ICT Profile of Ghanaian Senior Secondary Schools
– Implications for Art Education in Ghana

Paper presented by

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Abstract

Integration of computers into the Ghanaian school curriculum has become widespread in the country's senior and some junior secondary schools. Despite its numerous benefits, however, there are considerable concerns regarding whether School ICT programmes are indeed serving their intended purpose of exposing students to the technological tools that would enhance skill acquisition and promote mastery over subject matter. The paper begins with an examination of the knowledge base of art teachers and views of heads of schools about ICT and art education. It also explores the educational goals of existing ICT progarmmes in Ghanaian Senior Secondary Schools which focus on conventional computing that only enables students to use a narrow range of software that have very little benefit for the Visual Art student in particular. The outcome of the investigations formed the rationale for an intervention meant to expose art students to relevant basic skills that are required to develop their computer literacy skills beyond word processing, ultimately developing their creative thinking skills through information technology. This paper is a presentation on the nature of ICT programmes in the secondary schools and the outcome of the intervention designed to expose students to the appropriate use of ICT in Art Education. The results from the execution of the designed intervention suggest a proper attention to the entire idea of ICT in Ghanaian schools, since it is of tremendous enhancement not only for the teaching and learning of art, but all the subjects studied at the senior secondary school level.

INTRODUCTION

Background to the Study

All over the world, institutions and structures are changing as a result of access to increased amounts of information (Kelly, 1998). For education to really prepare students for success, educators have a responsibility to teach students how to use technology to solve problems in the various fields of study. In a subject like visual art, there is a need to develop an ICT programme which looks at art as an evolving and technologically driven field.

There are two very strong reasons for incorporating technology in the teaching and learning of art. One is the current push toward school and curriculum reform in order to meet the changing needs of our society (Gooden, 1996), the tools for which changes technology provides. The second is the responsibility of educational institutions to provide all students with the skills to compete in a global, technological economy.

Statement of the Problem

The current rise in information and communication technology (ICT) provides new challenges to education. Information technology almost imposes an unconditional incorporation of ICT tools in the teaching and learning process as a means of

preparing students to enter a job market where information technology is pervasive. Consequently, many senior secondary schools in Ghana have managed to acquire computers that are intended to enable them provide their students with basic knowledge and skills in the processing of information via computers.

Unfortunately, the emergence of ICT in Ghanaian secondary schools seem to lack definite goals for teaching and learning and is happening so independently that the extent to which its introduction is benefiting education of the students is uncertain. Apart from using it for 'keyboarding' classes, ICTs hardly affect the teaching and learning of any particular subject directly. In the schools where ICT is considered within the purview of science, the ICT centre becomes nominally part of the science laboratory and is highly under-utilized. Many subjects are therefore looked down upon in matters related to information technology, with art being the most affected. The attempt to introduce ICT into Ghanaian senior schools over the past few years is far from making any meaningful impact in the teaching and learning process. Though the idea of ICT in education has been fully endorsed by policy makers, educators, teachers and many others, it is interesting that so much of its potential is not only unrealised but apparently unrecognised, particularly in what has traditionally been viewed as the creative area of the curriculum – art and vocational skills.

As far as Art Education is concerned, this trend is indeed a great setback in education of the future artist considering the enormous and exciting scope of ICT in art teaching (Davies & Worall, 1997).

An exposure to the basic use of computers for art and the unique role the computer can play in the teaching and learning of art is therefore necessary to provide students with a much broader view of Information and Communication Technology.

Research Questions
The study sought to seek answers to the following research questions:

1   What is the knowledge base and awareness of art teachers in the use of ICT in art?

2.   Do educational goals for ICT in senior secondary schools have consideration for the teaching and learning of visual art?

3.   To what extent can ICT tools be used to support teaching of concepts and skills in Art in Ghanaian schools?

Methodology
The study was in two main phases. It was grounded mainly in the qualitative paradigm, but employed some interventional strategies at the second phase of the study.

Gaining Access

We made a formal request for entering into the schools, and further sort the consent of the participants to be involved in the study

Population

The primary population in this study consisted of senior secondary schools that have incorporated ICT into their curriculum.

