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EFFECT OF RESIST DYEING TECHNIQUES ON CONTEMPORARY FASHION DESIGN AND TEXTILE ART AMONG STUDENTS OF PUBLIC UNIVERSITIES IN NASARAWA STATE

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Abstract

The study examined the effect of resist dyeing techniques on contemporary fashion design and textile art among students of public universities in Nasarawa State. The study adopted a causal research design involving the administration of a structured questionnaire to a purposive sample of 100 students across various departments in Nasarawa State University, Keffi and Federal University of Lafia. The collected survey data was applied towards estimation of a path model, using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results obtained indicated that exogenous components of competency Level, Access to Resources, Cultural and Artistic Influence, Educational Curriculum and Integration of technology were positive and statistically significant predictors of the application of resist dyeing techniques in fashion design and textile art. Accordingly, targeted interventions were recommended to enhance skills of students of fashion design through specialised training programs or focused coursework. Institutions should also ensure that students have access to the necessary resources for learning and practicing resist dyeing effectively. Also, students should be encouraged to draw inspiration from various cultural and artistic sources in order to enrich their work. Additionally, it is crucial for continuous evaluation and improvement of the curriculum in order to align with industry trends and technological advancements. Finally, Institutions should consider incorporating technology-driven learning tools and digital resources into their educational approaches.

Keywords: Resist dyeing, fashion design, textile art.

Introduction

The entrepreneurial skill acquisition programme in Nigerian tertiary institutions, including those in Nasarawa state, is aimed at developing marketable skill among students in various areas. The acute scarcity of paid jobs highlights self-employment as a viable alternative, and the presence of numerous opportunities in the fashion design sphere emphasizes the significance of resist dying as a profitable career practice.

Resist dyeing is an integral part of the fashion industry involving the application of creative skill and knowledge towards the reflection of style, culture and contemporaneity. A popular process in fabric decoration in textile design, resist dying encompasses a collection of age-old approaches for colouring textiles. The design technique involves safeguarding designated sections of the fabric against dye absorption. This gives rise to patterns, motifs, or colour differentials across the fabric. This allows for darker and lighter colours to be accomplished in the same dyeing process. The prevention of dye absorption can be achieved through various means including the use of chemicals, as well as by physically tying or folding the textile, including stitching and clamping.

Resist dyeing is one of oldest crafts in fabric design and textile art. The patterning technique has featured prominently in fashion design processes and textile art reflecting personal narratives and cultural reflections to social commentary and abstract explorations by textile artists. Such skill is, therefore, crucial in the domain of entrepreneurial competency, considering its relevance in the fabric transformation as a lucrative source of income.

Over the last few years, the demand for west African dresses has gone significantly high not only in the US but also in different parts of the world, the artists however feel that they are not supported enough not only by the government but also the lack of proper platforms for their designs to be celebrated.

Researchers such as Arubayi (cited in Nggusham, 2017) have stressed the importance of directing and motivating students in the area of clothing and textile design. The study, thus, sought to examine factors affecting the adoption of resist dyeing as an important component of fashion design and textile art among students of Nasarawa State University, Keffi and the Federal University of Lafia, especially given the high rate of unemployment among the youth in the state. To meet the research aim, the study sought to test the following hypotheses. Competency level does not have significant effect on the application of resist dyeing techniques in contemporary fashion design and textile art among students of selected universities in Nasarawa state. Access to resources does not have significant effect on the application of resist dyeing techniques in contemporary fashion design and textile art among students of the selected universities in Nasarawa state. Cultural and artistic influence does not have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state. Educational curriculum does not have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state. Technology integration does not have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

Literature Review

Raumer (2022) defined resist dyeing technique as to a processes whereby specific sections of a fabric are prevented from absorbing dye, enabling the creation of varying shades within a single dyeing session. The resist dyeing is one of the oldest means of embellishing fabrics, it is basically a technique of patterning in which a part of fabric surface is covered or reserved prior of dyeing (Anjana et al. 2018). Resist dyeing as a fashion design technique is a distinctive and innovative approach to embellishing textiles that offers notable advantage of crafting exclusive and captivating patterns on fabrics. Resist dyeing and printing techniques involve applying a resist such as wax, starch, or tying/stitching parts of fabric to prevent dye from penetrating those areas. This creates patterns where the dyed and undyed areas contrast.

Fashion design involves creatively putting together garments and accessories through the techniques of cutting, sewing, and embellishing materials such as textiles and leather, incorporating attractive elements like patterns, motifs, shapes, cuts, and colours inspired by diverse cultures (Behera & Khandual, 2017). Hammond, et al (2016) opined that textile art is the process that begins with fibre preparation, progresses through fabric manufacturing, and encompasses raw materials at various stages like lap, roving, card sliver, yarn, and more. These materials can be harnessed at any point in the production cycle to create textile items such as wall hangings, scatter rugs, chair bags, and similar products. The inclusion of textile accessories significantly enhances the establishment of a cozy atmosphere. Dziers cited in Lasisi (2022) asserted that textile design is the creation of stylish and contemporary designs. Again, it requires special skills to create innovative designs. Given that, the understanding derived from these authorities will assist in creating challenging fabric designs that will serve both aesthetical and functional purposes for upholstery fabrics. Borodina and Malika (2023) asserted that textile art involves the imaginative utilization of textiles and fabric elements to craft visual or tactile pieces of art. It includes an extensive array of creative forms, including, but not restricted to, weaving, embroidery, quilting, dyeing, felting, knitting, crocheting, and diverse methods of manipulating fabric. By blending conventional crafting methods with modern artistic ideas, textile artists frequently expand the possibilities of what can be accomplished through textiles.

