



Why Weaving? Teaching Heritage, Mathematics, Science and the Self

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Abstract Weaving provides an access point to teach students about the heritage and the dynamic cultural importance of weaving practices in Africa. Weaving education teaches patience and perseverance. It also teaches math from a practical and problem-solving stance, which values ethnomathematical knowledge and skills. Weaving teaches science through the understanding and environmental sustainability of local plants and their practical uses. Throughout this article, we have interwoven our own teaching stories from Canada and Ghana (Allison Balabuch) and Madagascar (Bako Rasoarifetra) through the themes of heritage, mathematics, science, and the development of the self. This article discusses the importance and value of including weaving education into the classroom.

Résumé Le tissage offre un point d'accès pour enseigner aux élèves le patrimoine et l'importance culturelle dynamique des pratiques de tissage en Afrique. L'enseignement du tissage enseigne la patience et la

persévérance. Il permet également d'enseigner les mathématiques dans une optique pratique et de résolution de problèmes qui valorise les connaissances et les compétences ethnomathématiques. Le tissage enseigne la science par la compréhension et la durabilité environnementale des plantes locales et de leurs utilisations pratiques. Tout au long de cet article, nous avons entremêlé nos propres histoires d'enseignement au Canada, au Ghana (Allison Balabuch) et à Madagascar (Bako Rasoarifetra) à travers les thèmes de l'héritage, des mathématiques, de la science et du développement du soi. Cet article démontre l'importance et la valeur de l'intégration de l'enseignement du tissage dans les classes d'école.

Keywords Weaving · Ethnomathematics · Heritage education · Place-based learning · Pedagogy · Archaeology · Africa

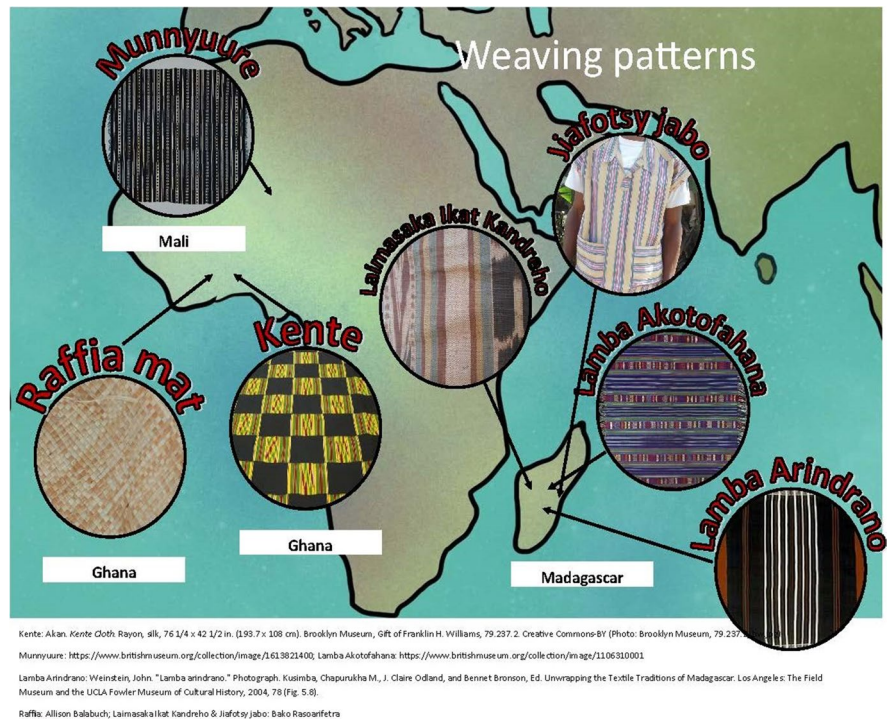
Introduction

Weaving has been a rich part of African history for centuries. Many African communities believe that weaving and the action of wearing cloth all come together to communicate the ongoing, dynamic, and social practice of culture (Fig. 1). From the celebrated Malagasy *lamba* cloth woven in Madagascar to the recognizable *kente* cloth from West Africa, woven African textiles continue to be an important source of income and learning. Through Arabic