Sample and sampling

Ten schools located in the Greater Accra, Central and the Ashanti Regions were selected for the study - four from the Central Region; four from the Greater Accra Region; and two from the Ashanti Region. The criteria for selection were: they run ICT programmes, and they were situated within the three regions that have most of Ghana's grade 'A' schools. This was necessitated by the fact that ICT is a new concept in Ghanaian schools, so it was just important that studies should be conducted in schools where ICT has been on their academic programme for some time.

Sampling Method

The population under study was selected by the purposive sampling technique. This sampling procedure is appropriate on occasions when, based on previous knowledge of a population and the specific purpose of the research, investigators use personal judgment to select a sample. The researchers used their knowledge of the population to judge whether or not a particular sample will be representative (Fraenkel & Wallen 2000). Subjects were selected because of certain characteristics: the fact that they run ICT as well as Visual art programmes, and that some of them are connected to the Internet.

Data collection

The data collected during this study was to enable us to answer the research questions posed at the beginning of the study. The research generally focused on the subjective experience and perception of the research subjects in ICT. The researchers were the key instrument of data collection. Tools used included semi structured interviews, 'conversations', on-site visits and practical teaching to gather data for this study (Fraenkel & Wallen 2000). Additionally there was a document scrutiny of the curriculum and other ICT related materials.

Interviews conducted for the study were informal, and in the form of conversations with teachers, students and instructors of ICT in case study schools. They did not involve any specific type of sequence of questions or any particular form of questioning.

The interviews which were conducted personally by the researchers primarily sought to find out what was taught under ICT and whether the syllabus had any relevance to

the teaching of art subjects. Selected art students and teachers and some school heads were also interviewed to seek their opinion on the content of their ICT syllabus.

Heads of schools were interviewed on school's history on ICT establishments, supply of logistics, use as well related infrastructure goals. The computer instructor interviews were of more technical nature and it involved ICT resources and their usage.

Data Analysis

Transcripts were generated from the semi-structured interviews and conversations. These were then coded and categorized for emerging themes. Maxwell suggests that the main categorizing strategy in qualitative research is coding (Maxwell, 1998). Where necessary verbatim expressions of the respondents were also used in order to report accurately what the participants had said.

Reporting of Results

Results of the study are discussed in the light of the main themes emerging from the study. These included knowledge base of Visual Art teachers regarding ICT and ICT tools in supporting teaching and skills and educational goals of ICT and consideration for teaching and learning.

MAIN FINDINGS

What is the knowledge base and awareness of art teachers in the use of ICT in art?

For most of the visual art teachers interviewed, computers were seen as a set of tools availability which can provide a positive force that would not only promote teaching and learning of visual art, but can build up motivation and sense of worth for teachers and pupils.

Interestingly, most art teachers had little knowledge and skills in the use of computers

> *I don't even know how to move the mouse or cat myself. How am I suppose to teach my students (Verbatim expression of an art teacher)*

Art teachers who have some flair in the use of ICT expressed a lot of concern about the way they are treated when it comes to ICT issues. Most school heads did not see where art teachers come in as far as ICT is concerned. For most of the heads interviewed, art teachers are supposed to be satisfied with the conventional art tools and materials available in their studios. A headteacher in one of the schools commented as follows:

> *Computers are good but I think we should take our time because parents cannot even afford the traditional art tools and materials, let alone computers (Verbatim Comments of head teacher)*

From such comments it seems to be the case that the head teacher was unwilling to support the use of ICT by art teachers. Interestingly there was a lack of enthusiasm and support for the use of ICT in art by some teachers, whose view point was that ICT could not facilitate original works of art. One teacher for instance commented as follows

> *You can call it whatever you want, but I would be the last person to call a work generated on the computer as work of art. A painting without a brush and paint is to me, unthinkable (Verbatim expression of an art teacher)*

Another teacher who seemed exasperated by the support for ICT in art remarked

> *You people [referring to the researchers [are bringing ICT into everything, and now into art. Very soon you would ask us to eat ICT (Comments from an art teacher)*

