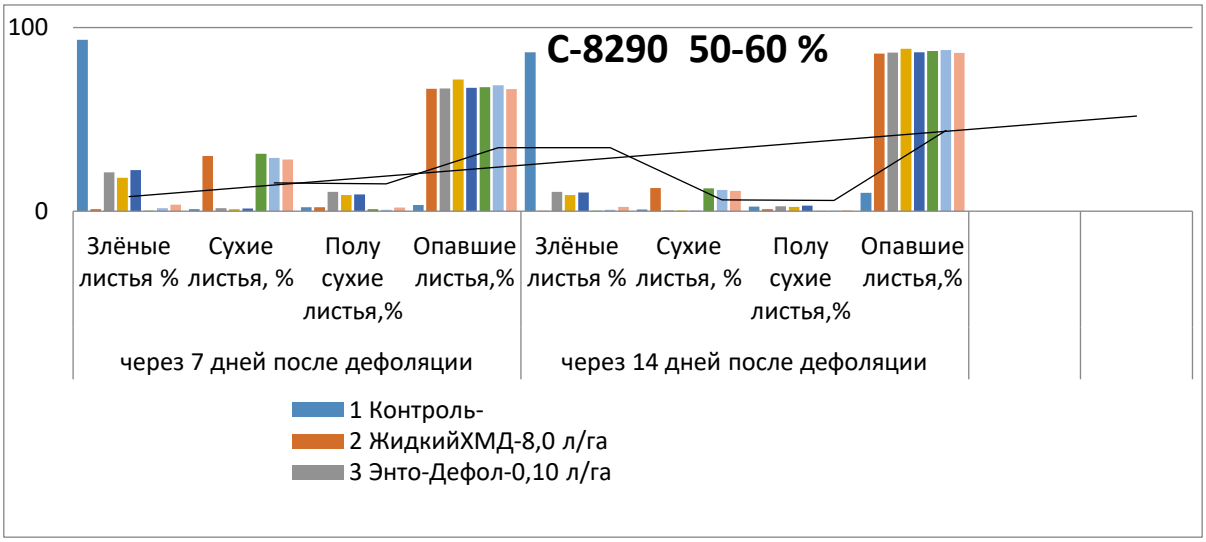

Рисунок 2. Результаты исследования.

На основе результатов научных исследований проведеных Ферганской области в условиях лугово – солончаковых почв можно сделать такие выводы.

Выводы

Проведенные исследования показали, при раскрытии коробочек 50-60% сорта хлопчатника С-8290,в вариантах где применяли дефолианта Энто-Дефол с нормой 0,15 л/га наблюдалось высокое опадение листьев. Также, в вариантах в котором применяли дефолиант Фан Деф-аъло с нормой 6,0 л/га, было установлена, что опадение листьев высокое.

Дефолиант Энто-Дефол с нормой 0,15л/га С-6775 сортах хлопчатника при раскрытие коробочек 50-60%, а дефолиант ФанДЕФ-аъло с нормой 6,0 л/га оказывали высокое влияние на опадение листьев в вариантах.

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«Theoretical & Applied Science» (USA, Sweden, KZ)
Scientific publication, p.sh. 85.25. Edition of 90 copies.
http://T-Science.org E-mail: **T-Science@mail.ru**

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