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Fig. 1 Map of Africa featuring weaving patterns discussed in the text. Artist: Allison Balabuch



texts, we know that cloth and textiles have been traded widely across Africa since at least the eighth century CE (Picton, 1995). The oldest evidence of woven fibers found by archaeologists in West Africa comes from a burial site in Kissi, Burkina Faso (see Fig. 2 in the “Introduction”), and dates to as early as the first to fourth century CE. Textiles found in caves in the Bandiagara escarpment in the Dogon area of Mali show a rich variety of clothing and accessories woven from cotton and wool. Dogon oral history tells us that the Dogon met the Tellem people in this area when they first arrived sometime in the fourteenth or fifteenth century CE (Bedaux, 1988). Like Kissi, these caves were used for funerary purposes between the eleventh and eighteenth centuries CE (Magnavita, 2020). Dogon funeral poetry uses metaphors of spinning and weaving to celebrate the knowledge and skill of the deceased, as illustrated by this excerpt of a burial poem for a Dogon woman:

Bai turupana,

Bai turugeda,

Gene gala ejugereleru.

One day she spun thick thread,

One day she spun thin thread,

The spindle danced in her hand (Lane, 2008, p. 91).

The reference to both thick and thin threads shows the woman’s versatility, and the dancing spindle speaks to her dexterity and skill.

In Africa, weavers use a wide variety of fibers—wool, raffia, silk, and cotton—to make cloth. Weavers also use bast fibers, the inner bark from various trees and plants, to make the clothing and accessories needed for everyday life (Idiens, 1980). Evidence of textiles made of woven bast materials is relatively rare in Africa. However, recent studies of textile fragments from Igbo-Ukwu, Nigeria, show well-developed weaving traditions of bast fibers from fig trees (*Ficus*) dating to the eleventh century CE. The narrow diameter of the *Ficus* bast yarn and the density of the weave were probably achieved on a vertical single-heddle loom and are evidence of highly skilled weavers (McIntosh & Cartwright, 2022). Such material traditions have been threatened by industrial cloth production and plastic or metal replacements for baskets. However, the traditions and teachings persist and are reemerging in many parts of Africa.

Fascinating information, isn’t it? Well, it is if you are an archaeologist or a passionate enthusiast of plant knowledge, animal husbandry or art. But why would educators in Africa and beyond want to teach students about weaving? As Robertson (2014, p. 5) asks: “Can a certain textile, or specific material

culture, focus on solving current issues surrounding the environment, sustainability, social welfare, and more?” We—Allison Balabuch, a teacher from Victoria, BC, Canada, and Rasoarifetra Bako, an archaeologist from Madagascar—believe that it can and does. Besides the cultural importance of hand-woven cloth, mats, and baskets, weaving helps teach young people perseverance and patience alongside the mathematics and science skills that promote land stewardship (Johnson et al., 2021). It also fosters their creative and critical thinking. By including weaving education into school classrooms, we value practices and skills that are deeply rooted in regional histories. It can also help students build skills that can support them as adults. Throughout this article, we have interwoven our teaching stories centered on weaving through the themes of heritage, mathematics, science, and the self.

Teaching Cultural Heritage

Bako, Madagascar

In 1995, Madagascar, a large island in the Indian Ocean, experienced a great tragedy. Due to a devastating fire, the *rova of Antananarivo*, known as the Queen’s Palace, lost a large part of its material cultural heritage. Among the objects that perished in the fire were more than 200 precious hand-woven textiles and the clothing effects of sovereigns who reigned in Madagascar from the eighteenth to the nineteenth century. In 2004, a grant from the Ambassadors Fund for Cultural Preservation (American Embassy) to the Ministry of Culture of Madagascar allowed a joint American-Malagasy team to proceed with the conservation and restoration of about 50 remaining royal textiles, organize a temporary exhibition at the Palace of Andafiavatra in the capital, and prepare an educational kit for a traveling exhibition to schools. *La Valise* (The Suitcase) was born.