Besides, art teachers themselves were divided on the issue of acceptability of computer generated art works as 'authentic' works of art. Some, even though are fascinated about the numerous possibilities provided by the computer in art creation, were reluctant to adopt new teaching techniques. Thus a cross section of teacher were unwilling to embrace ICT in their classroom, owing to what was considered as too new a thing to learn

> *ICT is for children. I see students doing so many things on computers and admire them so much. For me however I am too old a dog to start learning new tricks (Verbatim expression of art teacher)*

Some of these teachers are content to stick to the old thing they learnt and would gladly describe themselves as BBC, a Ghanaian acronym meaning born before the time of computer, and therefore an unwillingness to learn about them, or rather a perceived inability in adjusting to the intricacies of ICT in art.

Interestingly, the use of ICT in the classrooms was quite popular among a section of art teachers, who showed eagerness in using it in their lessons. One teacher remarked as follows:

> *I have been very reluctant to do anything manually by way of design or even writing since I learnt to use the computer. When possible, I even use it to teach some concepts in art (Verbatim expression of an art teacher)*

In spite of the interest among some teacher in the use of ICT, low funding   for education and unavailability of computers was hampering its widespread use in schools in Ghana. One of the teachers interviewed commented as follows:

> *ICT has come to serve as a modern tool for visual communication design…My only problem is accessibility as far as our economy is concerned (Art teacher)*

To what extent can ICT tools be used to support teaching of concepts and skills in Art in Ghanaian schools?

This question was evaluated against the background of the potential of ICT in supporting the teaching of concepts and skills in art.

The following issues were explored, and they are discussed below

ICT Centres
In all the 10 schools cited, evidence of responses to ICT involved creating an ICT centre, or dedicating a building to house computers and peripherals. Students were being taken to these facilities when work with computers was needed. These buildings are called Computer centres, IT centres or Computer Laboratories/rooms.

Resources Available to schools
The primary determinants of the quality of ICT usage in Ghanaian senior secondary schools are the availability of computer hardware and software.

Hardware
A basic indicator of hardware availability in schools was the number of personal computers available for students use comprised system units, monitors, keyboards and mouse. Most of the ICT resources in secondary schools are kept in the computer rooms. This pattern was consistent in all the schools.

Hardware Peripherals
Access to peripherals is limited in most of the schools. At best, schools were equipped with colour printers and scanners. There was only one school which had digital cameras and LCD projectors that were used for teaching.

Because schools had few peripherals, students access to these devices were restricted. In all cases, printers were not made available for students' use at all times, because the instructors felt students would misuse them. Students were only allowed to print their work with the express permission and supervision of the instructors.

Computers
The computers used for ICT programmes in all the schools involved in the study were Personal Computers or IBM compatible computers. Each of the schools had between

20 and 50 working computers. Their capacities differ and so are their general performances. No school had a computer classroom furnished with the same brand and quality of computers. Computers available to schools were predominantly Pentium-based, ranging between Pentium 220 and Pentium 4.

Software
The extent of ICT use in schools was highly dependent on the types of software available to users. Two types of software were available to the schools visited. These were Operating Systems and Application programs.

Operating System
Because all the schools use IBM compatible computers, the operating system they learn is Windows. Versions range from 98 to XP, depending on when a particular computer was obtained. The hardware and operating systems platform available in schools implies that school facilities are capable of supporting art programs such as Corel Draw, Illustrator, Photoshop and the like.

Application Software
The Microsoft suit was available to all the ten schools studied. Because this software was installed on all the computers found in the schools, all the ten schools teach word processing, spreadsheet and presentations. The students and instructors interviewed confirmed that word processing receives more attention than the other programs. The interviews revealed that some of the instructors had considerable working knowledge of the program, yet they did not teach it as part of the normal ICT programme. What was happening was that some students had some knowledge and skills that enabled them to use the program for designing. It was realized that some art students knew how to use Microsoft Word, Publisher and Power point to design cards, calendars, etc. In one of the schools, teachers were, apart from the general ICT periods, allowed to use the computers when and where they felt necessary in their specific areas of teaching. According to the graphic design teacher, art students learn basic concepts of colour and typography with MS Word.