Tie & dye (resist dyeing technique) weaving is a complex method of ornamentation of textiles which combines many of the processes of ornamentation & different methods applied in India for its development are as follows. Fold resist or bleeding pattern, Stitch resist or Indonesian design, wrap resist or Rajastani Laharia design, Tie resist or Bandhani of Gujarat, Stencil resist or Italian design, Wax resist or Batik design, Mordant resist with Iron & Alum & Resist dyeing of yarn of Odisha, Gujarat & Andhra Pradesh.

Obinnim and Pongo (2018) examined competency models and the teaching of apparel patternmaking in Ghana. It identifies the origins and introduction of competency-based training models in Ghana and examines the gaps that exist between the desired competencies needed for teaching the subject successfully and the challenges that are affecting instructors' competencies. This study employs a descriptive survey design approach; thus, questionnaires were developed and utilized to collect data from the respondents. In order to enable the researchers to use their judgment to select cases that will best facilitate the answering of research questions and meet the objectives of the study, the most common type of non-probability sampling - purposive sampling was used. The sample comprised a total of 119 Participants - eight (8) instructors and one hundred and one (111) students from each of the four Polytechnics. The major empirical findings of the study demonstrate that in CBT, instructors focus their attention on what students have to do and not how they do it. The results also imply that regarding adoption of the different approaches to competency models, the Polytechnics implement competency-based models that are closely aligned with the vision, values and mission which provide broad, quick and consistent impacts. Concerning approaches to teaching apparel pattern making, the results indicate that Polytechnic students are able to transform three-dimensional (3D) fashion designs into two-dimensional (2D) constituent pattern pieces. On strategies to improve competencies, it was discovered that only a few Polytechnics surveyed have sufficient teaching and learning resources for effective academic work.

Dzitse et al. (2023) investigated the competency of lecturers of fashion design programmes and their influence learners' ability to construct Ghanaian Traditional Costumes (GTC). The study adopted convergent mixed method design. The study was conducted in six out of the ten technical universities (TU) in Ghana: Accra, Kumasi, Sunyani, Cope Coast, Tamale and Ho. Target population was 1265 comprising head of departments (HoDs), lecturers and students. Simple random sampling was used to select six universities from the ten TUs. Purposive sampling was used in sampling 24 lecturers of fashion design including HoDs, and Proportion sampling was used to sample 306 fashion design and technology students. Total sample size was 330. Data collection tools were questionnaires for lecturers and students, Interview guide for HODs and observation checklist on availability of GTCs in the TUs. Both quantitative and qualitative data was gathered in the study. Quantitative data was entered, cleaned and analysed using SPSS 22.0 software. Skills of lecturers of fashion design and technology on construction of GTCs using standard multiple regression. Themes were used to summarize Qualitative data using interpretative and coding techniques. The results showed that more than 75% of the lecturers had masters and PhD and were all trained in fashion related courses, acquired skills from practicing FDT also qualify to lecture programme.

Paru (2023) explored cultural influences in contemporary fashion design: a comparative study. This comparative study delved into the multifaceted impact of culture on fashion design, which examined its significance, evolution, and manifestations in various global contexts. Employing a mixed-methods approach, combining qualitative analysis and quantitative data, this research investigated the intricate relationship between culture and fashion, and shedded light on how cultural diversity informs and enriches contemporary design practices. Through a comprehensive exploration of cultural elements, including heritage, traditions, art, and societal norms, this research investigates their profound impact on fashion aesthetics, innovation, and consumer preferences. The findings illuminated the nuanced ways in which cultural diversity enriches and informs contemporary design practices, offering insights into the ethical considerations and challenges inherent in the incorporation of cultural motifs. This comparative analysis aims to contribute to a deeper understanding of how cultural influences shape and redefine the contours of contemporary fashion design on a global scale.

Mateo (2024) investigated the influence of cultural diversity and identity on fashion expression and communication in Mexico. This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. The study looked into already published studies and reports as the data was easily accessed through online journals and libraries. The study found that in Mexico, cultural diversity and identity profoundly influence fashion expression and communication. Traditional garments like the rebozo and huipil blend indigenous, European, and mestizo influences, creating a vibrant and eclectic fashion scene. Fashion serves as a form of cultural expression, preserving heritage and resisting global homogenization. Fashion communication in Mexico emphasizes social status and identity, with events and social media platforms playing crucial roles in showcasing designs and connecting communities.

Osei-Poku et al. (2018) investigated the collaboration between clothing and textiles institutions and the industry regarding curriculum development and student training from the perspectives of respondents. Again, the study was to find out if efforts to establish collaboration between clothing and textile institutions and the industry which are based on theories/models or standardized practices. Purposive sampling technique was used for the study. Data for the study was collected using interview with semi-structured interview guide and observation. The sample size for this qualitative study was twenty-two (22) made up of two categories of respondent. It was made up of respondents from both the academia and industry. The study found that, as far as student training is concerned, respondents considered industrial attachment as the main and beneficial means of collaboration between the clothing and textiles institutions and the industry. Current efforts to establish collaboration between the two bodies around student training are not guided by standard practices or models. Implications of the outcome of the study as well recommendations for action are provided.

Quarcoo et al. (2022) examined the availability of resources for Teaching and Learning Clothing and Textiles in the Senior High Schools in Ghana. The input component of Stufflebeam's Context, Input, Process, Product Model (1971) formed the framework of the study. The research was approached qualitatively. A multistage sampling procedure was used to sample six regions and eighteen schools offering Clothing and Textiles in Ghana. An observation checklist was used as a data collection instrument. The study found that, majority of the schools had some measuring, marking, cutting, and sewing tools but in minimal quantities and obsolete while majority did not have most pressing tools and reference materials. Nine out of the eighteen schools had a reference material or the other. It is recommended that; Ministry of Education and Ghana Education Service should provide adequate and modern facilities for the implementation of Clothing and Textiles in the Senior High schools.

