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"ACCIDENTAL DESIGNS": ITS IMPACT ON PUPILS COMPREHENSION

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ABSTRACT: *The drive of this quasi-experimental erudition is to appraise the overall effect of accidental art on pupils' hypothetical (academic) attainment in textile design subjects. Participants were selected from two institutions of higher learning matriculated pupils' subjects (batik and tie-dye) and matriculated pupils (batik), then divided into groups. The control groups were taught using orthodox methods of instructing textile design topics, while the same content was given to experimental groups using intensive (imaginative extract) accidental artwork. Pre- and post-tests were given to all groups. The mean score comparison revealed a significant difference in the attainment scores of the experimental over the control groups. It is thus recommended that pupils be given ample opportunity to be betrothed in accidental art instructions in the two schools (higher learning). This entails that the administrations of the schools supply their workshops with all devices/tools required for accidental artwork to be efficiently implemented.*

KEYWORDS: Textile design skills, Accidental art, Textile concept, Textile instruction.

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INTRODUCTION

From the start of the 16th century to date, educationalists (artists) and scholars have calculated the worth of "accidental art" (creative designs attained through imaginative extraction/inadvertent means) works of art and its important representations in aesthetic creative pedagogy, such as Textile designs and cross-stitch translations. Multiple schoolings showed that (accidental) inadvertent artwork confers innumerable advantages, including developing robotic skills and procedural knowledge, as well as understanding particular ideas and philosophies (Schwichow, Zimmerman, Croker & Harritg, 2016; Hinneh, 2017). In support of "accidental art" work in the creative pedagogy, erudite Robert (2008) designed a booklet (mirror repeated stenciled designs) of high-quality accidental art activities in textiles designs, in which she stated, "Pupils attain a deeper level of understanding by finding things out for themselves and by trialing with techniques and schemes that have enabled the secret of our bodies, our environment, and the whole universe to be inadvertently discovered."

Accidental artworks have been able to promote pupils' positive attitudes and boost motivation for effective learning in creative pedagogy, as described by Okam & Zakari (2017). Accordingly, a positive brashness toward the importance of accidental artwork implicitly affects pupils' success in creative pedagogy (Hinneh, 2017).

Accidental art has been shown in some erudition to help improve communication skills of pupils to solve glitches in dramaturgical circles and thus become more enthused in creative pedagogy (Woolnough, 1994; Ogboli, 2017). In addition to this accidental artwork reassures and augments pupils' interest in creative quests and it is an engaging subject. As a paradigm, when pupils engage in idea pursuits, they see that accidental art/design is applied creative instruction and not just theories and rules.

Studios/workshops (accidental art) play a significant role in creative pedagogy (Hofstein & Mamlok-Naaman, 2007; Ogboli, 2023). In the didactic progression, studio/workshops can be used to develop technical symbolizations and create models to test suggestions. Studios/Workshops also help in understanding the variance between observation and presentation of statistics (Lawson, 1995). In support of this fact, it is documented that "Accidental art activities appeal as a way of allowing pupils to learn with understanding and, at the same time, engage in a process of creating new knowledge by doing art" (Tobin, 1990).

"Accidental art" experiments have vital importance in the erudition of all creative leitmotifs (Textiles, Graphics, and Ceramics).

Erudite Ogboli (2023 has posed a conflicting view to the advantages of studio-based instruction) and Abrahams and Millar (2008). They posit some weaknesses of studio-based instruction as being an unproductive schooling method and not being able to represent postmodernist (technological) inquiry properly. Rather, this should be taught through direct lecturing. Also, Hodson (1990) appealed that "accidental art" work may be designated in a way where pupils find out that studio works assigned cannot be imitated with the conformist's (traditional) approach of the instructions given, which means that they do need to use an inadvertent approach (motif design) that allows for accidental creativity or cognitive thinking to process the information. Thus, accidental artworks are not a waste of time, misperception and counterproductive ( ).

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In light of the Nigerian vision to progress as a nation and to invest in its youths in the hope of becoming among the high ranks in textile designs, decorative intertwining, creative facilities, cross-stitches, and fashion art. The country has technologically advanced creative schooling and reinvigorated the institution of more resourceful schools. In an effort to work in the direction of achieving the vision, the Nigerian government, through centers of art and culture, cyclically encouraged art exhibitions, particularly for the youth, which has brought about radical changes in its education system in terms of pupils' matriculation into creative schools while placing an emphasis on developing 21st-century skills and preparing pupils to enter the modern market (Ogboli, 2017; McKnight, Yarbro, Graybeal & Graybeal, 2016).