The main objective of *La Valise* is to raise awareness of the importance of preserving Madagascar’s heritage. Its pedagogical approach includes several domains: environment, science, and art, as well as educational qualities such as know-how and resilience. The suitcase contains four small image exhibition panels, a miniature loom, eight specimens of *lamba* made of silk, cotton, and synthetic materials,

and a box of raw materials. All of this is accompanied by a pedagogical booklet for the teacher and a practical guide for the use of *La Valise*. It offers students the opportunity to discover and immerse themselves in the world of Madagascar textiles and reflect on the knowledge inherited from their ancestors. *La Valise* also gives them the opportunity to wear the *lamba* with all its cultural meanings and values.

Lamba was widely sought out by traders on the Indian Ocean and the African continent throughout history. This silk often has intricate patterns of flowers and trees. Some interpret these patterns as connected to the Malagasy word for honor, which literally means “those who are the flower of the grass” (Peers, 1995, p. 46). *Lamba* has always held significance in relation to rank and power: the more elaborate the pattern, the larger the piece, and the better quality of workmanship or materials went hand-in-hand with a higher rank in society.

The project is motivated by the fact that the techniques and knowledge of silk *lamba* are threatened by the growing use of industrial textiles. Museums hold a responsibility to keep them alive as a living heritage by transmitting knowledge about the methods of their production and exhibiting them. Because museums are concentrated in urban areas, *La Valise*, a small mobile museum with its collections, becomes an educational tool for schools whose access to museums is restricted.

The educational material in *La Valise* provides learners with important information on the history of textiles and weaving in Madagascar. Knowing something of textile history allows students to understand the importance of heritage for, as Plato, the ancient philosopher observed, “Inheritance is transmitted, heritage is acquired.” Ancient texts such as those of François Cauche (1910) and Etienne de Flacourt (1913) give testimonies of their time relevant to the traditional textile industry and the wearing of clothes by the population. Archaeological excavations at sites such as Mahilaka (ninth through twelfth century CE), the first Swahili city on the northwest coast of Madagascar (see Fig. 4 in the “Introduction”), have uncovered soapstone discs used as spindles for spinning and weaving (Radimilahy, 1998). This hypothesis is further reinforced by discoveries of similar tools made of bone or wood on the East African coast around the twelfth century CE in an area that saw commercial exchange across the Mozambique Channel (Chittick,

1974). Madagascar is said to have exported raffia yarn and weaving products as early as the thirteenth century (Allibert, 2007), and raffia fabrics, known as *rabane*, were highly sought after by Yemeni merchants for export to Iraq and Yemen. This raw material is also used for the production of *lambalahimasaka*, a textile woven with a mix of raffia and cotton. The name *lambalahimasaka* means cooked dyeing, a technique inherited from Indonesia Ikat based on patterns formed by the use of several colors.

Learning the history of weaving and textiles in Madagascar helps students appreciate and understand different aspects of their heritage and to become aware of the importance of this knowledge. According to traditions, each family had a loom, and women were in charge of weaving the fabric needed to clothe the family. From a young age, girls learned how to prepare thread. From adolescence, each girl was expected to put herself on the loom to keep the tradition alive. Mastery of weaving and braiding was one of the conditions required to find a spouse in the future. Proverbial wisdom denigrates the woman who does not know how to weave or who is simply lazy: *Ikalaadalaambodytenona, sadytsyhitohynymaito no tsyhanalanykambana* (The fool in front of the loom; she does not reattach the broken threads nor does she separate those that are joined).

