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The "Ticas" of "Matema"[1] of an African People: An exercise for the Brazilian Classroom.

As "Ticas" de "Matema" de Um Povo Africano: Um exercício para sala de aula Brasileira.

Eliane Costa Santos[2]

(English translation by Anne Stafford)

Abstract

This article has as its central focus the examination of one of the ways that African culture can be introduced into the mathematics classroom, contributing to the transformation of this formal space of the classroom into an area in which culture is intertwined with scholarly knowledge through the transdisciplinarity of ethnomathematics. The thesis that permeates [this work] can be delineated as how African culture, through the representation of African Kente cloth looms, can contribute to the processes of teaching and learning in a mathematics classroom. The wefts are the theoretical references of Stuart Hall on culture and multiculturalism; D'Ambrosio on transdisciplinarity and ethnomathematics; Dennis on Kente cloth; and the weavers of Ghana on the technologies of Kente cloth. To find a general understanding, we locate Ghana on the African Continent, we quote the myths of the Kente looms, and finally, we present a proposal on how to create a transcultural connection between the knowledge of African culture and a mathematics classroom in Brazil.

Keywords: African Culture; Ethnomathematics; Transdisciplinarity, classroom

Resumo

Este artigo tem como foco central apontar uma das alternativas para a introdução da cultura africana numa sala de aula de matemática – concorrendo para a transformação deste espaço formal de uma sala de aula, um espaço no qual a cultura está entrelaçada aos saberes escolares por meio da transdisciplinaridade da etnomatemática. A relação que permeia pode ser delineada de como a cultura africana, por meio da representatividade dos fazeres dos teares africanos Kente pode contribuir com os processos de ensino e

[1] The meaning of "Ticas"' and "Matema" in this title is a wordplay based on the roots of the word Mathematics in Portuguese.

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aprendizagem em uma sala de aula de matemática. As tramas estão por meio do referencial teórico de Stuart Hall sobre cultura e multiculturalismo; D'Ambrósio sobre transdisciplinaridade e etnomatemática; Dennis sobre tecido Kente e os tecelões de Gana com as tecnologias do tear Kente. Para uma compreensão geral localizamos Gana no Continente Africano, citamos o mitos do tear e por fim apresentamos uma proposta de como exercitar uma relação transcultural a partir do saber fazer da cultura Africana em uma sala de aula de matemática no Brasil.

Palavras-chave: Cultura Africana; Etnomatemática; Transdisciplinaridade, sala de aula

INTRODUCTION

"Learn from the past, build on the foundations of the past. In other words, return to your roots and build on them for the development, the progress and the prosperity of your community in all aspects of human realization".[3]

This Adinkra ideogram [Sankofa] from Ghanian culture conveys the idea that "It is never too late to return and reclaim that which was left behind", as a symbol of reconciliation and consciousness of the need for revisited perspectives.

In 2008, Brazil reached 120 years of the Abolition of Slavery which pronounced our freedom; 60 years of the Universal Declaration of Human Rights which states, among other terms, the right to a decent education; 20 years of the Federal Constitution of Brazil which provides an education for all; 5 years since the adoption of Law No. 10639/03 requiring the inclusion of Afro-Brazilian and African history and culture in education; and 1 year of the Development Plan for Education that links the right to formal education to the full exercise of an active citizenship.

Given the complexity and conflict in the challenge of promoting racial equality in Brazil through education, and the psychological effects of inequality and the lack of discussion on cultural diversity in the classroom, there is a growing group of researchers who have emerged from the phase of denouncing these problems to suggest alternatives for how to help close this gap and make connections between Black culture and the classroom. For example, Ana Célia da Silva, Antonio Cosme Lima, Eduardo David Oliveira, Henrique Cunha Jr., Lindinalva Barbosa, Maria Nazaré Mota, Silvandira Arcanja, and Vanisio Silva

[3] Nascimento, Elisa Larkin (org.). Matrizes Africanas da Cultura Brasileira- RJ.; Eduerj 1996 p. 19

are among those that have presented proposals in different areas relating to Brazilian culture, African culture and the classroom.

However, it is noted that there is a gap in the interface between technical or artistic modes (TICA), and the modes of explaining, knowing, and understanding (MATEMA) of an African people in the math classroom of Brazil, thus an exercise in the transcendence of disciplines. It is precisely this point that guides this article.