Dzikite et al. (2016) explored ICT software that had been integrated in teaching and learning in Textiles, Clothing and Design programmes. The study made use of the qualitative approach and intrinsic case study design to generate the necessary data. The participants of the study were purposively and quota sampled from the Textiles and Clothing department comprising seven lecturers, two ICT technicians and thirty-two students. Three main methods were used to collect data namely in-depth interviews, focus group interviews and observations. The data were analyzed for content using thematic analysis after coding. Among the major findings of the study were that there were no specific ICT software packages acquired by the university for the Textiles, Clothing and Design programmes. Instead, general design related software programs such as CorelDraw, Photoshop and Mac Paints were integrated in teaching and learning. Among the conclusions emanating from the findings were that the Textiles and Clothing programmes suffered serious shortage of suitable subject-specific ICT software to facilitate the teaching of practical components thereby compromising the effective skill acquisition in relation to ICT among students. The study recommended that the Textiles and Clothing department should align programmes to ensure the integration of subject-related educational ICT hardware and software like Gerber or Lectra in all modules of the programmes.

Umar et al. (2020) examined the use of Information Communication Technology (ICT) in teaching and learning of clothing and textiles using modern technology to improve teaching and learning. Steps were set

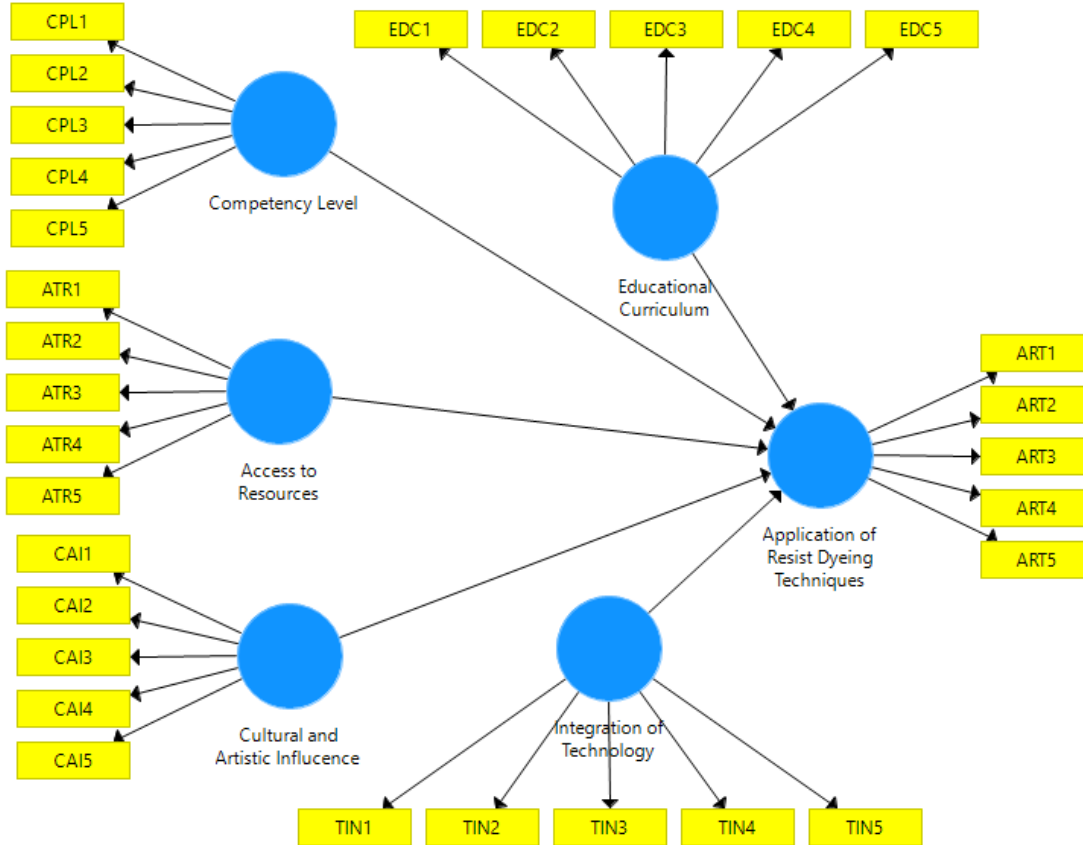
for easy delivering of teaching students through collection, identification of materials needed for construction of textiles clothing such as, the design of the material to be sewn, tools needed (needles, matching threads, type of opening, scissors, tape for body measurement), cutting of the material (fabric), sewing and displaying of the garment. The student's population for this study was one hundred and seventy-three (173), there was no sampling because the population was manageable (NCE 1 students) divided into three groups and patterns were drafted on their various groups with teacher's guidance. Each step was snap using photographic camera so that subsequent set of students that will come will use the same steps projected with lecturer as a guide in teaching and learning. Findings revealed that ICT such as computer and snap photographs were used in teaching and learning of clothing construction in F.C.E, (T) Gombe to improve learning in the area of the study. It was recommended that, there should be a computer projector in the clothing laboratory where students will be viewing the steps, starting from measurement up to construction stage with the help of the teacher to improve the formal way of teaching.