Teaching Heritage and Mathematics

Allison, Canada

Across the world from Madagascar, on Vancouver Island, Canada, I was trying to find better ways of connecting students to their learning by bringing mathematics to life through cross-curricular, themed projects. Textiles have been a medium through which I have successfully bridged mathematics, science, history, and language by engaging students in the hands-on practice of weaving.

Like *lamba* in Madagascar, bold, geometric *kente* cloth from western Africa, notably Ghana, also communicates importance, story, and power. Threads of cotton, silk, or today's rayon are woven into strips sewn together to make a larger cloth. *Kente* was originally reserved for high chiefs or the Asante head of state (Asantehene). Over time, restrictions were loosened to include sub-chiefs, royalty, and the rich before

kente became more widely available to common people. The patterns and colors of *kente* are chosen for their significance. Each pattern has a name and associated spiritual meaning for the wearer (Kwami, 1995). Some names of *kente* cloths are proverbs in Twi, such as *Awerekyekyere, yefa no nipa ho*, which means *you can only get consolation from another human being*. Other *kente* names and patterns mark important events, discoveries, or personalities, such as *Oyokommaantoma*, which commemorates the first Oyoko (an Asante clan) women who brought European textiles to Bonwireand and unravelled them in order to reuse the colorful threads (Asamoah, 2021).

Also important to reading a *kente* is its color. Certain colors are worn in specific circumstances, with serious consequences if you wear the wrong one. A white *kente* can be worn to communicate grief over the loss of a loved one who lived to old age, whereas a yellow *kente* worn by a chief embodies the state's wealth in gold. All of these colors and patterns are passed on from master weavers, with new ones developed through the mathematics and design skills of the weaver, as well as through spiritual dream connections (Dilley, 1999).

My Canadian students engaged deeply in conversations about color and pattern, especially when these have significance that can be understood when you know its "language." A Know-Do-Understand model of learning (Balabuch & Stahl, this volume) deepens engagement and comprehension of knowledge and skills through embodied forms of knowing gained through "learning by the body" (Singleton, 1998, p.16). We can learn content knowledge, such as the significance of *kente* cloth patterns and colors. However, it is through the active, hands-on activity of graphing and recreating patterns that a deeper understanding of mathematics and design skills is achieved. A potentially disengaging text about silk production and the history of weaving became a puzzle to decode and recreate on graph paper. It presented students with a problem to solve and sparked the creativity to develop new patterns and shapes. All these helped build their confidence, as apprentice weavers have experienced throughout history.

Allison, Ghana

Like my students in Canada, the students I worked with in Banda-Ahenkro, Ghana, in July 2022 also

developed their skills and knowledge through the hands-on practice of weaving. Not only did they play with patterns, but also they developed a deeper confidence in what they could do. Sitting in the window of a schoolroom in rural Ghana, a boy worked on his weaving project (Fig. 2). The classroom was alive with conversation and bubbling with laughter and struggle as a class of junior high students tried weaving for the first time. The boy sat apart. I approached to see how his weaving was coming along.

"How is it going?" I asked.

"Ok."

He shrugged shyly and held up his forked branch loom, strung with the only yarn we could find in the small, rural community: a nondescript brown.

It is perfect. He had managed to balance the tension of the weft and the weave despite the uneven branches that formed his makeshift loom. When praised, he shyly smiled and went back to his work.