Having experienced with [Ghanian] weavers the wisdom generated by mutual interaction resulting in the African cultural knowledge of Kente, I had the intention to contribute to the discussion of ETHNOMATHEMATICS using D'Ambrosio's theory as my reference.

The ethnographic [ETNO] basis is the African culture of the people of Ghana; the transpositions were inspired by Paulus Gerdes through the "re-appropriation of traditions" of the African people. The exercising of the transdisciplinary approach in the use of fabrics in the classroom again invokes as a reference the theory of D'Abrosio.

According to D'Ambrosio (1997), the transdisciplinary reflections are inspired by ideas coming from all regions, from different cultures and traditions, resulting in a posture of recognition that there are not places and times that are privileged. However, I seek to understand the relationship of weaving to Mathematics, in the sense that is possible in a formal education, not only in classes systematized with the contents of didactic books, or the "journal"; succeeding perhaps for moments to not only speak of numbers (the representative symbology of Mathematics), but to see other symbols and meanings that exist in African culture, which go farther than our logical and disciplined vision shows us.

I seek the construction of actions aimed to contemplate and enrich the teaching-learning of Mathematics, through African culture intertwined with Kente cloth.

This article is part of research for a Masters degree, in which the researcher took advantage of the disruption of the barrier of invisibility to difference, practicing respect for diverse cultures, contributing in spaces where traditionally technical operations are privileged, memorization and formal reasoning, and pointing to tools for the development of diversity of thought and creativity.

In short, this article is presented as a proposal of how an African fabric can be used

in a Mathematics classroom, in a public school in Salvador da Bahia, as a transdisciplinary exercise.

From one of the ports of entry of millions of enslaved Africans: This is the place from which I speak.

The city of Salvador has already received references as the "Black Rome", being known as a Brazilian city that has one of the largest Black populations originating from the African continent. It is a city where African philosophy[4] is very present. The ability to adapt, historically constructed by Africans here in Brazil and specifically in Bahia, is presented as that which "permitted Salvador to remain, through to the present day, one of the strongest cultures of African roots in the Americas".

The contours of Salvador, one of the principal ports of arrival of millions of enslaved Africans[5], give visibility to the marks left by the ancestors.

In Bahia, at the end of the nineteenth century and in the first decades of the twentieth century, in contrast with the state mandates of equality, there existed elaborate mechanisms of exclusion of a biological and culture nature intended to prevent the integration of Black people in society, even as it was known that here, firmly established, was a Black world of one of the most solid African cultures.

Since the 1930's, in Salvador, the Black Movement ("o movimento Negro") has fought for an education that incorporated the ideas of the descendents of Africans.

Beginning in the 1950's, the Federal University of Bahia devoted itself to cultural investment – the Museum of Modern Art, Conservatory of Music, School of Theater,

[4] The African philosophy is based on principle of ancestry (tradition), diversity and integration. Ancestry responds by the way in which it houses the set of concepts and categories that show the (innate?) ethics of Africans. Diversity, as a principle, respects the ethno-cultural and political diversity of these communities, valuing the singularities that emerge from each African region. Integration allows diversity to not become a barrier of isolation [...] there is no wellbeing without integration. (Oliveira, 2007, p. 100).

[5] Brazil would have received between 3 and 18 million Africans, between the sixteenth and nineteenth centuries, when the laws against lsave trafficking (1850) and in favour of the abolition of slavery (1888) were enacted [...] The State of Bahia, for example, received notable African influences. Kabenguele Munanga

School of Dance, plus a network of extra-curricular activities from film clubs to the newspaper. At the end of this decade, (1959) there was the birth of CEAO -- the Center for African and Asian Studies -- for study, teaching, research and exchange dedicated to the cultures of Africa and Asia. 36 years later (1995) CEAFRO, a program which extended from CEAO, began with the commitment to establish a dialogue between the Federal University of Bahia (through CEAO), the public school system, and organizations of Black Movement of Bahia. In the year 2000, a project of CEAFRO, the PLURAL SCHOOL PROJECT: Diversity in the Classroom began, informing educators from the municipal district about the themes of race and gender. With the passing of Law 10.639/03, CEAFRO developed curriculum guidelines for the inclusion of Afro-Brazilian and African History and Culture in the Municipal District of Education in Salvador, and is now responsible for the technical and pedagogical guidance for its implementation.

