



## **Exploring Leather As Alternative Material For The Production Of Instructional Media For Preschool Education**

**Dr. Asubonteng Kwabena**

Department of Integrated Rural Art and Industry, Faculty of Art,  
College of Art and Social Sciences, Kwame Nkrumah University of  
Science and Technology, Kumasi, Ghana

**Mr. Anini Frank**

Ghana Education Service, Offinso North District Office, Akomadan,  
Ashanti, Ghana

**J.O. Bobie Boahin**

Department of Integrated Rural Art and Industry, Faculty of Art,  
College of Art and Social Sciences, Kwame Nkrumah University of  
Science and Technology, Kumasi, Ghana

***Abstract:***

*The research explores the use of locally tanned leather as an alternative medium for making instructional materials to aid pre-school teaching and learning. Materials usually employed in the production of instructional materials to serve as teaching and learning aid usually, include plastic, wood, paper, clay and plaster of Paris. These materials may be too heavy as found in wood, easily perishable as found with paper, or even too expensive to import from other countries. The researcher employed qualitative research using the descriptive and experimental methods. The principal instruments designed to collect data were observation and interview. Leather was identified to be a convenient material for producing instructional media for preschool education since it has been found to be readily accessible, easily manipulated, remarkably light in weight, and attractive when scorched, painted or dyed in various colours to arouse the interest of children. Leather instructional materials produced were attractive and easy to manipulate by the pre-school children. The instructional materials produced with leather were child-friendly.*

***Keywords:*** *Leather; Instructional Media; Preschool; Education; Teaching, Learning*

**Introduction**

Preschool education is considered as an aspect of education imperative to early childhood development in Ghana. It has therefore been made formal for children before they proceed to the primary school level. Sarpong (2006) explains that preschool in Ghana is the type of education which prepares children towards academic life before the actual formal school education starts at the age of six years. Categorically, preschool covers the initial stages of early childhood education, and it comprises crèches, day care centres, nurseries, and kindergartens. According to Chutima (2005), most child psychologists pay greater attention to the preschool age because this is the most important period when human beings establish the foundation for their subsequent physical, mental, emotional, social and intellectual development as well as their personality.

It must be noted that preschool education is a very important foundation in the lives of children, particularly in today's dynamic society and in a world where more and more parents in both urban and rural areas have less time for their children due to time constraints created by their occupations. Castle (1993) has underscored that preschool education significantly is to give children the opportunity to learn to play together, to share toys, to use their hands, feet and eyes to gain self-confidence, to learn how to keep clean, how to dress and how to use their bodies. Adoption of strategic pedagogical approaches and the exploitation of various instructional materials towards knowledge impartation are therefore prerequisite. Vygotsky, (1978) states that the teaching approach goes under the acronym MAMACHOLASU MA: material; MA: manipulation; CHO: choice; LA: language and SU: support.

Instructional materials play a vital role in teaching and learning at various levels of education, especially at the preschool level where children need to build a strong foundation to ground them firmly for mainstream education. Shankar (1980) has emphasized that playing has been regarded as the heart-beat of early childhood education; therefore, any media employed in the production of teaching and learning materials for educating preschool children should possess characteristics requisite to propel the teaching and learning process. According to Craig (n.d), instructional media for children should attract attention, develop interest, adjust the learning climate and promote acceptance of an idea. These characteristics and expectations can best be

achieved if the materials employed are apt for the production of teaching and learning aids.

It is worth mentioning that instructional materials used in preschool education are usually made from materials that include plastic, wood, paper, clay and plaster of Paris. It has been observed that teaching and learning materials made in plastics are usually imported into the country at high cost to the detriment of the economy of the nation. Additionally, many types of plastic materials involved are not biodegradable when they are disposed off. Wood may be used, but its sources (the forests) are depleted, and consequently, scarce and expensive. Metals are not conducive for instructional materials meant for preschool education because of their weight, toxicity and tendency to injure children. Paper is highly perishable and easily wears out, especially in the hands of preschool pupils. Leather on the other hand is known to possess desirable properties which render it versatile in utility, durable, pliable, bleachable and can be dyed in various colours to attract attention easily (Atiase, 2004). As stated by Boahin (2008) there are various designing and decorative techniques, such as marbling, embossing, carving and scorching, that can be employed to beautify leather

In spite of the suitability and applicability of leather in the production of artifacts that have been empirically known, and the vast natural properties inherent the material, leather is not employed in the production of instructional materials for preschool education in Ghana. It is therefore expedient to explore the feasibility of the Ghanaian local leather as alternative material for making instructional aids to assist preschool teaching and learning process.

