

Creating Sustainable Educational Clothing Designs for Children with Learning Disabilities Using the Biomimetic Strategy

Dr- Sahar Aly Zaghloul Aly

Associate Professor, Department of Fashion Design, College of Design, Qassim University,
Professor, Department of Clothing and Textiles, Faculty of Home Economics, Helwan University,
sah.ali@qu.edu.sa

Walaa Sameer Othman Banjar

Lecturer, Department of Fashion Design, Faculty of Design and Arts, Umm Al-Qura University,
Postgraduate Studies at the Department of Fashion Design, Faculty of Design, Qassim University,
wsbanjar@uqu.edu.sa

Abstract:

The research aims to study the characteristics of children with learning disabilities in early childhood using the biometric strategy in the sustainable design to create sustainable educational clothing designs. Also measuring the acceptance of consumers (mothers - supervisors) in the field of clothing and textiles for the educational clothing designs and implementing innovative designs that achieved the highest degrees of acceptance from the research samples. **Methodology:** The study followed the descriptive analytical approach with the application in the research, and the sample was limited to (57) distributed among (specialists - consumers " the mothers of children – the supervisors in centers of learning difficulties"). The chosen categories were (15) professors, associate professors, and assistant professors in the field of fashion design, consumers (the mothers of children with learning difficulties), and they are (31). Lastly, consumers (the supervisors of children with learning disabilities) and they are (11). Their opinion was taken on the proposed designs, and the used tools included two questionnaires; one directed to the specialists in the field of fashion design. The other one directed the consumers (mothers and supervisors of the children with learning disabilities) to measure the degrees of acceptance of the proposed sustainable educational clothing designs. **The results** show that there is a correlation relationship between the order of both specialists and consumers (children's mothers) regarding the axes and items of the questionnaire has reached (0.991), which is a statistically significant value at the level (0.01), and that is a direct relationship. It indicates that there is an excellent agreement between their opinions. There is also a correlation between the order of specialists and consumers (children's mothers) in the light of axes and items amounted to (0.991), which is a significant value at the level (0.01) statistically. It indicates there is a direct relationship and a great agreement between their opinions. There is a correlation between the order of consumers (children's mothers) and consumers (supervisors) in the light of the axes, and items of the questionnaire amounted to (0.796), which is statistically significant value at the level (of 0.01). It is a direct relationship that indicates a great agreement between their opinions. The biomimetic strategy was employed successfully in designing sustainable educational clothing for children with learning disabilities especially, and in fashion design industry in general.

Keywords:

Biomimetic, Sustainability, Children with Learning Disabilities, Sustainable Educational Clothing Designs

References:

1. Abdo, S. A. (2014). Environmental Science approach of the 3rd millennium and impact on the field of industrial design, *International Design Journal*, 4(2), Scientific Association of Designers, Cairo.
2. Abdel Kafi, I. F. (2003). *Innovation and its Development among Children*, Al-Dar Al-Arabiya, Cairo.
3. Aboel khair, A., Ezzat, M. S., and Hamza, A. F. (2019). The role of biomimicry in developing architecture design process (creation & design process), *Journal of Al Azhar University Engineering Sector*, 14(52), Faculty of Engineering, Al-Azhar University.
4. Abu Banyan, I. S. (2019). Learning Disabilities and General Education Teachers' Role in Providing Services. King Salman Center for Disability Research, Riyadh.
5. Abu Musa, I. F. (2008). *Fashion Design and its Development – Development Concept, Fashion Accessories and Applied Methods*, Dar Al-Zahraa, Riyadh.