Salvador has always been a leader in the production of resistance, creating alternatives in the social, artistic and educational fields; for example, the Black movements – The Unified Black Movement, Agents of Black Ministers; the Afro blocos – Ilê Aiyê, Male de Balê, Muzenza; and the educational programs – CEAFRO, Steve Biko , among many others.

Diversity is in the classroom: A tour from multiculturalism to the transdisciplinary approach of ethnomathematics.

School is the site of the meeting of different cultures; in that space, they come together, dialogue, shock each other and interact.

Speaking specifically of public school in Salvador da Bahia, we can point out that contrary to the ethnic/racial index of the highest incidence in the state, information referring to European culture prevails in the educational system, to the detriment of Black culture, and not permitting a multicultural education[6].

For Hall (2003), cultural studies and their theoretical legacy require visiting the past in order to consult and think of the present and the future of culture studies. Culture is not

[6] I speak of culture, building upon the concepts of Jamaican Stuart Hall.

only a practice, nor is it just customs and folklore. It constitutes a network of interrelationships.

The author also makes a distinction between multicultural and multiculturalism. He conceives of "multicultural" as a qualified expression, always plural, which describes social characteristics and the problems presented by societies where there is cultural diversity and it is attempted to build something in common, but also retain unique identities. Multiculturalism, he conceives as a noun that is directed to the strategies generated by society. He stresses that, despite multiculturalism being an ancient idea, arising from the 15th century before European expansionism, it is still very questionable today.

> [...] multiculturalism is not the promised land...[however] even in its most cynical and pragmatic form, there is something in multiculturalism that is worthwhile to keep seeking [...] we need to find ways to express publicly the importance of culutral diversity and to integrate the contributions of people of color to the fabric of society. (WALLACE, 1994 apud HALL, 2003, p.52).

Multiculturalism does not have a place in the basic Eurocentric education, as it is in Brazil. In mathematics, for example, we have two very relevant examples; one is the presentation of the characteristics of accuracy, rigor and precision, serving the domination of power and the other is the heroes of ancient Greece, the Modern Age, or the countries of Central Europe, especially England, France, Italy: Tales, Euclides, Pitágoras, Descartes, Galileu, Newton, Einstein, Leibniz, Carnot, Lagrange, Lacaille, J. J. Cousin, Lacroix, Euler, Bézout, Monge, Legendre, Laplace, Delandre, Brisson, among others adopted by the compendium of mathematics courses.

> Education in these molds can only be identified as part of a perverse process of acculturation, through which the creativity essential to being human is eliminated; I would say that this education is a farce. But it is worse because the farce, once the show is over, returns everything to the way it was, while the real education is replaced by a situation that is created to satisfy the objectives of the dominator. Nothing returns to reality to finish the educational experience. (D'AMBROSIO, 2002, p. 14).

Urge a change in the structure of education, and the culture must participate

effectively as a nutritive source in the construction of knowledge, in drafting the language itself, independent of which knowledge will be discussed.

A major challenge is the restructuring of education while examining its tendencies. So, beyond the curriculum and the implementation of affirmative actions, teachers need to have a basis for renovating their knowledge, aware that their role has an effect which extends well beyond the classroom, which can transcend the predominant structure, where there is not culturally privileged space and time that allows judgment and hierarchy – as the most correct or most true – of that which is being discussed.

Corroborating with D'Ambrosio, Hall (2003, p.131) discusses the paradigms of cultural studies and condemns "absolute beginnings":

> In serious, critical intellectual work, there are no "absolute beginnings" and few unbroken continuities. Neither the endless unwinding of "tradition", so beloved to the History of Ideas, nor the absolutism of the "epistemological rupture", punctuating Thought into its "false" and "correct" parts [...] will do. What is important are the significant *breaks* – where old lines of thought are disrupted, older constellations displaced, and elements, old and new, are regrouped around a different set of premises and themes [...] It is because of this complex articulation between thinking and historical reality, reflected in the social categories of thought, and the continuous dialectic between "knowledge" and "power", that the breaks are worth recording. (HALL, 2003, p. 131).

To not permit the 'experience' of the transdisciplinary approach in a mathematics classroom is to continue to have this knowledge in a single disciplinary vision, mechanical, decontextualized, out of time, general and all the other synonyms that can be given to a knowledge that insists on being caged[7].