The instruction and learning process is a complex one that involves many aspects, which contributes to its success. One of the processes is the method of conveyance and practices used in the pedagogical cycle by the instructor.

In Nigerian public and private schools, boys and girls are not segregated instructionally. Thus, the selection of the participants/curricula to include in the erudition was based on the availability of the pupils and the disposition of instructors to liaise in collecting our statistics.

Having said that, this erudition focuses on teaching practices used inside the pedagogical cycles, specifically those of matriculate (part one) female pupils within two institutions in the city of Borno State, Nigeria.

The verdicts of the erudition may be useful in assisting teachers all over Nigeria in designing and planning their studio-based instruction to achieve the highest potentials of teaching and learning through the operation of "accidental art."

Research Questions

Accordingly, the current erudition will be guided by the following main research questions:

1) Is there any statistical difference between the studio-based learning attainment of pupils taught textile designs using accidental art activities and those taught using traditional composition/lecture?

2) Is there any data difference between the studio-based learning attainment of batik and tie-dye pupils taught using accidental art activities?

3) Is there any statistical difference between the studio-based learning attainment of batik and tie-dye pupils taught using traditional composition/lecture?

Regarding a hesitant answer for these erudition questions, the following null hypotheses were raised and tested at the 0.05 level of significance.

1) Is there a significant difference between the studio-based learning attainment of textile design using accidental art activities and those taught using traditional composition/lecture?

2) There is no significant difference between the studio-based learning attainment of batik and tie-dye pupils taught using accidental art activities.

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3) There is no significant difference between the studio-based learning attainment of batik and tie-dye taught using traditional composition/lecture.

LITERATURE REVIEW

Transnationally, schooling has developed from teacher-centered learning to student-centered learning that teaches pupils how to take accountability for their own learning and become more self-determined. Many teachers are still orthodox in practices such as direct lecturing, strict use of handouts, textbooks as the only reference, and rarely extend their teaching to make it pertinent to real-life scenarios. As posited by erudite Ogboli (2023) and Yore (2001), this does not place any importance on the development of critical thinking legerdemain and whole concepts that are important to studio-based literacy. On the other hand, Cobb, McClain, de Silva Lamberg and Dean (2003) noted that "Design experiments have both a pragmatic bent and theoretical orientation developing domain-specific theories by systematically learning those forms of learning and the means supporting them."

The goals of using accidental art are to improve pupils' understanding, develop their dexterity in manipulating artistic conicities to solve challenges and understand the art by replicating the actions of inventors. Ogboli (2019) and Sotiriou, Bybee and Bogner (2017) acknowledged that "while solving an artistic iconicity's challenge, a pupil should act like an inventor and follow inventors' maneuvers."

According to Otobo & Bango (2021) and Dillon (2008), there are many reasons for accidental art activities (studio-based learning) for imaginative challenges in schools. Some of the reasons are to encourage accurate explanations and metaphors to change theories into real-life applications, to keep the interest of the pupils in procedural teachings and to promote a common-sense and reasoning method of thought. Ogboli (2023) and Bryson, Millar, Joseph & Mobolurin (2002) maintain that accidental art helps to improve pupils' studio-based knowledge.

Effectiveness of Accidental Arty Work

It is generally reasoned that accidental artwork is crucial in metaphorical (symbolic) teaching and learning in the creative pedagogy and that good eminence studio-based work helps develop pupils' understanding of imaginative spatial processes and concepts (Otobo, 2023; Jakeways, 1986). Though whether this has an effect on the attainment scores of the pupils is still under investigation.

In a learning study over a duration of eight weeks on a group of 40 matriculated pupils of college of education Maiduguri, from two different classes selected through purposive sampling, it was shown that pupils who were instructed through inquiry-based learning achieved higher scores than the ones who were instructed through traditional (orthodox) methods (Abdi, 2014).

Several eruditions appraised the role of accidental artwork (unplanned artistic composition) on student's attainment and investigated many aspects of the quality of the accidental artwork, such as the design of the task given in terms of encouraging pupils to make links between the traditional, theoretical and accidental art sides.