The study was guided by the theory of interest propounded by Dewey (1913). Dewey defines interest as the psychological state that arises when individuals perceive their self-expression to be linked to the interaction with a specific object or idea. In Dewey's work, 'Interest in Relation to the Training of the Will,' he asserts that genuine interest in education is the result of identifying oneself with an object or idea through action. This identification occurs because the object or idea is deemed necessary for the maintenance of self-expression. Simply put, Dewey argues that students develop an interest in a particular object, be it a fact, concept, or expression, when they consider it so crucial that their self-expression relies on interacting with it—absorbing it physically or psychologically. Failure to comprehend and engage with this object would hinder their ability to become the individuals they aspire to be. He also said that, it is the emotional dimension of interest that brings pleasure through engagement in activities that are increasingly complex, significant, and personally meaningful. This results in a sense of fulfilment, personal satisfaction, and overall well-being. Therefore, Interest is conceived as encompassing distinct situational and individual facets that are employed to identify and measure interest. This study focuses on the effect of resist dyeing technique on contemporary fashion design and textile art among students of public universities in Nasarawa state. Even in the absence of a teacher, students can practice various motifs of their choice, apply them to fabrics as designs, and dye them for personal use or income generation.

Methodology

The study adopted a causal research design in examining the existing cause-and-effect relationship between study constructs. The population of the study was all 80 students of Nasarawa state University and 20 students of Federal University of Lafia enrolled in fashion design skill acquisition programme offered at the Entrepreneurship Development Centre (EDC) in both institutions. The census method was therefore, used, in the selection of study respondents. A structured questionnaire was administered as the research instrument in the collection of the views and opinions of sample respondents. The data obtained was then analysed with the use of Partial Least Squares Structural Equation Modelling (PLS-SEM). The specified path model for the study is shown in figure 1.

Figure 1: Specified Path Model for the Study



Source: SmartPLS Output.

Results and Discussion

The analysis carried out was conducted in two main stages: an assessment of the measurement model, involving reliability and validity tests, followed by the estimation of the structural model. In measuring reliability, indicator reliability, as well as test of internal consistency were carried out. Table 1 contains computed factor loadings used for the determination of indicator reliability. Reliability in this case was interpreted based on a threshold of 0.7. Therefore, factors with loadings less than this value were removed from the model.

Table 1: Outer Loadings

| | ATR | ART | CPL | CAI | EDC | TIN |
|------|-------|-------|-------|-------|-----|-----|
| ART2 | | 0.753 | | | | |
| ART3 | | 0.916 | | | | |
| ART4 | | 0.917 | | | | |
| ART5 | | 0.823 | | | | |
| ATR3 | 0.831 | | | | | |
| ATR4 | 0.939 | | | | | |
| ATR5 | 0.863 | | | | | |
| CAI1 | | | | 0.912 | | |
| CAI2 | | | | 0.927 | | |
| CAI3 | | | | 0.850 | | |
| CAI4 | | | | 0.712 | | |
| CPL1 | | | 0.851 | | | |
| CPL2 | | | 0.943 | | | |
| CPL3 | | | 0.870 | | | |

| | | | |
|------|-------|-------|-------|
| CPL4 | 0.879 | | |
| CPL5 | 0.906 | | |
| EDC1 | | 0.861 | |
| EDC2 | | 0.946 | |
| EDC3 | | 0.887 | |
| EDC4 | | 0.930 | |
| EDC5 | | 0.913 | |
| TIN1 | | | 0.913 |
| TIN2 | | | 0.888 |
| TIN3 | | | 0.904 |
| TIN4 | | | 0.896 |
| TIN5 | | | 0.916 |

Source: SmartPLS Output.

In addition to reliability, validity tests were carried out, in terms of both convergent and discriminant. In the form, AVE values were examined for model constructs. A common rule is the presence of convergent validity at AVE values of at least 0.5 obtained results, as shown in table 1, confirmed convergent validity for all study constructs as all computed AVE values were found to be above 0.5.

Table 2: Reliability and Convergent Validity

| Construct | Cronbach's Alpha | rho_A | Composite Reliability | AVE |
|--|------------------|-------|-----------------------|-------|
| Access to Resources | 0.853 | 0.871 | 0.910 | 0.772 |
| Application of Resist Dyeing Technique | 0.875 | 0.898 | 0.915 | 0.731 |
| Competency Level | 0.941 | 0.946 | 0.950 | 0.792 |
| Cultural and Artistic Influence | 0.888 | 0.909 | 0.915 | 0.730 |
| Educational Curriculum | 0.928 | 0.932 | 0.949 | 0.824 |
| Integration of Technology | 0.844 | 0.851 | 0.947 | 0.816 |

Source: SmartPLSS Output.

The measure used for discriminant validity was the Heterotrait-Monotrait Ratio (HTMT), results of which are shown in table 1. As a measure of correlation among model constructs, the value of HTMT is recommended not to be high. The study used 0.9 as the maximum limit for the statistic. HTMT values for all construct associations were determined to be lower than this number, with computed values ranging from 0.105 to 0.814. Discriminant validity was therefore, established for the study model.

Table 1: Heterotrait-Monotrait Ratio (HTMT)

| Construct | ATR | ART | CPL | CAI | EDC |
|--|-------|-------|-------|-------|-------|
| Access to Resources | | | | | |
| Application of Resist Dyeing Technique | 0.275 | | | | |
| Competency Level | 0.132 | 0.509 | | | |
| Cultural and Artistic Influence | 0.316 | 0.514 | 0.266 | | |
| Educational Curriculum | 0.105 | 0.700 | 0.157 | 0.205 | |
| Integration of Technology | 0.172 | 0.814 | 0.252 | 0.462 | 0.757 |

Source: SmartPLSS Output.

Table 4 contains the Coefficient of Multiple Determination (R^2) statistic for the estimated path model. The obtained adjusted value of 0.813 indicated that about 81% of changes in the endogenous construct can be attributed to changes in exogenous constructs. It can be seen that most of the fluctuations in the Application of Resist Dyeing Techniques can therefore, be ascribed to fluctuations in the exogenous constructs of the estimated path model.