Three out of the ten schools tended to offer students greater exposure to a variety of software types. Students in two of the schools had, in addition to word processing software, Internet-related software such as browsers and e-mail software.

Some of the students in all the 10 schools have sound knowledge and expertise in the use of ICT than some of the ICT instructors. This is because such students have access to computers in their homes; some even have laptop computers of their own. The ICT instructor in one of the schools, for example, said he learnt Dream Weaver (for web design) and Adobe Illustrator from a student.

Internet

As at the time of this report, 5 out of the 10 schools were on the Internet, two used to be hooked but no more, and three had not been hooked before but have plans to get hooked to the net. One of them had already acquired a large dish that would enable them have all classrooms and offices hooked to the Internet. The other school was working out plans to link up via the local University. Interviews with selected students in the schools revealed that they knew about the Internet and its use for electronic mail.

The use of the Internet in the schools where the service was available was closely monitored by ICT instructors. This was to ensure that students put the facility to proper use.

Support for ICT Education

All the ICT centres receive a lot of support from local PTA's, Old Boys/Girls and Donor agencies. The ICT centre in one of the schools was provided by the Old Boys' Association with support from two organizations –World Links and International Institute for Communication and Development (IICD). World Links is an organization that promotes project-based, international telecollaboration activities among secondary school teachers and students from developing countries. The International Institute for Communication and Development (IICD) assists developing countries to realize locally owned sustainable development by harnessing the potential of information and communication technologies (ICTs). World Links project donated ten networked computers with accessories and one year Internet connectivity. Africa online provided the internet service. The International Institute for Communication and Development (IICD) through the Global Teenage Project (GTP) also donated three networked computers with one year Internet connectivity. Network Communication Systems (NCS) provided the Internet service.

Five of the schools have received similar assistance from the above programs. At the time of the study, one of the schools had received five computers and a satellite dish from its overseas branch of the Old Boys Association.

In one of the schools, the ICT centre was established by a non-governmental organisation called Institute of Computer Technology (*ICT*), which also provided all the 40 computers and instructors to teach ICT in the school. It was also realised that some other organizations were involved in establishing ICT centres in schools.

This trend gives another dimension to ICT in schools where ICT avails itself as a business avenue for ICT provders. The implications are that, ICT companies are more likely to associate themselves with the 'big' or the so called grade 'A' schools, where it would be possible for them to recoup their investments. It is obvious that if the introduction of ICT in education follows trends of this nature, it can result in the further marginalization of those schools which are already disadvantaged.

General Issues

Certain issues however, run through all the schools' ICT programme, and these have been highlighted as follows::

- Information technology programmes are extracurricular activities.
- Computers are mostly IBM compatibles.
- Word processing is a must and all schools use MS Word.
- Even though there are other application software such as Microsoft Powerpoint, Publisher, and others installed on their computers, the major concern of instructors is how students can do some word processing with MS Word.
- IT centres are originally established by the individual schools with some assistance from the PTA and Old Boys/Girls.
- IT classes are attended class by class at specific periods that have been allocated by school authorities.
- Some students have attained extra skills in computing through private classes and have therefore been exposed to many other application programs.

Do educational goals for ICT in senior secondary schools have consideration for the teaching and learning of visual art?

In evaluating this question we realized that there is no standard syllabus or clear educational goals for teaching ICT in senior secondary schools in Ghana. The syllabus for ICT programmes in all the schools are designed by the instructors themselves. In the case of ICT centres that are run by private organisations, course contents are determined by such organizations

There were no differences in terms of content between the ICT centres run by the schools themselves and those run by private organisations. Even though some of the schools had drawn much elaborate syllabuses, they hardly had enough time to do anything beyond what their colleagues in the other schools do. There was however, a great deal of difference in how the centres function from school to school, and this, to a very great extent, is dependent on the adequacy of computers and quality of staff. It therefore became obvious that school ICT centres which had enough equipment (computers and accessories) function more efficiently than those with limited equipment. Of the ten schools studied therefore, five schools were far ahead of others because their centres are better equipped and programs are well structured. Obviously this had considerable implication for the teaching of ICT in the schools.