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An erudition steered on a sample of 20 studio-based teachings involving accidental art in English secondary schools. The results showed that the accidental work supported the creation of a new product that is more attractively rendered than the traditionally (orthodox) directed teaching in that it kept pupils intrusive on the tasks and doing the hands-on work. Though, accidental work was proven less effective in getting those pupils to make a fitting together between perception and application in the studio-based teaching and reflect on their statistics (Otobo & Bango, 2021; Abraham & Millar, 2008). The erudition found that there was insufficient proof that the people who design these activities for the studio/workshops take linking concepts to observables into consideration.

A suggestion that pupils' thoughts should be enthused prior to starting any accidental artwork by providing them with some background information on what it is that they are investigating (Abdi, 2014; Millar, 2004). Also, the task design should steer the pupil's imaginative configuration initiative and efforts to make links between the two domains of knowledge. Thus, art teachers should be proficient based on the most recent research instructions to amend their practices and put forth more time and effort on art concepts with the natural world (Jokiranta, 2014).

Nonetheless, one should keep in mind that the criticism from instructors of studio-based teaching is a vital source of information about its value. In previous teachings, they mentioned that studio-based work is vital for learning skills but there are certain challenges they faced, such as a lack of materials needed for the required manipulative activity experiment, insufficient information for carrying out the experiment, insufficient technique followed during the experiment, and a lack of information about the steps that should be followed for the attainment of accidental art (Aydogdu, 2015; Otobo & Bango, 2021).

Crafty or Accidental Artwork

Erudite Sotiriou, Bybee, and Bogner (2017); Ahmed & Haruna, (2021) On the other hand, it is alleged that traditional (orthodox) artwork focuses on operational terminology and allows pupils to see what is happening during design experimentations; in addition, pupils may follow the instruction oral or written in the manual step by step, which will not give the pupils the chance for creativity and innovation and cannot develop their cognitive skills. If pupils simply follow the studio manual during trials without co-opting it to real-design realization, then the method will be of no value.

Some instructors showed doubts regarding the effectiveness of accidental art in teaching operational knowledge. For example, Hodson (1991) states that "As practiced in many schools, it [accidental artwork] is ill-conceived, thwarting and unproductive. For many students, what goes on in studios/workshops contributes diminutively to their art pedagogy…" At the root of the challenge is the unthinking of the studio/workshop."

Some pupils show similar doubts about the effectiveness of accidental work in pupils' learning of artistic translations, as was found by Woolnough and Allsop (1985), Osborne (1993), and Ogboli (2019). The reason for such criticism by pupils is that accidental artwork is ineffective for learning a concept or idea. According to Millar (2004), one important condition for the success of inquiry-based learning is that the learning objectives should be clear and concise and easy to follow by the pupils.

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Erudite Solomon (1990) mentioned a scenario where a pupil in the medical field is exposed to his first X-ray (photographic art composition) picture and cannot decipher the sense of it. Lecture alone, without accidentally picturing identities (an X-ray picture), made it difficult for him to comprehend the results. When finally combining both the theoretical and accidental artwork, everything made more sense to the pupil. Thus, it can be concluded that in the scientific field accidental art and theoretical delivery are intertwined and cannot be separated.

Accidental Artwork on Batik and Tidying

The subjects of the "batik" (wax/starch resist) method and "tidying" (tidying resist and stitching) methods are important areas of specialization in textile design that appraise the design structure, composition, configuration of instrument, and the interaction between elements of design. They enable pupils to understand what happens when these design elements operate around them. But generally, they are difficult subjects to learn due to the great amount of ingenious dexterity needed about materials and their instruments, which might dampen pupils from studying these subjects. To understand the manipulations of instruments and tools of all materials and the chemical changes that take place when they interact, many accidental art applications and experiments must take place in the course of studying these two challenging subjects.

Although studio-based work is a core component in the subjects of batik and tidying, some previous research argued that

1) Orthodox (conventional) studio-based work or activities fail to engage pupils in cogitations and do not promote the development of skills needed to understand batik (wax resist) manipulations effectively (Holstein & Lunetta; Singer, Hilton & Schweingruber, 2011; Ogboli, 2023).

2) If studio-based experimental (operation) work is applied traditionally, then only small group of pupils will be involved in this work (Singer et al., 2006; Ogboli, 2017)

3) Pupils' discussion during the studio-based work is mainly centered on the procedures needed to carry out the experiment or how to manage studio equipment (Russell & Weaver, 2011; Ogboli, 2023).