> The transdisciplinary approach rests on an open attitude of mutual respect and even humility, in regards to myths,

[7] D'Ambrosio makes an analogy, comparing the disciplinary approach to a cage where the bird is trapped, and the transdisciplinary approach as a cage with an open door where the bird passes, enters and exits transcending the area without ranking which is the principal or better space.

> religion and systems of explanations and knowledge, rejecting any kind of arrogance or tyranny. (D'Amrosio, 1997 p. 80)

The transdisciplinary approach, which can be discussed through the curriculum of ethnomathematics, looks for the relationship between different systems of knowledge, where one is not more important than the other. In the transdisciplinary approach, cognition is not hierarchical, and is suggesting an alternative to (overcoming of?) linear thinking, seeking a connection between science and culture.

The "TICAS" of "MATEMA" through "ETNO"[8]

Because ethnomathematics has several strands (streams? lines?), it is important to clarify that the ethnomathematics being addressed is that in the perspective of the Brazilian professor Dr. Ubiratan D'Ambrosio, developed since the 1970s, with international recognition as was reflected in 2005 when he received the international prize of Mathematics Education, the Felix Klein medal given by the International Committee (ICIMI), which will currently be presented in 2008 in Mexico.

In Santos' dissertation (2008), directed by D'Ambrosio, the term "D'Ambrosiana Theory" is used to relate (connect?) enthomathematics to a general theory of knowledge.

D'Ambrosio points out a misunderstanding in the use of Ethnomathematics:

> [...] Even though it arises as a general theory of knowledge – once you study the whole cycle from its genesis, its movement through intellectual and social organization, until its diffusion – the fact that the name suggests a body of knowledge academically recognized as mathematics has taken the curriculum of Ethnomathematics away from its character as a general theory, inclusive and transdisciplinary. Many times the curriculum has [only] been seen as an approach to mathematics education. (D'Ambrosio,1997 p. 16)

This vision reminds us to take care not to cage ethnomathematics, lending it to a single focus, to one discipline or to one method. But the author recognizes that this

[8] "Ticas", "Matema" and "Etno" refer to the roots of the word Ethonomathematics (*Etnomatemática)* in Portuguese; the use of these word fragments invokes a wordplay based on their meanings in Portuguese.

misunderstanding was due to the use of the Greek root *"matema (ta)"* to compose the word ethnomathematics; the author postulates that the [word "ethnomathematics" could have been composed] using roots of other languages, for example *Tupi-Guarani* or *Bambara*, because all cultures, all peoples are in search of explanations to deal with reality -- the modes, technical skills or arts (TICAS) to explain, to know, to understand, and to learn (MATEMA) though natural and socio-cultural reality (ETNO).

What D'Ambrosio calls Ethnomathematics is a curriculum of research in the Lakatosian sense and presents itself as an alternative transdisciplinary educational action. There isn't a rupture, it isn't terminal, it goes forwards like the wefts in a loom.

The Frames of the Loom in Ghana

> Of course, the context and the abstracted myths of natural reality, what we call culture, are essential in the development of these different systems of various codes, symbols and rituals. The representations incorporate reality as artifacts in the same way that myths and symbols do, without the need to resort to coding; they also incorporate reality, but as "mind facts".
>
> D'Ambrosio

The woven strip cloth called Kente is made by the Asante and Ewe peoples of Ghana, and also by the Ewe people of Togo.

For Ross (1998), Kente is one of the most well known fabrics of African weaving, its recognition is international, symbolizing and celebrating a shared cultural inheritance, building a bridge between continents. It is worn and its value recognized, both in Africa and the African Diaspora.

According to Dennis (2004), Kente cloth has its origins in the Gold Coast of West Africa, worn in antiquity only by kings as robes for special occasions. The elite character was lost over time. Its existence as common clothing marked a significant change from its

role in Asante and Ewe culture, when it was specifically royal dress. The learning of how to weave Kente is a legacy that passes from father to son.

> Culture is the movement of ancestry, and ancestry is like a fabric produced on an African loom: the weft of the loom is the horizon of space; the warp of the fabric is the verticality of time. Interlacing the threads of time and space creates the fabric of the world which articulates the weft and the warp of existence. (Oliveira, 2007 p. 245)

The most well known type of loom is the "strip loom" which is made of a simple rectangular frame of wood, constructed by weavers or by industrialized production. It is found in various places in Africa, for example in Nigeria, Mail, Congo and Madagascar.