Empirically, the World Book Encyclopedia Vol. 12 (1972) (as cited in Boahin; 2008), states that unlike synthetic material, leather is versatile in utility due to its diverse properties. It has durability, workability and beauty that enhances with age. It possesses properties which give it the ability to stretch, to be as flexible as cloth or as stiff as wood and some kinds are thick and heavy. Leather can be dyed and polished until it has a glossy finish. Decorative techniques such as embossing, marbling and coating can be employed to beautify its aesthetic appeal. These inherent abilities of leather give assurance of its endurance to dirt and longevity when in use.

**Materials And Methods**

The researchers employed the descriptive and experimental methods of qualitative research, and the target population comprised leathers, tanners, leather sellers, preschool pupils and teachers. Due to the heterogeneity nature the population, different sampling techniques were employed. Respectively, the locally tanned leathers from Aboabo cluster of indigenous tannery in Kumasi, Ashanti region of Ghana, and Hausa Zongo tannery at Tamale in the Northern region of Ghana were selected purposively for the experiments to ascertain the impact of their varied quality standards as expressed by Asubonteng (2010). Seven sheets of leather from each tannery were used. The convenience sampling approach was used in selecting the Kwame Nkrumah University of Science and Technology (KNUST) Nursery School as a preschool environment for testing the effectiveness of the leather instructional materials designed and produced. Also, the tanners, leather sellers, classes of pupils and teachers at the KNUST Nursery School were selected by the convenient sampling approach for the study. The sample size involved 14 leathers (2.5 square feet each in size), 2 tanners, 5 leather sellers, 6 teachers and 180 preschool pupils.

**Data Collection**

Data collection was done by the use of observation and interview. Firstly, leather markets and tanneries in both Kumasi and Tamale were surveyed to ascertain the availability of the locally tanned leather. Interview and observation guides were designed to make the survey organised and effective. Leather tanners and sellers were interviewed to find out the rate of skin delivery, leather production methods, supply, price range and sales. The tannery processes of leather were also observed critically at the tanneries to note the chemicals employed in the production.

Leathers were then collected from Kumasi and Tamale tanneries and given refining treatment by sanding the flesh side further to get rid of excess flesh toward the removal of odour and impurities associated with the locally tanned leather. They were then soaked in water for 40 minutes to hydrate and become soft. The leathers were then washed, rinsed and stretched on boards (plywood) to dry under the shade and burnished. Some of the leathers were also dyed with suede dyes in bright colours. The instructional materials were designed based on the Ghana Preschool Educational Syllabus to cover numerals, mathematical symbols, lettering, geographical shapes, fruits and vegetables, animals and objects. With supporting materials such as strawboard and adhesive, 40

samples of instructional materials were produced. Acrylic pigments in bright colours were used to paint the surface of some of the pieces. Also, decorative and joining techniques including embossing, pyrography (scorching), shading techniques (hatching and cross hatching), embroidery and sewing were employed for aesthetic enhancement. Wax polish, removal of excess glue and threads were done to ensure good finishing of the teaching and learning aids produced. The final presentations of the items made were paramount to ensure the children's understanding of the concepts and ideas projected.

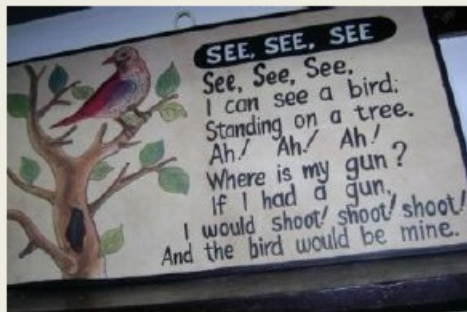
The teaching and learning materials produced in leather were mounted and subjected to test at the KNUST Nursery School to determine their usefulness and effectiveness used by preschool children. The test was conducted in four different classrooms for a period of one term (3 months), and in each case, the teachers used the leather teaching and learning materials to teach while the researchers observed the reactions of the children to gather data. The teachers and some of the children were interviewed face-to-face afterwards with generally open-ended questions to elicit their views and opinions about the instructional materials. These teachers had between 6 to 10 years of teaching experience in preschool institutions and their ages ranged from 30 to 50 years. The children were mostly 3 to 5 years of age.