Once it comes to group work in experimental activities in batik and tidying, the kind of interaction between the members of the group will influence the quality of the group work and level of understanding of the experiment, and to some extent the anticipated outcomes. During studio-based operation (experiments), it is important that every pupil has the opportunity to apply what he/she has learned to future tasks to improve his/her learning (Russell & Weaver, 2011; Sandi-8Urena et al., Ogboli, 2023).

We model progressively sophisticated and powerful iconicities (symbols) of the world by acting on them in the light of current understanding (Piaget, 2013). If one considers that Piaget is correct, then accidental artwork is imperative in understanding creative art in general. The main role of accidental art is to give support for pupils in their learning and to make a link between the domain of real objects and observable facts on one hand and the domain of concepts (designs) on the other (Bryson et al., 2002; Otobo, 2023).

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Methods Schooling, Learning, Assessment

There are varied methods of teaching, learning and assessment used in teaching art curriculum in Nigerian higher institutions. According to Edgar Dale's cone of knowledge (Dale, 1969), shown in Figure 1 below, people learn, retain and recall 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, 70% of what they say and write, and 90% of what they say as they do a thing.

Based on Dale's pinecone, the least effective methods of learning involve learning from information accessible through textual and articulated symbols, i.e., reading and hearing, while the most effective methods involve direct, purposeful learning experiences, such as hands-on or field knowledge (Anderson, n.d.). The experiences in each phase can be mixed and are interconnected, which promotes more reminiscent learning. Direct, purposeful experiences illustrate reality or the closest things to run-of-the-mill life. Dale's pine cone of experience proposes that when choosing an instructional method, it is important to involve pupils to maximize their information retention.

Figure 1: Edgar Dale's cone of experience (Dale, 1969)

People generally remember		People are able to Learn Outcome
10% of what they read	**Read**	Define Describe List Explain
20% what they hear	**Hear**	
30% of what they see	**View images Watch videos**	Demonstrate Apply practice
50% of what they hear and see	**Attend exhibit watch a demonstration**	
70% of what they say and write	**Participate Hands-On Workshop**	Analyze Design Create Evaluate
90% of what they say as they do things	**Simulate, Model, or Experience a Lesson**	

The above proposed facts and keeping the studio (classroom) get-up-and-go elevated, in-studio activities/projects are mainly done in small groups. As a starting phase in this direction, specific techniques and ideas are accessible through demonstrations and hands-on experiences of the lesson's core skills of the assigned projects. Thus, and to arouse "doing the real thing" and to maximize chances to share what they envisioned and captured, group members are encouraged to articulate and symbolize what they know and are able to do through the process of demonstrating and explaining them to others. This accidental art technique aims to help reinforce lesson concepts and encourage pupils to take proprietorship of the erudition. As a result, it will help students connect with the lessons learned in the pedagogical cycle.

This study seeks to make a contribution to the teaching and learning process of textile design subjects such as batik and tie-dye by shedding light on pupils' assignment as an essential aspect of the teaching and learning process. Studio-based fields should have their purposes made explicit to pupils if they are to benefit fully from them. Otherwise, pupils would see artwork

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merely as a break from the humdrum activities of speaking, listening and writing. Hence, hands-on learning is a key to the development of pupils' knowledge and skills through the tethering of accidental artwork and philosophy together. Adopting accidental artwork is useful for teachers in Nigerian schools. It would help to teach beyond the long-standing (unadventurous) topics in the art curriculum by engaging pupils in the learning process. Many schools could also enhance their art curriculum through the provision of accidental artwork along with the provision of hypothetical knowledge using traditional teaching methods.

METHODOLOGY

Research Design

The quasi-experimental research design was used. Quasi-experimental research is conducted in field settings in which random assignment is conceivable or absent and is often conducted to appraise the effectiveness of a treatment or a didactic intervention (White & Sabarwal, 2014; Prince, Jhangiani & Chiang, 2015).

The participants were divided into control and experimental groups for batik and tie-dye subjects. A pre-test and post-test instrument was adopted to assess the effect of accidental artwork on matriculated university pupils' understanding of textile design (Campbell & Stanley, 1963; Ogboli,2023). The batik group was divided into two subgroups, while the tie-dye group consisted of one group of pupils. The experimental and control group comprised 49 students each.