Indeed three of the schools did not have any written syllabus at all. The instructors teach students from their experience. What one of the schools presented as a 'syllabus' was simply a content page of the book which the IT instructor uses. This is one evidence of a lack of clear ICT policy or goal directing the integration of ICT into art.

A syllabus obtained from Institute of Computer Technology (ICT) (the organisation which established the ICT centre for one of the schools and many others in Ghanaian secondary schools was used as a yardstick, and the main strands are examined under topics in the syllabus below.

Topics in the Syllabus

      (1)   Computer Systems
      (2)   Hardware:
      (3)   Peripherals
      (4)   Processing devices
      (5)   Storage and Memory
      (6)   Typing
      (7)   Software
      (8)   Introduction to Windows
      (9)   Exploring the Desktop
      (10)   Basic Skills
      (11)   Disk Organisation
      (12)   Windows Applications
      (13)   Application Software
      (14)   Introduction to Microsoft Excel:
      (15)   Internet:

Reference Tools

Some common reference software were identified in some of the secondary schools. Encarta Encyclopedia was available in four of the schools; Comptons Encyclopedia, Comptons Interactive Holy Bible and Webster's Interactive Dictionary Encyclopedia was available in one of the schools. These software are used to support traditional teaching practices. Schools with some reference software sometimes asked their students to search for information. As was evidenced there was no coherent educational goals regarding the use of ICT for teaching visual art and consequently strategies were based on teachers own initiative and theory. This was often problematic because some of the teachers' own knowledge was often at foundation stage.

Summary and conclusion

Many art teachers have limited understanding of the use of ICT in senior secondary schools in Ghana, and this is hampering the promotion of ICT in art. It was also the case that whiles some art teachers report of a burning desire to integrate ICT into the teaching and learning of art, heads and school authorities are reluctant to support the use of ICT in art. This study has also shown that all the schools with ICT centres have access to word processors, spreadsheets, and presentation software. This is consistent with the Microsoft suite. The implication is that schools tend to use ICT to teach computer literacy. Students study ICT as subject, rather than as tools to learn other

subjects. On the whole ICT has considerable potential for teaching art in senior secondary schools in Ghana. The ICT syllabuses of all the schools oblige students to learn keyboarding and word processing throughout their programme. There are however limited opportunities to use the Internet. When and where available, the Internet is predominantly used for e-mail. The syllabuses have no consideration for the visual art, and there is little opportunity to learn drawing, painting, simulations or modeling software.

The limitations on ICT use in schools are largely attributable to lack of proper planning and adequate understanding of the rationale for incorporating ICT tools into teaching and learning. Even so there are no clear educational goals and policy regarding ICT use in schools in Ghana regarding the teaching of art. The few hardware available are kept in computer rooms or laboratories and are manned mainly by ICT instructors, making them inaccessible to non-ICT subject area teachers for instructional purposes. This implies that, in Ghanaian senior secondary schools, students generally use ICT only during "ICT classes"

Intervention of this study with the aim of profiling the use of ICT in selected senior secondary schools in Ghana
As the research progress however, we realized the necessity of attempting to do something about the status of ICT in the school. We wanted to establish whether an intervention with ICT would enable students to paint, draw and use the computer software to generate creative works and patterns of art. Hence the second phase of the present study, the intervention.

The Intervention aimed at providing a general information source for visual art students in Ghanaian senior secondary schools with regards to the opportunities available in the teaching and learning of art. It provided specific instructions on the use of one 'Draw' and one 'Paint' software for basic activities in art. It also involved the deepening of understanding in certain aspects of art such as colour theory, and the elements and principles of art.

How did we set about intervening?
The intervention involved 5 of the initial 10 chosen purposefully on the basis of what we perceived to be schools of the greatest difficulty regarding ICT use and a barely satisfactorily standard. Within the sample frame of the five schools 20 students were randomly selected from students in forms two and three. No student was selected from form one because at the time of the study, form one students had freshly reported and therefore did not have the requisite knowledge in ICT.

The intervention involved a series of practical activities. Practical activities were in two sections: The first section comprised demonstrations and illustrations undertaken by the researchers to explain the tools of the software recommended for art education. The second was made up of students' activities as they practiced the various activities

they had been exposed to. The activities outlined for the intervention were derived from the researchers' practical use of the Personal Computer (PC) in teaching with the application software highlighted in this study.