### **Results And Discussion**

The leather instructional materials produced were tested based on the following qualities as emphasized by Craig (n.d) and Vygotsky (1978): legibility, attractiveness, manipulability, durability, safety in use and fitness for purpose. The teachers employed the teaching and learning materials in Mathematics (addition and subtraction); English Language (identification of letters of the alphabets, formation, identification and pronunciation of words, identification and filling in of missing letters in words); Environmental Science (identification of fruits, vegetables, animals, objects and parts of the human body).

### Legibility

The instructional materials in leather were legible enough to be identified from afar by the children in the classrooms irrespective of the angle they seated. The colours used in painting the surfaces of the leather were bright enough to be seen by all the children in the classroom. The teachers had no difficulty in using the materials to teach the children of such age group. The images were clear enough for the teachers to use to communicate ideas to the children as shown in *Plates 1 (a) and (b)*.



*Plate 1(a): Picture reading and rhymes*



*Plate 1(b): Picture of a girl*

The instructional media were found adequately bold to be seen from afar. Shapes and colours were big and clear enough to be identified, recognized and appreciated by the teachers as well as the children. The children were in love with the bright colours employed in painting on the leather to portray animals, human beings, numbers and letters of the alphabet. It was also evident, however that whenever the colour of the picture of some objects like banana did not contrast well with the background colour of the leather, the children less appreciation such objects during the teaching and learning activities. As a result, the children could not identify the banana as readily as expected. The banana shape was re-painted with yellow and green colours and mounted on new background leather with black inscription for the children to see it more clearly. From the cooperation the teachers experienced, they commented that the images on the leather seemed to be more realistic, and they could easily register in the minds of the children during teaching.

### Attractiveness

Since the level of attractiveness of the leather teaching and learning materials were tested based on their ability to be manipulated to aid the teaching and learning of different subjects such as Mathematics, English Grammar and Environmental Science, suitable

and friendly themes related to the daily activities and interests of children were chosen. These themes surrounded on addition and subtraction (Mathematics); identification of letters of the alphabet, formation and pronunciation of words and filling in of missing letters in words (English Language); identification of objects, fruits, vegetables, animals and human body parts (Environmental Science). Having observed the proceedings of the teaching and learning activities as conducted by the teachers, it was noticed that the children could assimilate and appreciate the aiding competence of the instructional media as well as the contents of the lessons and themes taught. Plate 2 portrays one of the joyful moments of the kinds ability and the ease with which they identified, picked and showed the letters of the alphabet to the class during the teaching and learning sessions at the KNUST Nursery School.



*Plate 2: A happy pupil showing a letter of the alphabet to the class*

Also, the pictures depicting rhymes written on leather (as found in Plate 1(a)) attracted the attention and concentration of the children during the lessons. They could easily identify the pictures of the animals in the rhymes and grasped the concepts with ease. It came to light that the attraction of the pictures always prompted children to recite the rhymes with or without the teachers' help.

Generally, it was observed that every child wanted to get hold of the pictures that depicted a boy and a girl and claimed to be his or her photograph. During the Environmental Science lessons on "Parts of the Human Body", the teachers skillfully used the materials to communicate effectively to the children. This was possible since the teaching and learning materials made looked realistic. In addition, it was glaring that the bright and childlike colours used fascinated and facilitated the pupil's ability to identify the letters, shapes, objects, words, symbols and numbers easily. The dominant colours were red, yellow, blue, orange and green. The usage of cool and warm colours

was noticed to have had control on the temperament of the children. The warm colours also happened to stimulate those who were dull in the class to participate actively. In terms of the attraction possessed by the instructional materials produced, it can be concluded that the pictures, symbols, colours and the shapes of the instructional materials were vivid enough to attract attention, gain their concentration, create retention of ideas and also arouse the children's interest.

### **Manipulability**

Using manipulation as a measure to determine the effectiveness of the instructional materials required handling and using the instructional aids to teach various topics. The numbers and basic mathematical signs could be arranged and rearranged to teach diverse topics in Mathematics (number identification, addition, subtraction and finding missing numbers). The letters of the alphabet could be organized in various ways and at different positions and be lifted, hanged, placed on a table or picked and displaying on walls to support the teaching and learning of different English Language topics such as nouns, spellings, pick-and-say and word formation. The objects, fruits, vegetables, human figures and basic geometrical shapes could be lifted with ease since the sizes and shapes were appropriate (Plates 3(a) and 3(b)).