Preceding dividing the pupils into control and experimental groups, all participating pupils were pre-tested to determine their level of textile design content understanding. This was done to ensure similarity/homogeneity of two groups before the intervention. Thus, pupils in both control and experimental groups had the same hypothetical level and pretest score. For a period of three weeks, the control group students (batik and tie-dye) were taught using the orthodox method, while the experimental group pupils (batik and tie-dye) were taught using the intensive accidental art method (the intervention), as shown in Table 1. Thus, for the experimental group, all the teaching hours were taught in the studio (classroom).

After the intervention was complete, the post-test was conducted to measure the pupil's attainment. The statistics were collected and statistically analyzed to explore any significant differences in the attainment mean score of the control and experimental groups. Table 2 illustrates the study design.

Table 1: Orthodox Versus Modern/Hand-On Approaches in Teaching Textile Design

#	**Orthodox (conventional) way of instruction**	**Accidental Arty method of instruction**
1	Relies on textbooks/lectures	Relies on hands-on materials/imaginative extract approach
2	Representation of materials is from parts to the whole	Representation of materials is from idea (formation) parts/whole
3	Assessment is a separate activity	Assessment is an integrated activity
4	Emphasis on basic skills	Emphasis in big ideas

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5	Testing is the major means of assessment	Design Portfolios and observation are major means of assessment (Brooks & Brooks, 1999)
6	Use of homeroom for textile instruction	Use of classroom/studio for textile instruction

Table 2: The Pretest and Posttest Design for both Groups

Group	**Control group**	**Experimental group**
Pre-test	Ability regarding textile content understanding	Ability regarding textile content understanding
Duration	Three weeks	Three weeks
Post-test	Change in Ability regarding textile content understanding	Change in Ability regarding textile content understanding

Study Sample

The purpose of this erudition was to appraise the overall effect of accidental artwork on pupils' hypothetical attainment in textile design, specifically Batik and Tie-dye, in two higher institutions in northeast Nigeria. The purposely selected are college of education Maiduguri matriculated students in textile design (tie-dye and batik class) and college education Gausha pupils in textile design (batik class). Table 3 illustrates the erudition sample. The pupils were selected randomly from the classes, ensuring that they had similar hypothetical (academic) attainment levels.

Table 3: Study Sample Distribution

Group	**Batik (group A)**	**Batik (group B)**	**Tie/dye (group C)**	**total**
Control group	13	22	14	49
Experimental group	13	22	14	49

Instrument

In the quasi-experimental erudition, the independent variable was the accidental artwork undertaken by pupils in the studio/workshop, and the dependent variable was the hypothetical (academic) attainment of the participants. All variables were the same (allocated time, curriculum content, activities, tests, etc.). The only manipulated variable is the independent variable. The two different groups (control & experimental) were treated as two sections for the same class. They were allocated the same number of instruction hours on the weekly instruction schedule. On the other hand, both groups were well thought out and treated as if they were members of the same class. Thus, all groups received identical class content and handouts, the same instruction hours and the same instructors. The controlled group pupils were taught by the orthodox/unadventurous schooling method, which is "when pupils learn through memorization and recitation techniques, thereby not developing their altruistic

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thinking, problem solving and decision-making skills" (Sunal, Smith, Sunal & Britt, 1998; Otobo, 2023). On the other hand, the experimental students were taught the same exact curriculum by the same using the modern (accidental art) instruction technique, which can be defined as "the premeditated process of diagnosing challenges, appraising experiments, and distinguishing alternatives, planning inquiries, researching conjectures, searching information, constructing models, debating with peers, and forming coherent arguments" (Linn, Davis & Bell, 2004; Otobo, 2023).

To measure the dependent variable, a test was administered prior to participating in the procedural art activities (pre-test) and after the completion of the activities (post-test). Then a comparison between the pre-test and post-test scores was done to assess the effectiveness of the intervention (accidental art activities). The gained score was of concern to the researchers as an indicator of the gained knowledge, reflected in obtained figures. To achieve such a target, each section had its own experiment with pre-test and post-test based on the curriculum and subject (batik and tie-dye) as follows:

Experiment No 1: Batik / "Elekor" Starch Resist

The batik unit topic "Elekor-Based Starch Resist" aims to cover, illustrate and explain:

That "elekor"-based starch is a slow addition of a stenciled starch design solution onto a piece of fabric (cloth) known as "ekor" (traditional Yoruba-speaking community starch paste), a concentrated starch solution used repeatedly as a stamped design on a piece of cloth. In a broad sense, it is a technique used in industrial textile designs (super-wax print) printing. The difference is that the industrial method uses wax resist, and their designs are not by inadvertent means. In this batik lesson, pupils explain the difference between "elekors" and base. They discuss the role of indicators in the starch method.