PROFILE OF THE STUDENTS INVOLVED

These students already had introductory lessons in computing from their 'ICT classes'. They were also aware of the basic components of computers - hardware (the systems unit, monitor, keyboard and mouse) and software (the Windows operating system). They were also conversant with basic operations such as booting, launching a program, creating files, typing, saving, opening files, closing files, exiting programs and shutting down the computer. The students could also practice the skills of clicking and moving of objects. Above all, all the twenty students were visual art students.

Activities

The students were taken through a fortnight training session of two-hour duration at each sitting. They were taken through a broad range of activities for fourteen days. Each activity was provided on each of the fourteen days. The fourteenth day was set aside for appreciating the works that the students had undertaken. The activities included mainly the following

Day 1:
Revision of the Elements and Principles of design
Days 2 & 3 – *Introduction to Corel Draw*
Day 4 & 5 – *Introduction to Adobe Photoshop*
Day 6 – *The Similarities and Differences in Corel Draw and Adobe Photoshop*
Days 7 & 8 – *Practical Activities - idea development.*
Day 9 to13 – *Project*
Day 14 – *Appreciation*

Works were discussed on the screen using an LCD projector. Students' works were discussed in terms of Technical properties, Sensory properties, Formal properties, Expressive properties and Aesthetic properties (Feldman Model). For example:

- Technical Properties: What tools were used and how were they applied?
- Sensory Properties: What are the basic visual elements? (Line, colour, shapes, recognizable figures)
- Formal Properties: How does everything fit together? (Balance, rhythm, contrast, harmony, etc)
- Expressive Properties: How does it make you feel? What emotions are expressed and how?

- Aesthetic Properties: Is it beautiful? Is it of value? Does it communicate even without words?

Students' Projects

All the students had some works to show at the end of the exercise. Only three groups (six students) successfully attempted painting (with Adobe Photoshop). The rest used Corel Draw. However, not all works produced by students have been shown in this report. Some works were lost due to improper saving procedures, and others were too similar to stand alone. The works that have been presented here therefore are those that all the students (the creators and observers including some teachers) accepted as well organized ideas and deserved documentation.
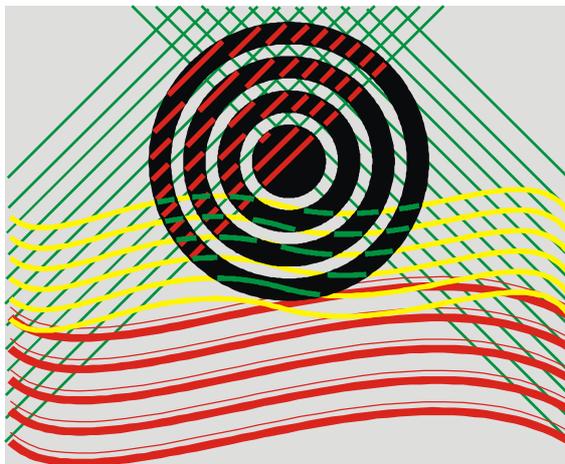
Movement of Lines
Software: Corel Draw
Tools: Ellipse, Bezier, Freehand
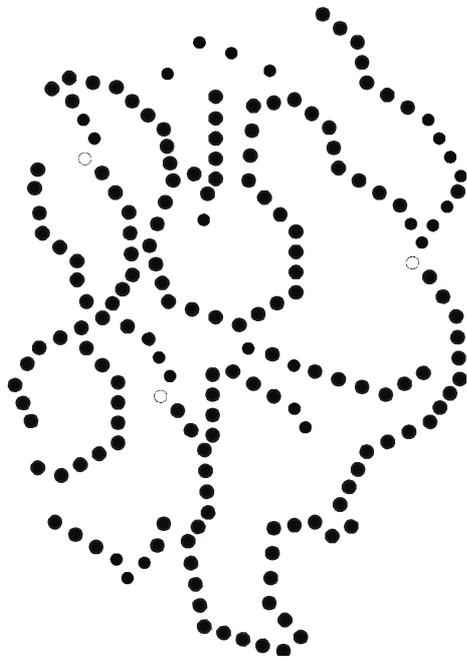
Movement of Dots
Tools: Rectangle
Software: Corel Draw