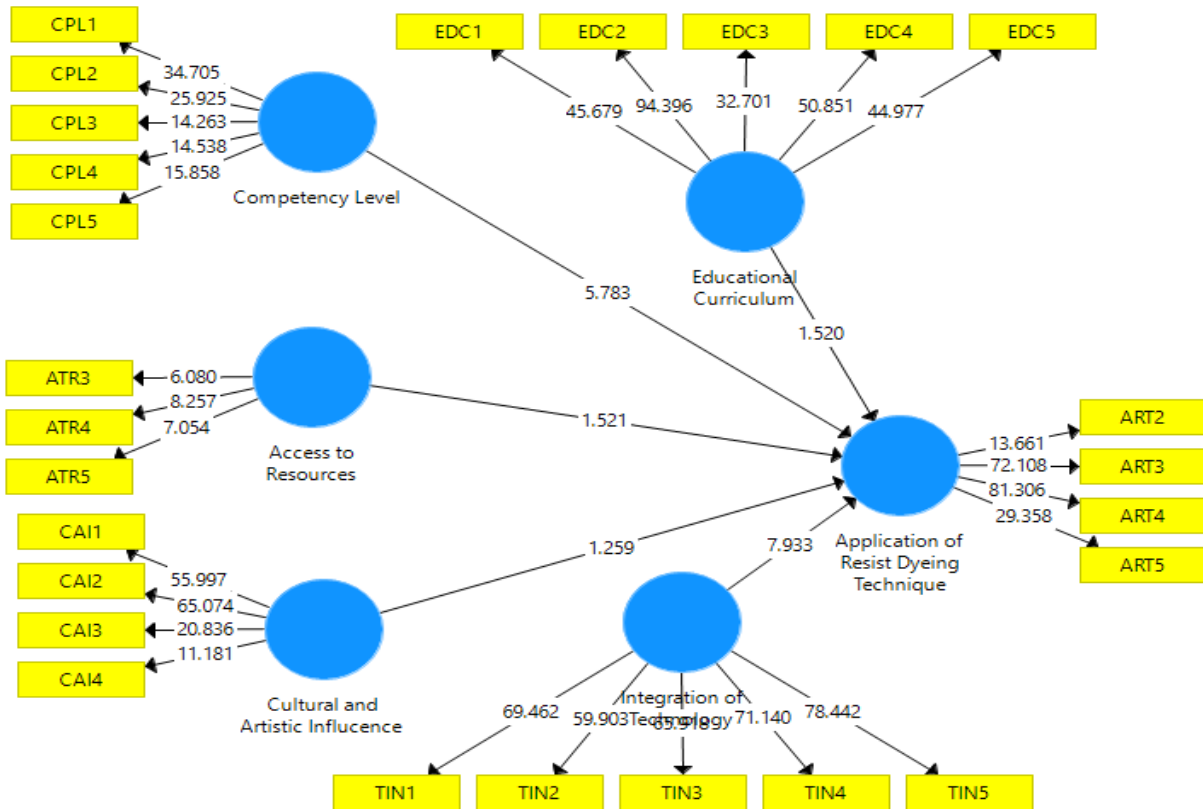
Table 4: Coefficient of Multiple Determination (R^2)

| Construct | R Square | R Square Adjusted |
|---|----------|-------------------|
| Application of Resist Dyeing Techniques | 0.822 | 0.813 |

Source: SmartPLSS Output.

The estimated of the structured model was carried out after the confirmation of reliability and validity of the measurement models. The estimated path model for the study is shown in figure 2, with estimated path coefficients and associated t values. The estimation was done with the SmartPLS bootstrapping procedure involving 5,000 subsamples. All estimated path relationships were positively signed in line with partial expectation.

Figure 2: Estimate Path Model of the Study



Source: SmartPLS Output.

Test of Hypotheses

Estimated R^2 values indicated less than moderate in-sample explanatory power of the estimated model, estimated path coefficients are contained in table 4 with their respective t and p values. All coefficients were determined to be positive and statistically significant outcomes of Application of Resist Dyeing Technique.

Estimated Path Coefficients

| | B | Mean | STDEV | t | P Values | Decision |
|---|-------|-------|-------|-------|----------|----------|
| Access to Resources -> Application of Resist Dyeing Technique | 0.075 | 0.076 | 0.049 | 2.921 | 0.029 | Accepted |
| Competency Level -> Application of Resist Dyeing Technique | 0.271 | 0.273 | 0.047 | 5.783 | 0.000 | Accepted |
| Cultural and Artistic Influence -> Application of Resist Dyeing Technique | 0.077 | 0.083 | 0.061 | 3.259 | 0.009 | Accepted |

| | | | | | | |
|--|-------|-------|-------|--------|-------|-----------------|
| Educational Curriculum -> | | | | | | |
| Application of Resist Dyeing Technique | 0.114 | 0.117 | 0.075 | 12.520 | 0.029 | Accepted |
| Integration of Technology -> | | | | | | |
| Application of Resist Dyeing Technique | 0.636 | 0.627 | 0.080 | 7.933 | 0.000 | Accepted |

Source: SmartPLS Output.

Test of Hypothesis I

H₀₁: There is no significant impact of competency level on the application of resist dyeing techniques in contemporary fashion design and textile art among students of selected universities in Nasarawa state.

Competency level was estimated to have positive and significant effect on the application of resist dyeing techniques (0.271, $t = 5.783$, $p < 0.05$). The null hypothesis is therefore rejected based on this.

Test of Hypothesis II

H₀₂: There is no significant effect of access to resources on the application of resist dyeing techniques in contemporary fashion design and textile art among students of the selected universities in Nasarawa state.