Structure of a single heddle craft loom.

A Return to the African Continent

> The ancestral time is a time "sieved" of identities (imprints). In each of their domains is enfolded any number of fluid identities, colored nuances of the pattern printed on the fabric of existence. Thus it is not a linear time, thus it is not a rectilinear time. It is a time that recreates, as the memory is only a mechanism for access to ancestry, which is a reference to the present. (OLIVEIRA, 2007, p. 246).

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The Republic of Ghana is a country in West Africa, bordered by the Côte D'Ivoire (Ivory Coast) to the west, Burkina Faso to the north, Togo to the east and the Gulf of Guinea to the south.

The country Ghana that we speak about today is not the same Ghana of the ancient empire. According to Fynn (1975), Ghana was inhabited in pre-colonial times by a number of ancient kingdoms, including the Ga Adangbes on the east coast, the Ashanti Empire and various Fante states along the coast.

Having been colonized by the British, the official language is English; however Ghana has another nine official languages: Akan, Akan, Dagaare/Wale, Dagbani, Dangme, Ewe, Ga, Gonja, Kasem, e Nzema, are among them. And the Hausa language is spoken among Muslims in Ghana, approximately 15% of the population.

Geopolitical map of Ghana

Ghana is divided in 9 regions: Upper West Region (the capital is Wa), Upper East; Northern, (Tamale), Brong Ahafo (Sunyasi), Ashanti (Kumasi), Eastern (Kofonaun), Western, Central (Cape Cost), Volta Region (Ha) and the capital of Ghana, Accra; of these, I was in four: Ashanti, Central Region, Volta Region and Accra.

The oral culture did not allow many of the countries of Africa, including Ghana, to have written history before the end of the nineteenth century. Many events that took place

before the end of the fifteenth century are almost unknown, and still today, there is much outside of what is written that they have to tell.

The World of African Kente Cloth

For some researchers, Kente cloth is the result of various traditions that existed in West Africa before the formation of the Ashanti Kingdom in the seventeenth century.

Archaeological research has dated examples of narrow-strip cloths woven in West Africa around the eleventh century AD and perhaps earlier. Some examples of woven fabrics were found in caves in the cliffs of Bandiagara in Mali. These cloths were used in burial ceremonies, probably, during the medieval empires of Ghana, Mali and Songhai. They have technical and aesthetic characteristics similar to many narrow-strip cloths from other parts of West Africa.

The fabrics called “Nsaa” by the Akan people are part of the royal clothing of the Akan royal courts. Many characteristics of these cloths appear in the narrow-strip weaving of the Ashanti.

. Various fabrics made with the Kente narrow-strip loom

Thus, it is believed that the Ashanti craftspeople learned to weave from peoples who lived to the north and west of them and later developed their original style.

In other parts of Africa, archeological excavations have uncovered parts of looms, possibly from the ancient empire of Meroe, which flourished between 500 BC and 300 AD. In other African civilizations in the Nile River Valley, such as “Kemte” (Egypt) and Nubia or Kush, there is much pictorial and archeological evidence that proves the existence of a weaving industry as early as 3200 BC. (ROSS, 1998).

THE MYTH

Weaving is an art that the craftspeople say began with a spider. It was elaborated and improved upon by the weavers based on their own ways and passed from generation to generation. It is this particular knowledge of the weavers that often determines the type of weaving.

According to Asamoah (1994), the most common myth of the cosmology of weaving is that of the two friends Nana Korangu and Nana Ameyaw, which will be related below:

“According to the tradition of the Ashanti people, Nana Korangu and Nana Ameyaw were hunting. During a walk in the forest, the two hunters saw a spider weaving a web, became curious about what this insect was doing and stopped to watch as he transformed simple threads into complicated patterns. Dazzled by the ability of the spider, each of whose feet executed a different function, they stayed for days in the forest patiently learning.

When they returned to the village where they lived, the hunters showed their new knowledge to the chief. Amazed by what he saw, he went immediately to tell the King Tutu, chief of the Ashanti. The king also was impressed by the webs of cloth, and ordered that from that moment on, these men would weave these bands of silk for the court.