- Texts and problems orientation
- Question formation
- Lecture attendance
- Discussion monitoring
- Questions and objective type questions: writing and replying
- Problem solving
- Oral presentation of answers

By way of the experimental group, though they provided the exact content, the pupils were taken to the batik studio (classroom) and were provided with glassware, hand gloves, chemicals, colored dyes, cutting instruments, and all the tools required. After designing the experiment, pupils were asked to carry out the monitored experiments to generate answers to the intended questions.

The pupils' performance in batik elekor was determined by scores obtained by pupils subjected to the test composed of the seven questions concomitant to "elekor fixative research" and recording their results as a pre-test, comparing these results to the one chronicled in the post-test for the same questions as shown in Table 4.

Table 4: The Pre-test and Post-test for First Group of Batik

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#	**The Pre-Test/Post-Test Questions**
	Please read and answer each question carefully (Q1-Q7)
1	Define term crackles translation
2	What is wax volume concentration
3	What is wax resist instrumentation
4	How do you control the "jantting" flows
5	How do you determine light/shading effect in batik
6	Explain the method use for effective batik design
7	Do you contemplate that this method is an essential process to the attainment of effective batik?

Experiment No 2: Batik/wax

Following the same methods and procedure as discussed in the first experiment, pupils were given a lecture on the heat reactions of wax fixative (wax resist batik). The control group was taught through a teacher-centered lecture, where pupils see knowledge as something to be transported to them by the teacher (Zhenhui, 2001; Ogboli, 2023).

On the other hand, the same exact topic, "heat reactions on wax fixative," was taught to the experimental group using illustrations and examples. The lesson covered the following:

- In all batik (motif configuration) change, reactants on wax transmuted into design products by chemical reaction.
- Manipulated heated wax infiltrates and soaks the intended motif in batik translation.
- It is one of the core features of a batik reaction.
- Typically, the heated wax maneuver happens in the form "caracal design," a heated wax tortuous.
- In some cases, heated wax is wrapped, while in other cases, heated wax is unconfined on the exact textile motif.
- If more heat wax is SUPPLIED through the ('jaunting') instrument and then RELEASED, then the reaction is FIXED.

Participants were then assessed via written test before (pre-test) the implementation of accidental artwork. The pre-test and post-test consist of 10 objective questions with two formative questions as shown in Table 5.

Table 5: Pre-test and Post-test for Second Group of Batik Design

#	Please read and chose the correct answer (Q5-Q7
5	Chemical reactions that absorb heat are called-----? a. Homogeneous b. Heterogenous c. Exothermic d. Endothermic
6	Which of the following terms most closely to heat being transferred into the "janthnig" instrument (metal pen)

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	a. Endo the mic reaction b. Franchot c. Nav-slot d. Heat-reaction
7	What kind of wax reaction involves the absolvent of heated wax, leaning to a substance (fabric) feeding solidified cooling? a. Reactant b. Liquid wax c. Anabolic reaction d. Extreme reaction.
8	The heated wax restrains the easy flow of the color substances applied to the fabric motifs is an example of a? a. Catabolic reaction b. Biochemical reaction c. Anabolic reaction d. Accidental “crackles” flow reaction

Experiment No 3: Tie-dye/symbolic motif designs

Through the orthodox method, pupils in the control group were exposed to the needs of symbols (imaginative extract designs) as an image-searching process: manipulated-component-dependent reactions and existing independent-component reactions.

The lesson covered the following:

- What is symbolic design
- Process
- Tie-dye resist design
- Manipulative components
- Dependent and independent components
- Stitching and meshing method
- Color parting techniques
- Self-evaluation

The pupils were then assessed via a written pre-test and post-test containing ten questions, including eight objectives with two formative questions in Table 6. The same exact content and exam were given to the experimental group after they conducted experiments on the topic.