6. Abdul Al-Halim, Z. Y. (2017). The Effectiveness of a Training Program in the Treatment of Primary Developmental Learning Disabilities among Pre-School Children, *Arabic Studies in Education and Psychology*, (90), Arab Educators Association, Cairo.
7. Abdul hamid, M. I., Fikri, I. J., and Jawdah, A. M. (2017). A proposed program in developing some speaking skills among kindergarten children with academic learning difficulties, *Kindergarten College Journal*, (10), Faculty of Kindergarten, Port Said University.
8. Ahmed, S., (2018). "Bio mimicry as an innovation in modern Architecture Design", *Journal of Architecture, Arts and Human Monistic Sciences*, Issue 110, The Arabic Association of Civilization and Islamic Arts.
9. Ajlan, O. M. and Al-Shehri, F. F. (2014). *Planning Children Clothes' Patterns by Computer*, Uni Art for Printing and Publishing, Cairo.
10. Al-Dhafiri, N. M. (2018). Psychological Needs Introduction to Early Detection of Developmental Learning Disabilities for Pre-School, *International Journal of Educational Psychological Studies*, 4(3), Refaad for Studies and Research.
11. Al-Hajry, I. M. (2020). Utilizing technically mixed materials for producing children's clothes. *International Design Journal*, 10(2), Scientific Association of Designers, Cairo.
12. Al-Khatib, A. A. (2015). *Introduction to Learning Disabilities - A Practical Guide for Teachers of Learning Disabilities*, Modern Book's World, Amman.
13. Al-Rashidi, S., and Abdul Jabbar, A. (2017). Early Diagnosis of Learning Disabilities at the Kindergarten, *Journal of Special Education*, (20), Center of Information and Educational, Psychological and Environmental Services, Faculty of Disability Sciences and Rehabilitation, Zagazig University.
14. Al-Tanani, B. S., Abdel Salam, S., A. and Badawi, M. H. (2020). The effectiveness of a program in reducing social learning disabilities of kindergarten children, *International Journal of Educational and Psychological Sciences*, 17(36), Arab Institute for Scientific Research and Human Development, Jordan.
15. A Study on the Impact of Fast Fashion on Sustainability in the Women's Wear Design Field, *International Design Journal*, 7(1), Scientific Association of Designers, Cairo.
16. Al-Zaher, Q. A. (2012). *Learning Disabilities*, (5th ed.), Dar Wael for Publishing and Distribution, Amman.
17. Attman, O., (2010). "Green Architecture Advanced Technology And Materials", Mc Graw Hill, USA.
18. Boutros, H. B. (2016). *Academic and Developmental Learning Disabilities*, (2nd ed.), Dar Al-Zahraa for Publishing and Distribution, Riyadh.
19. Costa, A. Soarea, I. Pinto, B., Oliveira, M., & Szczygiel, N., (2018). "Innovating in the Fashion Industry for More Sustainable Production and Consumption", Academic Conferences International Limited sep Singapore, University of Aveiro, Portugal.
20. Dicks, H., (2019). "The Bio mimicry Revolution in Environmental Epistemology", *Ethics & The Environment*, Vo 24, The Trustees of Indiana University.
21. Ghaith, K. B., and Al-Karabliya, M. A. (2008). *Principles of Artistic Design*, Arab Publishing Library for publication and distribution, Cairo.
22. Hasanin, E. A. M. (2020). A suggested model for children clothes in kindergarten, to suit their functional needs and personal measurements, *International Design Journal* 10(3), Scientific Association of Designers, Cairo.
23. Hashem, E. M. (2015). The technological innovation and sustainable product manufacturing & design, *International Design Journal*, 5(4), Scientific Association of Designers, Cairo.
24. Khoj, H. S. (2013). Perception level of kindergarten normal and at-risk of learning disabilities children, *Scientific Journal of King Faisal University : Humanities and Management Sciences*, 14(2), King Faisal University.
25. *Learning Disabilities and How to Deal with it?*, (2nd ed.), Dar Safaa for Publishing and Distribution, Amman.
26. Matar, A. M. (2020). *Studying the special criteria for designing kindergarten costumes and benefiting from them in designing its clothes* [Unpublished master's thesis]. Faculty of Applied Arts, Benha University.
27. Momen, N. S. (2001). *Formation on the Mannequin: Its Development, Elements, Foundations, Methods and Contemporary Techniques*, Dar Elfikr Elarabi, Cairo.
28. Muhammad, D. A., Al-Najadi, A. and Abdul Karim, E. (2019). The concept of sustainable design and its impact on the quality of the internal environment of interior design, *Journal of Architecture, Art and Humanistic Sciences*, (15), The Arab Association of Civilization and Islamic Arts, Cairo.
29. Muhammad, R. M. and Nooraldin, A. A. (2019, April). The Sustainable Development of Islamic Motifs by Using Three-Dimensional Printing and Employing them in Proposed Designs to Decorate the Mantle of Women, *The Fourteenth Annual Conference, Faculty of Specific Education*, 1, Faculty of Specific