The hunters created a loom that imitated the actions of the spider, and began to weave the fabric that today is known as Kente.”

Kente is a type of weaving, but a fabric exists that was the first known by this name, and according to Nana Akwasi Gyamfi de Bowire[9] and Asamoah (1994) the cloth known today as Kente is an "Adwini nweni ntoma" which means fabric woven by an artist. In the Twi language (an Ashanti language) the word Kente is a combination of two other words – Kete (woven mat) and Kenten (woven basket).

In his interview, the weaver Joseph Amegh of the Volta Region says that the name KEnTE comes from two actions which happen in the moment of weaving: one is KE (which, in the local language, means to thread) and the other is TE (which means to pull). The weaving is formed when the thread is put in and pulled underneath. It is a fast and automatic process of Ke + Te. He concludes that as it was being written according to the pronunciation, it became known as keNte.

Raw Materials

The raw materials used the production of African cloth include: bast fibers, wool, cotton, silk, raffia or bark of specific trees.

- Bast is part of the plant that carries water into the plant; it is a very strong fiber, and therefore is used to make paper and cloth as well.

- Wool is the main fiber used by women weavers of the Berber peoples of North Africa, and by men of Arabic origin who weave in the urban workshops of the region. Apart from North Africa, weaving with sheep's wool is found only among the Fulani weavers of the Niger River in Mali, in Sudan and in Madagascar.

- Cotton has been cultivated for more than a thousand years, across a large part of the Sahel and savanna regions in Africa. Cotton was the principal material of textile production in the region from Senegal to Nigeria, across to Ethiopia.

- Silk was not a fiber commonly used in African textiles. But in the areas where it was used, it had considerable importance. A variety of silk was woven in the nineteenth century in Madagascar. A large amount of the imported silk has a long history.

[9] Nana Gyamfi is the king of all weavers in the Ashanti region; it was he who made most of the Adwini-nweni-ntoma Kente cloth.

- Raffia is produced from younger leaves of several species of raffia palm that grow in the majority of the forested regions of sub-Saharan Africa. The pieces of fiber are cut from the thin upper skin of the leaves, dried in the sun, and then split lengthways with a comb or fingernails to produce narrow flexible fibers.

The Potential of Weaving in the Voices of Teachers

Teachers in the public schools of Salvador that were interviewed about the potential of Kente cloth in the classroom gave answers that point out the transdisciplinary nature of the loom, as well as its transcultural dimension:

"To bring elements of African culture to a classroom not only contributes to enriching the culture of many students, but enriches the classroom by inter-linking mathematics, African culture and art".

"There are many connections that we can make using this cloth. Not only can we talk about geometry, but we are also able to talk about African cultures and myths."

"This work of art can be in the math classroom to teach geometry as much as the formulas that are used. The difference is that our students will identify more with a work of art than a formula; one being tangible and the other abstract, and therefore one can precipitate learning more quickly than the other."

"I will call these fabrics works of art – these works can serve as doors to a new cultural knowledge at the same time that they demonstrate the aesthetics of patterns, numerical reasoning, geometry, but we can not limit it to this…"

"A mathematics lesson that begins by presenting these fabrics, or by students doing it or showing a video of how it is done, what the culture is, who the people are who weave, is motivating because we can being to talk about the history of Africa; after the culture, the art, the literature, we can then go to mathematics. Also we will have the possibility of inviting other colleagues to share the lesson, because these fabrics are not limited in content, what I see is not what my colleague saw."

FINAL CONSIDERATIONS

Corroborating with Marcus Garvey[10], who says that 'a people without history is like a tree without roots', one of the major challenges in education is the restructuring from the roots, valuing history, rethinking cultural relations and myths, based on the need for the inclusion of an education with a basis in the specificities of cultural diversity and a spiraling curricular organization. In this sense, D'Ambrosian theory has much to contribute from the ethnomathematics curriculum.

I emphasize that all aspects of the loom are considered to be of great importance. The experience of a loom in the classroom permits the consolidation of some particularities of African culture, and the influences that the finished cloth can bring to education in the development of a transdisciplinary activity where configurations are constructed, it was shown without any predetermination or hierarchy.

It is with this bias that I suggest a way to work with African culture through the use of Kente cloth in the mathematics classroom.