Harmony of Colour
Software: Corel Draw
Tools: Interactive Mesh Fill
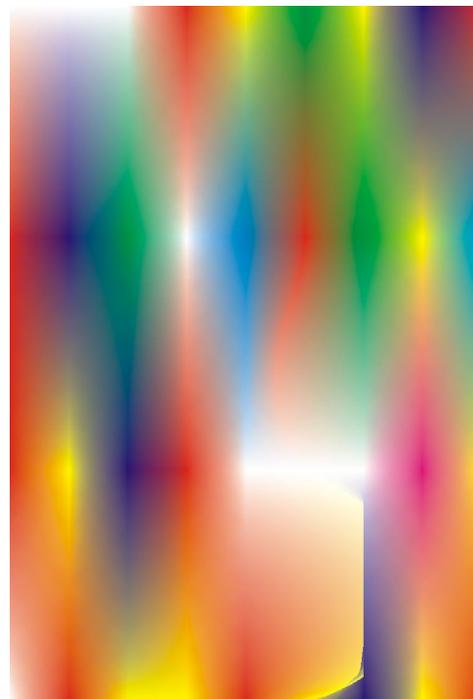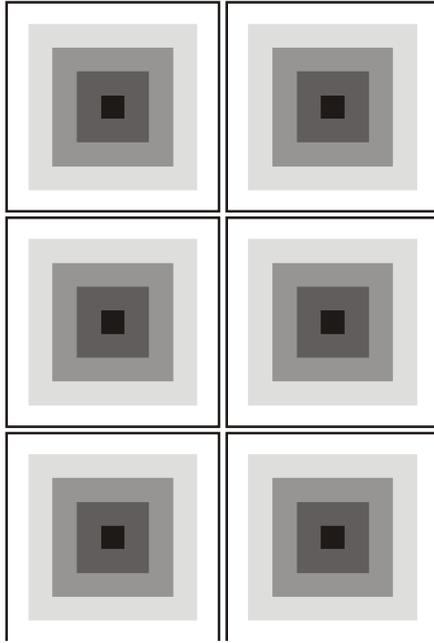
Rhythm/Repetition of Shapes
Tools: Freehand, Ellipse and Bezier.
Software: Corel Draw
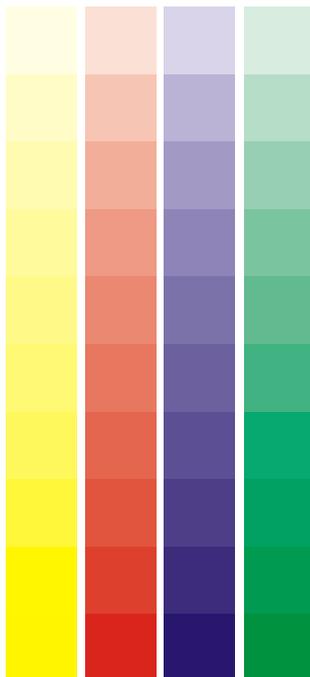
Value Scale