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Table 6: The Pre-test and Post-test Form Tie-Dye Group

#	**The Pre-Test/Post-Test Questions**
	Decide whether each these color reactions are object to accidental tie-dye
1.	What four things needed for an effect into tie-dye process a. Fabric, needles, motif and dying stuff b. Water, sodium, oxidation and gloves c. Threads, sunlight, steaming d. Sunlight, wasting and critic
2.	If traditional (orthodox) dye is used for coloration its adherence is more effective, what do they breathe out? a. Nitrogen b. Oxygen c. Carbon monoxide d. Hydrogen e. Neither
3	What plans are used for producing indigo blue? a. _____ b. _____ c. _____ d. _____ e. Neither of them
4	Explain the process of chemicals dying for fabric coloration? a. _____ b. _____ c. _____ d. _____ e. Neither of them
5	What color is chlorophyll a. Yellow b. Green c. Blue d. Brown
6	What do you understand by traditional dying pit a. _____ b. _____ c. _____ d. _____ e. Neither of them
7	In a light-dependent reaction water and sunlight are needed to create oxygen and _____ a. Carbon dioxide b. Sugar c. ATP d. Chlorophyll e. Neither of them

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8	Sequence the process involved in tie and dye design? a. _____ b. _____ c. _____ d. _____ e. _____
9	Are stitching design representative like a true motif of tie-dye? a. _____ b. _____ c. _____ d. _____ e.
10	State the true characteristic of tie-dye design a. _____ b. _____ c. _____ d. _____ e. _____
	Please read and answer each question carefully (Q11-Q12)
11	Explain the role of sodium carbonate in the dye processing
12	What was the product of design achieved?

Based on the above statistics, the core erudition question-Is there any statistical difference between the hypothetical attainment of pupils taught textile designs (tie-dye and batik) using accidental activity and those taught using the orthodox method of instruction?—will be addressed in this erudition. For this purpose, statistics generated from statistically analyzing the mean scores of pre-tests and post-tests were used to answer the erudition questions.

RESULTS

Prior to performing ANCOVA analysis, the assumption of normality, the homogeneity of variances, and the homogeneity of regression slopes were assessed. The normality of residual assumption was contented based on Shapiro-Wilks's test (p=0.685). In examining the assumption of the homogeneity of variances, Levene's test indicated that the variances were equal (p =0.138) and hence the assumption is met. Finally, the assumption of homogeneity of regression slopes was tested based on the interaction between the covariate (pre-test score) and both independent variables (method and gender). Results indicated that this assumption was met (F=2.826, p=0.0961 one-to-one).

The illustrated statistics in Table 7 and Table 8 are evidence that will be used to answer the erudition questions and the concomitant null hypotheses that were raised and tested.

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Table 7. Descriptive Statistics Post-Test

Subject	Group	Matric	Mean	Std. deviation	N
Tie-dye	Experimental	10	27.0	1,1.272	22
	Control	10	17.14	5.092	22
	Total	10	22.07	6.192	44
		Total	22.07	6.192	44
Batik	Experimental	10	27.14	.949	14
		11	27.08	1.038	13
		Total	27.11	.974	27
	Control	10	17.64	5.213	14
		11	16.92	4.941	13
		Total	17.30	4.999	27
	Total	10	22.39	6.076	28
		11	22.00	6.076	26
		Total	22.00	6.104	54

Table 8: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Degree of Freedom	Mean Square	F (Test Statistic)	Significance	N2 (Effect Size)
Corrected model	2393.219a	4	598.305	45.209	0.000	0.660
	1046.067	1	1046.067	79.043	0.000	0.459
Pre-test	22.106	1	22.106	1.670	0.199	0.018
Group	1486.189	1	1486.189	112.299	0.000	0.547
Subject	3.597	1	3.597	0.272	0.603	0.003
Group*Subject	2.470	1	2.470	0.187	0.667	0.002
Error	1230.781	93	13.234			
Total	51674.000	98				
Corrected total	3624.000	97				

Addressing the first erudition question, "Is there any statistical difference between the hypothetical (academic) attainment of pupils taught art (batik and tie- design) using accidental art activity and those taught using orthodox instructional method?" and testing its related hypothesis, "There is no significant difference between the hypothetical attainment of art pupils taught using accidental art activities and those taught using orthodox instructional method", the results showed a significant difference between the hypothetical attainment of pupils taught (imaginative extract) using accidental art activities and those taught using orthodox instructional method (Table 7 and Table 8).