[10] A Jamaican Pastor who advocated the creation of a Black country free of white domination in Africa, which would receive back all of the descendants of African kidnapped by slave ships.

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PROPOSAL OF A WORKSHOP FOR TEACHERS

AFRICAN CULTURE OF GHANA IN THE MATHEMATICS CLASSROOM

> "Learn from the past, build on the foundations of the past. In other words, return to your roots and build on them for the development, the progress and the prosperity of your community in all aspects of human realization".

The law 10639/03 was enacted so that those responsible for education could look back and see the roots of an African civilization as a way to contribute to the teaching and learning in education.

As simply passing of laws does not ensure their implementation, the proposal of this "workshop" is to contribute to the complexity and the conflict of the challenge of promoting racial equality in Brazil through education and to look for a way to reduce the psychological effects of this inequality and the lack of discussion about cultural diversity and transdisciplinary method in the classroom.

This proposed workshop is based on the experience of the learning generated by the interaction resulting from a common knowledge – which created the culture of Kente from the country of Ghana – through the lens of Ethnomathematics.

Objective:

1- To bring African culture into the classroom;
2- To motivate teachers to think of activities using African weaving;
3- To exercise, in the math classroom, transdisciplinary and transcultural thought.

A loom constructed in the classroom.

Audience: Elementary School Teachers

Methodological Procedure:

Awareness; Construction of a loom; Weaving; Survey of the concepts from the activity; Socialization

Step 1: Awareness

1- Watch a 3 minute video about the Kente loom;

2- Handle the fabric which will be made available, observing the details.

3-Suggest that teachers (trainees) talk about their impressions of the cloth, what most called their attention…

How?

(all material is provided by the trainer)

A – Oral accounts of local history and daily life

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B – Reading texts about the history of African looms

C – Reading children's books of African myths and stories

D – Reading and discussion of texts about: African-Brazilian cultural relations

E – Reading and discussion of texts about the history and culture of Ghana

F – Reading and discussion of texts about African looms in Ghana

Methodological Procedure

1-Divide the class into 5 groups (A, B, C, D, E, F).

2-Distribute one of the items above (A, B, C, D, E, F) to each group.

3-In Group A, each member of the group will tell a story and present a collective history.

In the following groups, each group will discuss the theme among themselves (through materials distributed by the trainer who is presenting the workshop).

4-The group will dramatize the theme in form of a play (music, theater, dance).

Step 2: The Construction of a Loom

1- Make a frame with 3 pieces of wood, with a removable rod (tie with a string or make two holes in the wood that are vertical and support the rod).

2- Mark the center of the rod, this center will pull the thread for a fixed distance a little longer than the dimension of the rod, attach the rod (wood or metal) and secure the thread.

3- Wrap the thread around the rod and bring it around the front 5 cm piece of wood (bring it up and over the rod and back around the front 5 cm piece of wood.)

4- Repeat about 40 times. The threads of yarn will be arranged in the same distance, forming a warp.

Step 3: Weaving

1- Separate the warp threads (first the odd, second the even, third the odd, fourth the even…) using a tongue depressor to make an opening (a shed) through which a shuttle that holds the weft thread can pass. Press the new weft thread with your fingers or a comb.

2- Then separate the opposite set of threads in the warp (odd from even) to create a second opening (shed) to make a new passage for the second weft thread. Press the thread firmly towards the first weft thread.

3- Continue, repeating the first step, then the second, making various motifs.

That's it! You can weave strips using this type of simple loom. Use creativity to make different patterns.

Step 4: Survey and Discussion of the Concepts Raised in this Activity

- Talk in groups about the details of the Kente cloth that were handled during the Awareness step, preferably returning to handle them again, pointing out existing mathematical elements.

- Talk in groups about content that can be worked into the classroom, that was observed during the construction of the loom, and the weaving.

- Plan a lesson with the content raised, both with the cloth and the construction of the loom, and the weaving.

Step 5: Socialization

- Each group must submit a lesson plan.

Materials Needed:

To make the loom:

- 3 pieces of wood, 2 are10 cm long, and 1 is 15 cm;
- 1 round piece of wood, or metal, 5 cm long;

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- 2 tongue depressors;
- ball of thread (knitting or crochet);
- wooden base (optional).

To raise awareness:

Various books and children's stories about the history of Africa;

Different Kente cloths

Copies of photos of weavings

Copies of various texts

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