The outcome of estimation done indicated that the effect of access to resources on the application of resist dyeing techniques was estimated to be positive and statistically significant (0.075, $t = 2.921$, $p < 0.05$). The null hypothesis is rejected in this regard, supporting the conclusion that the access to resources does have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

Test of Hypothesis III

H₀₃: There is no significant effect of cultural and artistic influence on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

The result of the estimation done indicated that the effect of cultural and artistic influence on the application of resist dyeing techniques was positive and statistically (0.077, $t = 3.259$, $p < 0.05$). This provided sufficient empirical evidence for the rejection of the null hypothesis in this regard.

Test of Hypothesis IV

H₀₄: There is no significant effect of educational curriculum on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

The result of the estimation done indicated that the effect of cultural and artistic influence on the application of resist dyeing techniques was positive and statistically (0.114, $t = 12.520$, $p < 0.05$). The null hypothesis is overruled in this regard, supporting the conclusion that educational curriculum does have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

Test of Hypothesis V

H₀₅: There is no significant effect of technology integration on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

The result of the estimation done indicated that the effect of technology integration on the application of resist dyeing techniques was estimated to be positive and statistically significant (0.636, $t = 7.933$, $p < 0.05$). The null hypothesis is rejected in this regard, supporting the conclusion that the effect of technology integration does have significant effect on the application of resist dyeing techniques on contemporary fashion design and textile art among students of selected universities in Nasarawa state.

Conclusion and Recommendations

The study explored various factors influencing the application of resist dyeing techniques among students, revealing key insights into competency levels, resource accessibility, cultural and artistic influences, the educational curriculum, and technology integration. All the exogenous constructs were found to have positive and significant effect on the adoption of resist dyeing among students. The research emphasized the pivotal influence of higher competency levels on the effective application of resist dyeing techniques, advocating for targeted interventions and skill development initiatives. There is therefore the need for targeted interventions to enhance skills and potential of students of fashion design through specialized training programs or focused coursework. Investing in skill development can positively impact the quality of resist dyeing applications, contributing to the overall competence of students in the field.

Additional, access to resources, particularly materials and facilities, significantly impacts technique application, necessitating institutions to ensure adequate access for effective learning.

Cultural and artistic influences were found to enrich students' application of resist dyeing, underlining the importance of embracing diversity in both curriculum and creative expression. In the same vein, the curriculum's role in shaping students' proficiency is crucial, emphasizing the need for continuous evaluation and alignment with industry trends. Incorporating diverse cultural perspectives into the curriculum will enhance students' creative expression and innovation in applying resist dyeing techniques. Institutions or facilitators should encourage students to draw inspiration from various cultural and artistic sources in order to contribute to a more enriched and nuanced approach to their work.

The educational curriculum is identified as a significant determinant of students' proficiency in applying resist dyeing techniques. A well-structured curriculum impacts students' skills and understanding, highlighting its key role in shaping their abilities. Continuous evaluation and improvement of the curriculum is essential to align with industry trends and technological advancements. An integrated curriculum, encompassing both theoretical knowledge and practical application, better prepares students for the dynamic challenges of applying resist dyeing techniques in contemporary fashion design and textile art.

Finally, technology integration was found to function as a transformative catalyst, showcasing its potential to enhance learning experiences and practical applications. Institutions are urged to incorporate technology-driven tools to better prepare students for the evolving landscape of contemporary fashion design and textile art.

References

- Adedotun Amubode, A. (2009). "EVIPI": innovation stimulant in niche market for renaissance of resist dyeing industries. *Journal of Fashion Marketing and Management: An International Journal*, 13(2), 246-255.
- Adedotun, A. A., Kabirat, A. K., & Itunu, A. B. (2015). Consumers' acceptability and creative use of local fabrics as graduation gown for primary school pupils. *Review of Arts and Humanities*, 4(2), 81-89.
- Adeloye, A. A., Ogunduyile, S. R., & Akinbogun, T. L. (2022). Customary practices in African print fabric design process in the Nigerian textile industry. *SCHOLARS: Journal of Arts & Humanities*, 4(2), 32-42.
- Adiji, B. E., & Oladumiye, E. B. (2015). Assessment of handcrafted dyed and printed textile designs in selected cities in South-Western Nigeria. *International Journal of Contemporary Applied Sciences*, 2(3), 17-38.
- Akinbileje, T. Y. (2014). Symbolic values of clothing and textiles art in traditional and contemporary Africa. *International Journal of Development and Sustainability*, 3(4), 626-641.
- Akintayo, W. L. (2013). Knowledge, attitude and practice on the use of personal protective equipment by traditional resist fabrics workers in Abeokuta, Nigeria. *Kuwait chapter of Arabian Journal of Business and Management Review*, 33(856), 1-11.
- Alheri, H. (2014). *Development of resist decorated fabrics for fashionable clothing in some selected parts of Kaduna and Kano States Nigeria* [Unpublished Master's Thesis], Ahmadu Bello University Zaria.