*Plates 3(a) and 3(b): Depict the manipulative abilities of the leather teaching and learning aids*

During the test process, it was noticed by both the teachers and the researchers that the leather instructional materials were handy and could be handled by all the children, no matter their age differences. This was due to the light-weight nature of leather as compared to wood, metal, plastics and some papers. Another advantage identified was that the materials did not occupy too much space in the classroom.



**Durability**

The durability of leather instructional materials was tested in the course of the research to find out their resistance to destruction from pressures and manipulations from teachers and children, as well as the extent of survival when using them in class. During the test, critical attention was paid to observing the survival of the materials against wear and tear, scratch, discolouration and dirt. The children had the opportunity to play with the instructional materials throughout the period of the study. It came to light that the instructional materials could withstand rough handling by the children to prove the durability of the leather. This proved that the used leather is reasonably resistant to wear and tear as confirmed by Asubonteng (2010). The acrylic paint protected the surface of the leather teaching aids from water marks and perforations. The teachers commented that due to the durable nature of the instructional materials, they could last for a long time.

**Safety In Use**

With the common knowledge of preschool children being curious, playful, explorative and manipulative, to mention a few, safety measures could not be taken for granted. Testing the safety of the leather teaching and learning materials was regarded paramount to determining their efficacy in avoiding injuries when being used in classroom sessions. The aim was to assess and ensure that the materials used such as leather, strawboards, colours, and shapes of the instructional media posed less or no harm to children of such age.

More importantly, it was noted that throughout the study period, there were no reports of any damages caused to any of the children by the leather instructional materials. The teachers confirmed the child-friendly nature of the materials. Also, due to the conscious efforts exerted to curve the edges of the teaching aids, they were devoid of sharp edges to avoid causing injuries. It is worth mentioning that since children like putting things into their mouths easily, it was ensured that the vegetable tannins used in preparing the leather could cause no threat to human health. The use of tannins, dyes, glue and polish were health-friendly and avoided from direct human contacts.

**Fitness For Purpose**

The features of the designs were created to fit the interest of the children – this ensured ergonomics in the purposes for which the instructional materials were made. The

selection of the items was carefully done, and was limited to concepts, thinking and reasoning within the confines of the preschool curriculum in Ghana. This made the instructional media very cordial, prerequisite and vital to the children's educational process.

Significantly, it was noted that the colours employed in the painting, dyeing and marbling of the leathers to portray the images were in conformity with the atmosphere of the classrooms as created by the colours which had been used in painting the rooms. When the items were hanged on the walls of the classroom, the pupils could easily learn on their own, or with the assistance and direction of the teachers. *Plates 4 (a) and (b)* depict the level of participation of the pupils as a result of the arousal caused by the use of the leather instructional materials during the exercise.



*Plates 4 (a) and (b): Pupils responding to questions from their teachers during the exercise*

The preschool children were able to recognize, identify, form, spell and pronounce any word, number, objects, within their domain that was presented with the leather instructional materials. The instructional materials could serve many purposes; hence, they were fit for purpose in preschool educational environment.

### **Conclusions**

The study found out that the Ghanaian vegetable tanned leather is mostly available in the northern than the southern parts, but it is easily accessible. The quality declines from the north towards the southern indigenous tanneries. Most of the leathers used were fairly soft and easy to manipulate to achieve the desired shapes, forms and sizes to suit the intended purpose (preschool children's educational aids)

The instructional materials produced with leather were child-friendly. The researchers employed the use of various techniques such as painting, marbling and scorching to produce the instructional materials with leather to aid teaching and learning at preschool level of education. The study successfully produced the instructional materials with leather for preschool children.

Based on the findings of the study, it can be concluded that leather, due to its diverse properties, permits itself to be used as a suitable alternative material for the production of legible, attractive, durable, manipulative and safety and fit-for-purpose instructional media to aid teaching and learning at the preschool level of education.

#### **Acknowledgments**

There are a number of people who have contributed in various ways to the success of this research and must be recognized. Mr K.A. Baah, for the time he put into this study. Dr Mariama Ross is acknowledged for her suggestions and for providing helpful insights. Much of the success of the project is due to the Head teacher, teachers and pupils of KNUST Nursery School, who agreed to provide a site for the study. Without their willing co-operation, nothing could have been done.

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