Through weaving, students can deepen their connections to the mathematics skills that have been passed down through generations. This requires developing a deeper understanding of what mathematics is and expanding that definition to include symbolic computation and spatial and numerical abilities interconnected with culture and craft production

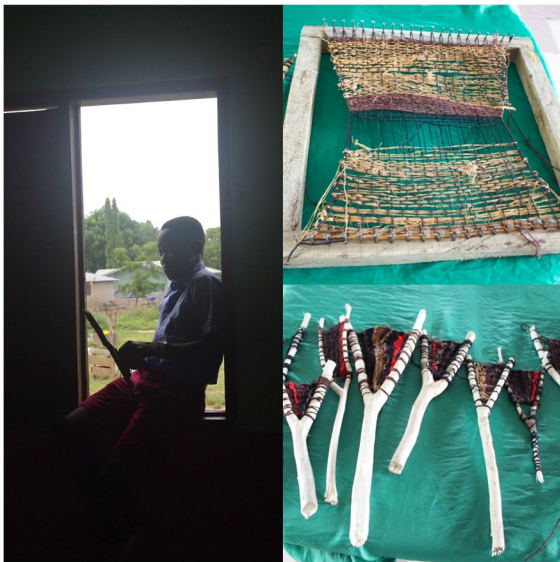


Fig. 2 A Ghanaian student sitting in a window working on a weaving project with final projects featured on the right side of the image, Banda-Ahenkro, Ghana, July 2022. Photo by Allison Balabuch

(Thompson, 2022). The boy, who not only completed a perfect first piece of weaving but then played with different materials to create patterns and texture, was unsuccessful on traditional mathematics exams. So do we say that he is poor at mathematics? Or is he simply poor at school mathematics? Mathematics education in schools has long been seen as a scholarly pursuit that is a gatekeeper for higher education, such as universities or trade schools (Thompson, 2022). Ethnomathematics, which explores the links between cultural and artistic practices and spatial or numerical thinking, is often seen as a lesser skill (Laurens et al., 2021), especially in cases where weavers are women (Harris, 1987).

Bako, Madagascar

Like the mathematical skills required in pattern creation, weaving teaches computation and the geometric skills needed to make cloths of precise dimensions and estimation skills for predicting materials needed for a specific project. I was visiting a college classroom and asked whether we can teach and evoke mathematics in textile weaving. The students smiled and shrugged. Oui! But how? The *La Valise* collection comprises eight different *lamba*, and we will understand the necessity of the knowledge of numbers and shapes.

We recognize the use of the *lamba* thanks to their dimensions, so here we are talking about numbers (Fig. 3). *Lamba*, always rectangular, have standard dimensions: those worn by women on the shoulders vary in length, 200–210 cm, and 46–75 cm in width. A scarf is narrower and shorter, measuring 30 × 140 cm. For men, the draperies covering the body at mid-leg are made of two panels, each measuring 210 × 75 cm. It is usual to use 5–9 panels gathered on the length of a shroud.

Knowing the kind of cloth she intends to weave, it is necessary to calculate the number of threads for the warp and the weft before the weaving begins. In traditional practice, women had to make a mental calculation to evaluate how many threads were needed. When questioned, a weaver answered: "I have acquired it by experience. I do not know the yardage, but I count the skeins. The textile in cultured silk requires more threads than the one in cotton or wild silk, whose threads are bigger... The price of the textile is evaluated according to the cost of the raw

Fig. 3 Educator holding out a *lamba* for examination by students learning to recognize the use of *lamba* by its dimensions. Photo by Bako Rasoarifetra



material and the working time it took to make it.” Weavers must use computational skills to determine material needs, threads, yarns, or plants and to predict an object’s shape and size upon completion (Dilley, 1999).

Allison, Canada

“How many threads do I need?” a student asked, examining her loom with a quizzical expression.

“What are you hoping to do?” I asked.

“Weave,” she answered.

“But, weave what?”

“Well, I’d like to make a scarf.”

She held her hands apart, eye-balling the distance between them until she found an ideal in her imagination. “This big! And about... [readjusts her hands to a wingspan] about this long.”

Like the *lamba* cloth dimensions, “this big and this thick and this long” become mathematical problems. The number of threads per inch in a piece of fine silk vastly differs from a coarsely spun wool shawl.

I told the student: “Wrap the warp and weft threads neatly side by side, and you will see how many warp threads you need per cm, or inch, on your loom. Multiply that by how wide you would like your scarf, and you’ll know how many warp threads to start with.”