- Ali, R. P. (2007). Studio Practice in vocational education: A case of resist techniques in fabric decoration. *Multidisciplinary Journal of Research Development*, 8(1), 56.
- Amissah, E. R., & Letcher-Teye, S. M. (2018). Artistic and cultural significance of Ghanaian printed fabric designs. *Current Trends in Fashion Technology & Textile Engineering*, 2(4), 77-83.
- Anjana, Nagar. B. & Saurabh (2018). Development of resist dyeing techniques for batik work. *International Journal of Education Resources Technology*, 9 [1] 2018; pp. 55-5. DOI: 10.15515/ijert.0976 4089.9.1.5557
- Arubayi, D. O. (2004). A case study of teaching area preference of home economics part time degree students in Delta state University, Abraka. *Journal of Research and Development in Education (JORDE)*, II(1), 56-62.
- Arubayi, D. O., & Obunadike, J. C. (2011). Problems of teaching and learning clothing and textiles in senior secondary schools in Anambra state, Nigeria. *Studies on Home and Community Science*, 5(2), 113-119.
- Asinyo, B. K., Frimpong, C., & Dowuona-Hammond, D. (2021). Conventional and non-conventional materials in conceptual textile art. *International Conference on Applied Sciences and Technology*. 116-125
- Asmah, A. E., Okpattah, V., & Daitey, S. T. (2016). The innovative wet-dyeing batik t-shirt technique. *International Journal of Academic Research and Reflection* 4(1), 1-9
- Azhar, R., Tuwohingide, D., Kamudi, D., & Suciati, N. (2015). Batik image classification using SIFT feature extraction, bag of features and support vector machine. *Procedia Computer Science*, 72, 24-30.
- Badoe, W., Samadu, K., & Frimpong, C. (2015). Exploration of innovative techniques in printed textile design. *International Journal of Innovative Research and Development*, 4(10), 199-211.
- Banjoko, I. (2000). *Visual arts made easy textbook for schools and colleges*. Lagos: Movic Publishing Company Limited.
- Behera, S., & Khandual, A. (2017). Tie & dye textiles in fashion domain. *Int Engineer Res & Technol*, 6(5), 650-655.
- Belfer N (1972) *Designing in batik and tie dye*. Worcester: Davis Publications.
- Boateng, S., Asinyo, B. K., Howard, E. K., Apau, E., & Seidu, R. K. (2021). Textile art creation as a tool for raising awareness of corruption in Ghana. *Textile & Leather Review*, 4(2), 111-127.
- Brito, K. K. (2002). *Shibori—creating color & texture on silk*. New York: Watson-Guptill Publications.
- Burns, A., & Vuruşkan, A. (2019). Using origami for creative design and pattern development in fashion education. *Tekstil ve Mübendis*, 26(113), 86-96.
- Byfield J. (2002), *The Bluest Hands: A social and economic history of women dyers in Abeokuta (Nigeria) 1890-1940*.
- Choi, W., & Powell, N. B. (2008). The development of specialized knitted structures in the creation of resist-dyed fabrics and garments. *Journal of the Textile Institute*, 99(3), 253-264.
- Cooper, D. R., & Schindler, P. s. (2014). *Business Research Methods (12th edition)*. New York: McGraw-Hill Education.
- Day, T. D. & Rich, C. (2009). A theoretical model for transforming the design of healing spas. *Colour and Platonic Solids. Health Environments Research & Design Journal*, 2(3), 84-107.
- De Bortoli, M., & Maroto, J. (2001). Colours across cultures: Translating colours in interactive marketing communications. *European Languages and the Implementation of Communication and Information Technologies*, 1-27.
- Dereje, D., Liu, J., & Zhou, J. (2013, July). African textile design and fabric arts as a source for contemporary fashion trends. In *2nd International Conference on Science and Social Research (ICSSR 2013)* (pp. 229-233). Atlantis Press.
- Devin, K. (2015). *Purpose of Research*.
- Dewey, J. (1913). *Interest and Effort in Education*. Cambridge, Massachussets Riverside Press.
- Dickinson, K. (2011). *The use of colour in textile design* (pp. 171-191e). Woodhead Publishing.
- Dzikite, C; Nsubuga, Y. & Nkonki, V. (2016). Exploring information and communication technological software integrated in teaching and learning of textiles, clothing and design programmes. a case of one selected university of science and technology in Zimbabwe. *Journal of Research & Method in Education (IOSR-JRME)*, Volume 6, Issue 5 Ver. IV. pp 55-61.
- Eccles, J. S. & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, (53), 109–132.

