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Methods of design in clothing construction and modeling

Abstract. This article examines methods of clothing design that students apply in the discipline "Construction, modeling, and technology of sewn products." The use of various design methods contributes to the creation of new, modern clothing designs, as well as optimization and innovation in clothing construction and modeling, taking into account its functionality and aesthetics.

Keywords: methods of design, construction and modeling of clothes.

Design is an organized process regulated by the Unified system of design documentation, which outlines theoretical and practical principles, rules, techniques, norms, and requirements. A distinctive feature of designing in clothing construction and modeling is the study and practical application of various construction methods, enabling the realization of contemporary original ideas. The primary method involves combining clothing constructions in different ways, allowing for the creation of product forms using a limited number of elements through variation and composition. This method is employed in the construction and modeling of clothing by students at the Sergiev Posad Institute of Toys.

The transformation method implies dynamics and changes within the details of a single form. For example, a collar can fold into pleats or unfold into a hood; a long skirt transforms into a short one with drawstrings in casings; a jacket with detachable sleeves becomes a vest, and so on.

The rearrangement method involves placing structural-decorative elements on unusual parts of the garment's surface or replacing them.

The insertion (cut-in) method is used to create complex shapes from simple ones. It can be applied by dividing the shape with gussets, flounces, ruffles, zippers, pockets, or by threading ribbons.

Another combinatorial design method is ***the kinetism method***, which is based on the idea of form movement using various decorations or combinations of fabric patterns and textures. Although relatively new in clothing design, the kinetism method has a stable tendency to develop and expand its application in garment construction and modeling.

The method of creating sizeless garments is another combinatorial design technique whose possibilities are unlimited because specific measurements are not taken into account. This type of construction is primarily used for knitwear and highly stretchable materials, making it relevant in modern times by enabling the design of universally sized clothing. This approach allows for the creation of styles that accentuate figure advantages while concealing flaws.

Figure 1. Dress models created using the sizeless construction method by students specializing in "Design, modeling and technology of sewn products"

Figure 1[31] shows dress models made using the sizeless construction method by students specializing in "Design, modeling and technology of Sewn Products". The combinatorics method involves creating complex garment shapes from a single piece of fabric. It was applied in traditional clothes of different nations such as saris and dhotis in Indian attire; ponchos and capes in Latin American countries; ponevas and methods of tying scarves among Slavic peoples. The method is interesting both technically and from a design perspective. For example, a whole piece of cloth can be transformed into an Indian sari, a dress, a skirt, a smock, or even a blouse or cape. Figures 2 and 3 show products designed by students majoring in "Design, modeling and technology of sewn products", made from a single piece of fabric (Greek and Roman women's costumes) [5].

Figure 2. Greek female costume created by students studying "Design, modeling and technology of sewn products"

Figure 3. Roman female costume created by students studying "Design, modeling and technology of sewn products"

[31] Fig. 1-6. Photos by co-author S.V. Kon'kova.

Thus, the combinatorial method represents research, exploration, functional and graphic systems, and the use of typical elements for developing individual models as well as series of products. This design method enables combining different elements with various types of fabrics—such as reportage, knitted, etc.—to create unique designs [3].

Besides the combinatorial method, other approaches include modular design and deconstruction techniques [4].

The modular design method in clothing construction and modeling assumes structural, technological and functional completeness. At the same time, the product may either be complete or represent one of the components of a particular set. Modules, as individual elements, have simple geometric shapes, repeating motifs and must fit perfectly within the chosen shape without any leftovers. When designing clothing, modules are selected depending on human dimensions, height, and the model's characteristics.

A key feature of using modules in clothing design is the finishing treatment, both on the front and back sides of the fabric, where each module must be processed separately. By incorporating various materials or colors into the modules, textured or color patterns can be formed. Additionally, when constructing modules composed of geometric shapes (squares, rectangles, triangles, circles, rhombuses, etc.), decorative materials (ribbons, zippers, cords, lace, etc.) or hardware (hooks, buttons, velcro, etc.) can be employed, generating additional aesthetic effects. In N.O. Sosnina's study "Costume Mockup," detailed information about the application of modular systems and their potential in student projects related to sewing design is provided [8].

The use of ***the deconstruction method*** implies abandoning conventional division of structures and the use of traditional construction in favor of modular modeling, as well as employing specific cutting techniques. As noted by Y.L. Gerasimova, «...deconstruction implies destruction, stratification and disordering of structures» [2, p. 2]. Clothing created using this method appears incomplete, asymmetrical and intentionally poorly fitted.

The deconstruction method, which transforms all rules and trends, was introduced by Japanese designers R. Kawakubo and Y. Yamamoto in the 1980s and 1990s. Their work had a profound impact on contemporary fashion. Deconstructive techniques are utilized to achieve expressive designs that reflect the spirit of the times, embodying a new perception of life and the mindset of an era characterized by free associativity and a rejection of rationalism. This method involves the use of large volumes, unhemmed hems, uneven and unfinished seams, various tears, assorted slits, misaligned fastenings, turned-out collars and exposed darts, along with elements of incompleteness and deviations from traditional technologies. However, intricately cut necklines and chaotic openings instead of sleeves are also incorporated [7].

Students at Sergiev Posad Institute of Toys, who specialize in design, modeling and technology of sewn products, also apply the deconstruction method in their coursework during project implementation. One such project features an item

constructed from intricately cut separate modules (Fig. 4), with unfinished seams deliberately left exposed.

Figure 4. A dress with intricately shaped modules created by students specializing in "Design, modeling and technology of sewn products"

When applying the deconstruction method or the "overturning" and "rearrangement" method, there is a deliberate disruption of conventional artistic clothing design practices.

Clothing may appear absurd since it might be sewn with seams facing outward, featuring numerous external pockets, or be double-sided suits wearable from both sides, with decorative elements placed in unexpected locations, etc. Furthermore, this method disrupts the conventional classic ensemble of "jacket – skirt – blouse" [6].

Students M. Motorina and Yu. Martynova from the Sergiev Posad Institute of Toys, utilizing the deconstruction method, developed a series of clothing models. They transformed classic pants into semi-sports pants with cuffs (Fig. 5) and created a suit with shorts-style pants and a jacket with shortened 5/8-length sleeves (Fig. 6). The students completed a series of exploratory sketches and drafted scaled (1:4) and full-size technical drawings.

Figure 5. Martynova Yu. Model with deconstruction (disruption) of the classical suit ensemble. Women's suit with semi-sports style pants on cuff

Figure 6. Motorina M. Model with deconstruction (disruption) of the classical suit ensemble. Women's suit with shorts

One of the methods that students learn is designing an item "from scratch," determining its functionality, size, height, fullness and age appropriateness.

Another method is modeling clothing constructions based on basic principles, where initial data can come from sketches or photographs of clothing models [3, pp. 5-6].

Using these design methods enables students to create innovative, modern items during their studies, fostering creative abilities and thinking, allowing them to reach higher levels of creativity and professionalism.

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