The student cocked her head to the right and looked contemplatively between the ruler and her loom. Then she said: “I was just going to guess...but measuring seems easier. What if I want to make a circle? Can you do that in a weaving pattern? The graph paper is only ever squares....”

When a student learns to weave, they also learn how to duplicate and create complex geometric patterns (Harris, 1987; Thompson, 2022). Creating weaving designs requires complex geometry and the ability to tessellate (create complex patterns from repeated shapes) and interlock shapes, which include design elements created with different colors and patterns of warp and weft threads (Gerdes, 2017) (Fig. 4). Apprentice weavers begin with simple designs and move to more complex ones as their weaving and mathematical skills develop.

Bako, Madagascar

The process of weaving motifs on the *lambaakotofahana* aroused the curiosity of the learners. This way of weaving is a technique of embroidering a silk motif on a cloth also made of silk. In 1981, the ethnologist Domenichini (1978) made a collection of traditional patterns based on geometric shapes but inspired by plants. These drew from the work of two weavers, aged 81 years and 85 years, in the region surrounding



Fig. 4 Student-made looms, student pattern graphing, and final weaving project. Photo by Allison Balabuch

Antananarivo, the capital. They taught him the knowledge (technical and esthetic) transmitted from generation to generation, which they were very proud to steward and share with the ethnologist. In fact, the weavers worked on a model codified by a system of numerical notation corresponding to the selection of the smoothness of the decoration. For example, the codification for a small brocade has 32 lines of numbers, read from right to left: 21141114112 (1st line), 311414113 (2nd line), 411313114 (3rd line), and so on. To execute the masterpiece, it is necessary to master the calculation and coding as well. The numbers transcribed from left to right correspond to the selection of the decorative heddles; for the same line, they indicate alternately the number of heddles taken and the number of heddles left. The first line constitutes the base of the pattern (Domenichini, 1978, 1988, p. 34).

Teaching Environmental Stewardship

Weaving is often categorized as arts and crafts but can also be integral to place-based education and biocultural knowledge transmission (Johnson et al., 2021). Place-based education creates connections for students to their own communities and with

communities worldwide (Nicol et al., 2013). Helping students develop a deeper and more meaningful knowledge base about their environment fosters a sense of responsibility to protect the natural resources surrounding them. It also helps to redefine what we see as science in a similar way weaving helps us to redefine math (see also Balabuch & Stahl, this volume). Identifying useful plants leads to deepening the youth's understanding of sustainability and responsible harvest.

Allison, Ghana

Back in Banda-Ahenkro, the local teacher and I had brought only one square peg loom for the class to try after they worked on their branch looms. Seeing the shy boy's progress, the teacher invited him to the larger project. As we strung the loom together, we talked about how the same techniques can be used with plant materials as with the store-bought string. His teacher headed out of the class to the playground and returned with a stick. He showed the boy and me how its inner bark is pliable when peeled away from the core, and that when it is dry, it will keep its shape and will not rot. We experimented with the yarn purchased from the store and the bark fiber from the teacher.

"I know a plant that will also work." The boy said and immediately rushed out of the room in search of his quarry.

Later in the week, the boy brought his completed weaving to show me. It was a beautiful woven collage of store-bought brown string and local plants. His smile, still shy, glowed with pride. His teacher told me later that the boy is not a "successful" student:

"He just sits at the back. He rarely passes exams, finishes tasks, or even looks up in class. This is the first time he has 'come alive' at school."

Learning how to weave also deepens the connections to cultural heritage while providing the skills to make a living as artisans and entrepreneurs. In many communities around the world, weaving is passed from parent to child or master to apprentice. Along with the practical skills, knowledge of the meaning and mathematics of patterns, material preparation and protection, and entrepreneurial skills are also taught, just as Lave and Wenger (1991) show in relation to other textile arts, such as tailoring in Liberia. Colonialism and modernity have interrupted these economic

Fig. 5 The presentation of the raw materials box included in *La Valise*. Photo by Bako Rasoarifetra



systems in many ways. Teaching the value of the mathematics used in everyday tasks strengthens the relationships between youth and elders in their communities by changing the narrative that only school math has value (Amit & Qouder, 2017).