The ANCOVA results showed significant difference between the hypothetical attainment of pupils taught art (batik and tie-dye design) using accidental art activities and those taught using

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orthodox instructional expository/lecture (F= 89.733, P=0.000, n2=0.496). This outcome designates that there is a highly significant effect of accidental artwork. The effect size is moderated, and thus the hypothesis was rejected.

Regarding the second and third learning questions:

- Is there any statistical difference between the hypothetical attainment of batik and tie-dye pupils taught (imaginative design extract) using accidental art activities?
- Is there any statistical difference between the hypothetical attainment of batik and tie-dye pupils taught using orthodox expository/lecture?

The ANCOVA results (Table 7) showed that there is no significant group-subject interaction effect (F=0.420, P=0.519, n2=0.005). This means that performance of pupils in tie-dye and batik is consistent within control and experimental groups. Thus, the hypothesis is not rejected.

DISCUSSION AND CONCLUSION

The results of our erudition show that there is a positive correlation between accidental artwork and hypothetical attainment of most pupils in art (textile design). The findings are directly in line with previous education findings, such as erudition by Abdi (2014), which enumerated that the experimental groups had a much greater understanding of information covered, exclusively regarding questions that required construction. Instructors were guided to consider how to prepare learning atmospheres in which pupils will be more active and then present these atmospheres to pupils.

In fact, other learning has generated similar results. For example, Hofstein & Lunetta (1982), Hofstein & Mamlak-Naam (2007), and Ogboli (2023) acknowledged that studio-based work plays an important role in art education and also helps in understanding the difference between observation and presentation of statistics. Ogboli (2023) leisurely posits that accidental artwork can motivate pupils and stimulate their interest in teaching and learning.

On the other hand, Ayogdu (1999) and Boyuk et al. (2010) put forward that some instructors have disclinations in regard to studio-based artwork. They mentioned that studio-based activities are vital for learning artwork (batik and tie-dye designs) but there are certain challenges uncounted, such as the lack of affordable materials required for the experiment, insufficient information to carry out the experiment, the techniques followed during the experiment, the glassware, hand gloves, the chemicals needed for the experiment, and finally, what should be done in case of an accident during the experiment.

The erudite of the current erudition acknowledge the importance of these limitations and recommend that they must be thought out and addressed by instructors and school administrators to allow the value of accidental artwork to benefit pupils in attaining higher academic standards.

The erudite recommends that accidental artwork (imaginative design extract) be provided for most of the concepts in batik and tie-dye, as they are considered an applied textile design art. Some concepts cannot be understood if not applied practically. In addition to this, some concepts cannot be applied; thus, more research is needed to simplify imaginative design,

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extract concepts (textile design) in general, and make batik and tie-dye easier and more exciting subjects in particular. This can help pupils become artistically projected and stirred, work harder and understand batik and tie-dye better.

Thus, the erudite suggests that further erudition be undertaken to explore the role of using Information and Communication Technology (ICT) in instructing and learning textile design (batik and tie-dye), perhaps in a way that would explain experiments that are difficult to complete practically in the studio. To ensure the success of accidental artwork, the erudite recommends that the administration of schools supply their schools with all necessary equipment, all studio devices and elements needed to facilitate the accidental artwork for most topics in batik and tie-dye textile design.

Finally, the erudite find it dynamic to allow pupils to (imaginative design extract) design some of their own experiments (student-centered activity), as this ensures they do not just follow instructions from instructors. Teacher-centered instruction can be boring for students and can affect the benefits of accidental artwork.

Limitations of Study

The erudition was limited to two higher institutions and two textile design subjects (batik and tie-dye). In addition, the (erudite) scholars did not have the freedom to choose what to be taught but had to follow the outline of the subjects' curriculum provided by the school. The number of lessons per week also had to be limited to what was scheduled and planned by the school. It may suffer from factors such as being too population-specific.

Compliance with Ethical Standards

All procedures performed in schoolings involving human participation should be in compliance with the ethical standards of the institution and its amendments or comparable ethical standards. Thus, the erudite ensured they obtained consent from the two institutions of higher learning College Education Maiduguri and College Education Gashua in northeast Nigeria to conduct this experimental erudition on assigned pupils. Also, the consent of all individual participants included in the study was obtained.

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Declaration Conflicting Interests

The authors declared no potential conflicts of interest with regard to the learning, authorship, and/or publication of this article.

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