- Enock, I. S., Asoh, O. B., & Christian, O. O. (2018). Cultural and symbolic interpretation of selected wax print designs on Ghanaian fabrics. *IOJPH-International open Journal of Humanities and Social Science*, 1(1), 12-27.
- Gausa, S., & Abubakar, E. (2015). Tie-dye (Adire) among the Jukun people. *Mgbakoigba: Journal of African Studies*, 4. 1-13.
- Goetz C (2008) *Textile dyes: techniques and their effects on the environment with are commendation for dyers concerning the green effect*. Virginia, USA: Ph.D Thesis, Liberty University.
- Gottfried, A. E. (2019). Academic intrinsic motivation: Theory, assessment, and longitudinal research. *In Advances in motivation science* (Vol. 6, pp. 71-109). Elsevier.
- Guay, F., Chanal, J., Ratelle, C. F., Marsh, H. W., Larose, S. & Boivin, M. (2010). Intrinsic, identified, and controlled types of motivation for school subjects in young elementary school children. *British Journal of Educational Psychology*, 80(4), 711–735.
- Gürses, A., Açıkyıldız, M., Güneş, K., Gürses, M. S., Gürses, A., Açıkyıldız, M., & Gürses, M. S. (2016). Dyeing and dyeing technology. *Dyes and pigments*, 47-67.
- Hann, M. A. (2004). Resist dyeing and patterning: An explanation of alternatives. *The Nordic Textile Journal*. 60-71.
- Hidi, S. (2006). Interest: A unique motivational variable. *Educational Research Review*, 1(2), 69-82.
- Hirschler, R. (2010). Electronic colour communication in the textile and apparel industry. *Review of Design Innovation and Strategic Management (or Redige)* 1, 43-61.
- Hur, E., & Cassidy, T. (2019). Perceptions and attitudes towards sustainable fashion design: challenges and opportunities for implementing sustainability in fashion. *International Journal of Fashion Design, Technology and Education*, 12(2), 208-217.
- Hwang JY (2020) How fashion designers think: the influence of cultural value in the creative design process. *J Fashion Technol Textile Eng 8:1. Volume 8*
- Jett, S. C. (1999). *Resist-dyeing: A possible ancient transoceanic transfer*. New England Antiquities.
- Juniati, N. (2018). *Indonesian tie-dye exploration with fabric manipulation*.
- Kokko, S., & Räisänen, R. (2019). Craft education in sustaining and developing craft traditions: Reflections from Finnish craft teacher education. *Techne serien*, 26(1), 27-43.
- Lai, C. C., & Chang, C. E. (2021). A study on sustainable design for indigo dyeing color in the visual aspect of clothing. *Sustainability*, 13(7), 3686.
- Lasisi, L.A., Oligbinde, S.R., D.S & Adetona, S. A (2022). Cultural significance of adire fabrics for contemporary Nigeria interior design. Volume: 8, Issue: 7. DOI: 10.36713/epra2013SJIF Impact Factor 2022: 8.205ISI Value: 1.188
- Liu, M., Pu, X., Cong, Z., Liu, Z., Liu, T., Chen, Y., & Wang, Z. L. (2019). Resist-dyed textile alkaline Zn microbatteries with significantly suppressed Zn dendrite growth. *ACS applied materials & interfaces*, 11(5), 5095-5106.
- Mafuwane, B. (2012). *Research design and methodology*. University of Pretoria.
- Malika, N. & Borodina, M. R. (2023). Functional elements of textiles in the modern interior of hotel and country houses. *Innovations in Technology and Science Education*, 2(10),164-168.
- Mateo, A. (2024). Influence of cultural diversity and identity on fashion expression and communication in Mexico. *International Journal of Fashion and Design*, 3(1), 1 – 11. <https://doi.org/10.47604/ijfd.2387>
- Nurhaida, I., Noviyanto, A., Manurung, R., & Arymurthy, A. M. (2015). Automatic Indonesian's batik pattern recognition using SIFT approach. *Procedia Computer Science*, 59, 567-576.
- Obinnim, E. & Pongo, N. A. (2018). Competency training models and the teaching of apparel patternmaking in Ghana. *International Journal of Vocational Education and Training Research*. Vol. 4, No. 2, 2018, pp. 48-57. doi: 10.11648/j.ijvetr.20180402.11
- Ogunduyile, S.R. (2007) Indigo dyeing as a craft among the Yoruba 's of Southwestern Nigeria. *Journal Nigeria. Crafts and Technique*. Federal University of Technology, Akure Nigeria.
- Osei-Poku, P., Osei, J., Adjei-Boateng, E. & Kofi, H.E. (2018). Curriculum development and student training: a shared responsibility between clothing and textile institutions and their industry. *British Journal of Education*, Vol.6, No.5, pp.9-17.



- Quarcoo, R., Komla, A. M. E. & Senayah, W. K. (2022). Available Teaching and Learning Resources for the Implementation of Clothing and Textiles Curriculum in Senior High Schools in Ghana. *Literacy Information and Computer Education Journal (LICEJ)*, Volume 13, Issue 1, pp. 3678-3683.
- Raumer, A. (2022). *Ancient resist dyeing techniques: ikat & tie-dye*. Retrieved from <https://www.fabricsight.com/blogs/posts/ancient-resist-dyeing-techniques-ikat-tie-dye> Retrieved 10/09/2023
- Saheed, Z. S. (2013). Adire textile: A cultural heritage and entrepreneurial craft in Egbaland, Nigeria. *International Journal of Small Business and Entrepreneurship Research*, 1(1), 11-18.
- Saiyed, S. S., & Reena, B. (2016). Engineered ikat textile of gujarat-a design *Intervention. Land, Labor, and the Port. Textile Society of America's 15th Biennial Symposium. Savannah, GA.* 434-443.
- Sawitri, S., Prasetyaningtyas, W., Syamwil, R., Kusumastuti, A., Pratiwi, A., & Harsari, S. (2020). Decorating fabrics by applying tie and dye technique in Patemon Village of Central Java. *In Journal of Physics: Conference Series 1446* (1).
- Siemens, G., & Downes, S. (2005). Connectivism and connective knowledge: Essays on meaning and learning networks. *National Research Council Canada*.
- Sinurat, M. (2023). Impact of the fashion and design industry on social economic development in Indonesia. *International Journal of Fashion and Design*, 2(1), 43-53.
- Sun, L., & Zhao, L. (2018). Technology disruptions: Exploring the changing roles of designers, makers, and users in the fashion industry. *International Journal of Fashion Design, Technology and Education*, 11(3), 362-374.
- Su-qiong, L., Wei-dong, G., Wei, X., Ming, G., & Hui-e, L. (2016). Tie-dye technique and pattern features. *Indian Journal of Fibre & Textile Research (IJFTR)*, 41(2), 180-187.
- VanStan, I. (1957). *A Peruvian ikat from Pachacamac*. *American Antiquity*, 23(2Part1), 150-159.
- Wang, H. (2005). Exploratory study of the origin of the ancient ikat dyeing technique and its spread in China. *Journal of the Textile Institute*, 96(2), 105-108.
- Wormington, S. V., Corpus, J. H., & Anderson, K. G. (2012). A person-centered investigation of academic motivation and its correlates in high school. *Learning and Individual Differences*. 22(4), 429-438.
- Wright, A. (1998). *Beginner's guide to color psychology*. London, England: Color Affects.
- Wright, A. (2008). *How it Works*. Retrieved from <http://www.colour-affects.co.uk/how-it-works> Retrieved 24/8/2023.
- Yadav, B., Dahiya, R., Kundu, P., & Sabharwal, K. (2012). Propagation of tie and dye: An art of royalty among rural women. *Asian Journal of Dairying and Foods Research*, 31(4), 314-317.