Bako, Madagascar

Madagascar is known for its exceptional biodiversity with a high degree of endemism of 80%, so the appreciation of the richness of nature and the environment is made from the box of raw materials for textiles (Fig. 5). The kit presents the cocoons, in their raw form, of wild silk gathered in the forest of Tapia (*Uapacabojer*), together with domestic silk moths (*Bombyxmori*), a species introduced at the beginning of the 19th century and fed by the mulberry tree. Students see cotton growing in dry regions, raffia, and hemp. The cocoons and plant fibers transformed into yarn reflect the precise spinning technique.

The big surprise for the young students was the discovery of raw materials for dyeing. What knowledge of chemistry did the traditional weavers use for color composition? Again, nature's resources are used to obtain the basic colors and the means to fix them; the acquisition of know-how results from plant observation and experimentation. The box contains ambora wood (*Tambourissa* sp.), the source of orange color in dyed cloth; indigo (roots, branches) for black and blue; saffron powder for yellow; *nato* wood (*Faucherea*), whose bark gives a red color; dried lichen

for green or red. Sarah Fee (2009) notes in the pedagogical file accompanying the case that Madagascar exported more than 1000 tons of lichen from the southern region of the island to Europe between 1860 and 1900. Research on natural dyes has led to the identification of more than 200 dye plants in Madagascar.

Allison, Ghana

Owusu Alexander, a Nafana mat weaver from Sabiye, Banda District, Ghana, learned to weave traditional mats in school when he was a child. I met him while in Ghana in July 2022. We were documenting traditional knowledge through a project funded by the British Museum's Endangered Material Knowledge Programme. He told us that he learned to weave from a community member who was brought in to teach the students when he was in grade school. This practice of community craftspeople coming into school classrooms is not common today in Ghana, but local school teachers in Banda District are trying to bring it back.

I use gbandεε or raffia plants to weave mats. The best time to harvest raffia is from March until the rainy season. When the rains start, the plants start to develop, but when all the fronds or pinde, are open, they are too mature for weaving. I harvest only the good leaves. What I leave on the stick are the ones I don't want. At

home, I will dry the ones I want before using them for the work. After drying them, I remove the sticks from the fronds, either for me to sell or for women to use in the house.

When you harvest, you cannot take too much from one area. If you do, you will need to find a new place to harvest as they don't come back very fast. The next time you harvest, you go to another place to allow this place to develop. While I harvest the fronds, I bundle the ones from the same plant because they are the same length. If I dry them together like this, it will be easier to keep them sorted for weaving. I lay out the fronds to dry in the sun. If they are not dry when you weave with them, they will make holes in your mat when they do finally dry.

I lay them on the roof to dry in the sun...but don't dry them on the ground! The goats will eat them all for their dinner.

Owusu Alexander, Nafana mat weaver, July 2022

Owusu Alexander shows us the importance of respectful harvesting and the importance of protecting the land and the resources. He also teaches us how each part of the plant can be used to reduce waste. The parts of the raffia plant that are not good enough for use in weaving a mat are repurposed for fire starter, brooms, and animal food.

Teaching the Person

Bako, Madagascar

In traditional education, there is no better school for the construction of the individual than the family and society. From a young age, a girl is integrated into the main activities such as weaving and braiding, which gradually imbue the child with various knowledge and skills required to carry out the task that will be assigned later. To illustrate this aspect of socialization, a tradition from southern communities, the weaving of the traditional *lamba* called *arindrano*, is shared with the learners so that they can understand the physical conditions and state of mind of the weaver and the work environment.