Education, Mansoura University.

30. Mohamed, O. Y. (2019). Environmental scenario as approach for achieving sustainability in product design. *Journal of Architecture, Art and Humanistic Sciences*, (15), The Arab Association of Civilization and Islamic Arts, Cairo.
31. Muhammad, T. M. (2016). Development of rhythmic structure systems in the multi decorative surfaces design through theory of nature simulation "Bio-mimicry," *Journal of Architecture, Art and Humanistic Sciences*, (4), The Arab Association of Civilization and Islamic Arts, Cairo.
32. Musharraf, D. K. (2019). Biomimicry as a means of innovation and sustainability in the field of product design, *Journal of Architecture, Art and Humanistic Sciences*, (18), The Arab Association of Civilization and Islamic Arts, Cairo.
33. Oraby, H., (2018). "Bio-mimicry approach for office building skin adaptable design", Master's Thesis, Faculty of Engineering, Ain Shams University.
34. Othman, S. M., Jamal, D. F. and Anwar. N. S. (2016). The Design of Children Clothes Keeping up with Global Fashion Trends for Safe Sustainable and Ecological Printing Methods. *International Design Journal*, 6(4), Scientific Association of Designers, Cairo.
35. Qamar Al-Din, M. (2014). A trend towards green clothes, *Alqafilah Magazine*, 63(5), Saudi Aramco, Kingdom of Saudi Arabia.
36. Salama, D. N. (2014). Decoration of denim children's clothes by using broadcloth to enrich the aesthetic and educational aspects, *Scientific Journal of the Faculty of Specific Education*, 4(2), Faculty of Specific Education, Menoufia University.
37. Shteiwi, H. A. and Muhammad I. A. (2015). *Measurement and Diagnosis of People with Learning Disabilities*, Dar Al Zahraa, Riyadh.
38. Suleiman, N. S. (2019). A program based on sensory integration strategy in developing pre-academic math skills among kindergarten children at risk of learning disabilities, *The Journal of Special Education*, 8(28), Faculty of Disability Sciences and Rehabilitation, Zagazig University.
39. Tolba, I. M. (2019). *Kindergarten Child's Motor Skills*, (5th ed.). Dar Al-Massira for Publishing and Distribution, Amman.
40. <https://www.almaany.com/ar/dict/arar/%D8%A7%D8%A8%D8%AA%D9%83%D8%B1/> (accessed 13/9/2020)
41. <https://www.stats.gov.sa/ar/news/243> (accessed 2/10/2020)
42. <https://www.spa.gov.sa/1707556> (accessed 2/10/2020)
43. The Goddess of Autumn / VietNam Fashion Week Autumn - Winter 2020 / Fashion Show / NTK VY COLLEN - YouTube (accessed 12/5/2021)
44. Mẫu nhí catwalk với đôi cánh nàng tiên xuân - Spring Fairies (Model kids wearing wings catwalk) - YouTube (accessed 12/5/2021)

Paper History :

Paper received 18th September 2022, Accepted 26th November 2022, Published 1st of January 2023