The *arindrano*, made with three colors (black, red, and white), is woven in wild silk or cotton. It is recognizable by the alternating vertical stripes of different widths. High dignitaries typically wear it, but it can

be worn during major ceremonies or by newlyweds at the time of marriage. It can also be worn by the mother, draped over her child, to mark the first public outing of a newborn baby. In addition, this *lamba* can be used as a shroud or offered during a second funeral. In short, this fabric has great symbolic value in the Malagasy culture. Making this kind of textile takes a long time and requires calmness, self-confidence, strength, patience, and resilience.

Calmness and self-confidence: It is forbidden to quarrel in the family or the group and to have the mind preoccupied by other things while making this textile.

Strength: The family organizes a big meal called *hanematanjaka*: dry rice with a poultry stew (chicken, goose or duck). The whole community participates in the meal and blesses the weavers. The weavers may have five meals a day to build up their strength.

Patience and resilience: Weaving can last for days. The weavers are not allowed to leave the loom except to sleep, eat, and care for their personal needs. In case of technical difficulties, they must deal with the damage (without stress) and solve the problems. Two weavers may take turns on the same textile, and when the *lamba* is finished, the owner offers a standing zebu cattle as a reward. The zebu can then be kept or slaughtered for a communal meal or distributed to the community as a celebration. This reminds us of what the archaeologist Leroi-Gourhan (1971, p. 280) said about weavers and their work: "Weavers, at least those who have worked everywhere and at all times for the social elite, are wonderfully patient and skillful, and their work often has nothing to do with their products."

Allison, Ghana

Fulani people from West Africa claim to be the originators of a white and dark blue cotton blanket called *munnyuure*. This blanket continues to be produced by the Dogon of Mali and the Yarsé weavers in Burkina Faso, even though it is not often made by Fulani weavers today. The root word of this name comes from the Fulani word *munnyuude* which means to endure or to be patient. It can also be understood as "Only a patient weaver is capable of finishing it without mistakes" (Boser-Sarivaxévanis, 1991, p. 41). When working with students on weaving projects in Canada and Ghana, I noticed that patience and perseverance were key

understandings. Many students in my Canadian classrooms have little experience working in a sustained manner on a project that takes as much patience as weaving. “What do I do? I made a mistake a few rows back?” is a common interjection. The only answer is to rip the work back and correct the mistake. The process of weaving and unweaving shifts the understanding of what is learning and what is accomplishment. Students began to see that even when they were undoing their work, they were not “going backwards”; they were progressing in their skill even when their project was not growing in length or size. This patience and perseverance is felt in the calmness of the room when students are weaving. It is not a quietness that feels empty but a quiet stillness of mind as hands work to add threads to their pieces. The theory and history of weaving piqued students’ interest more when they were also engaged in the hands-on aspect of learning. We watched video clips of weavers in West Africa using wooden looms with foot-controlled heddles. The speed and dexterity in the videos left students in awe as they compared it to their slow progress without the technology of the sheds and heddles.

Conclusion

Why weaving? Learning about the history and heritage of weaving develops deeper connections to local practices across Africa and the world. This approach favors a competency-based approach aimed at helping learners develop the skills they need to succeed. It teaches the rich material and technological innovations that have been developed to produce sacred and daily cloths, mats, and baskets. These objects are not fixed but continue to grow and change as weavers interact globally through trade, as they have done for millennia across Africa. The interdisciplinary reality of weaving also teaches the value of mathematics and science needed to process materials, create dyes, and realize complex patterns. Connecting with local plants and resources provides a context for students to engage in respectful harvesting and sustainability. Weaving connects to the education of the “person” as it teaches patience, strength, perseverance, and calmness. Through *knowing* the weaving theory and history and actively engaging in *doing* a piece of weaving, students can develop a deep *understanding* of their past and present, and this can give them skills and inspiration for the future.

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