Software: Corel Draw
Tools: Rectangle, Fill Colour Dialog

Method: 4 bars containing 10 rectangles in each bar was created for Yellow, Red, Blue and Green. Only the first of the rectangles in each of the group was filled with the hue. Subsequent colours were reduced in saturation by 10%. Green for example is made up of 100% Cyan and 100% Yellow and it is only the first of the Green boxes which is filled with that pure Green. The next one is reduced to 90% cyan, 90% yellow and so on.
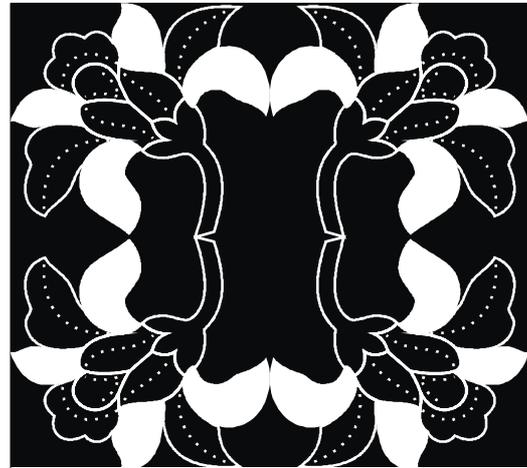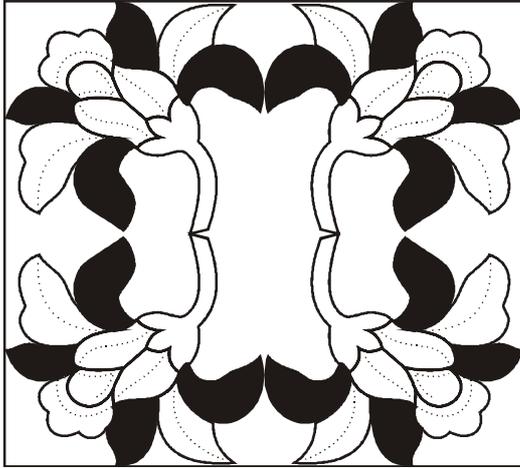
Harmony/Balance

Software: Corel Draw
Tools: Freehand, Shape

Method: These designs are painstaking imitation of a design in a dress one of the students was wearing. After a lot of tiresome efforts, the two designers who came up with it managed to draw one of the motifs with the *freehand* and the *shape* tools. The motif was then taken through a series of duplications, rotations and flipping to form the design. They were guided to present the design in negative and positive.
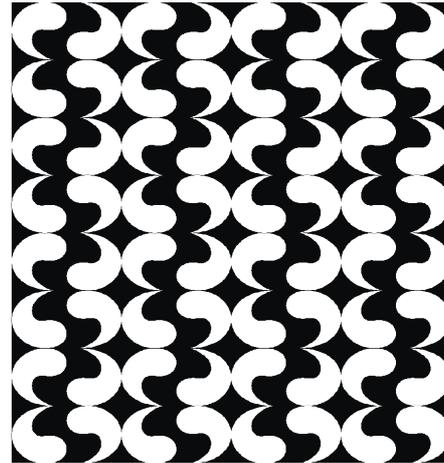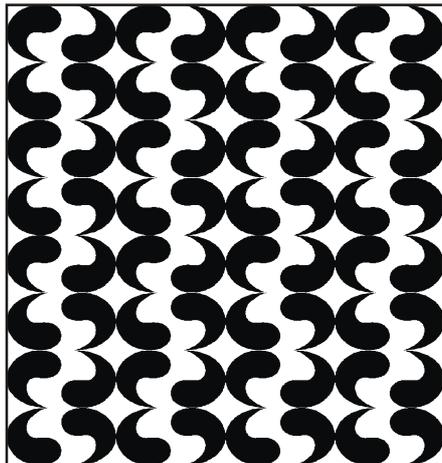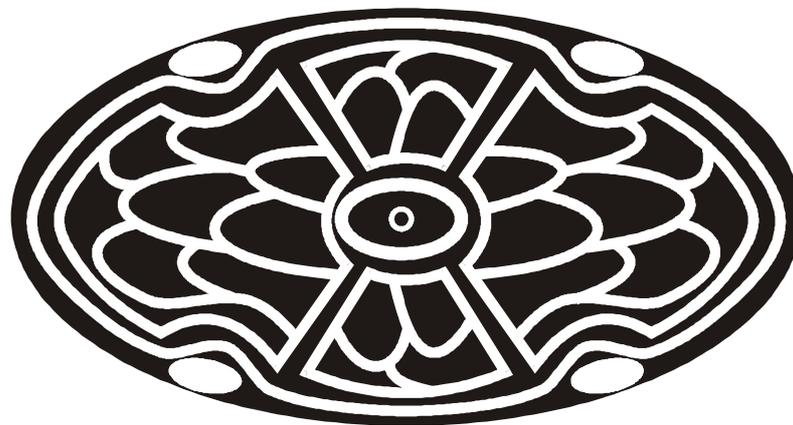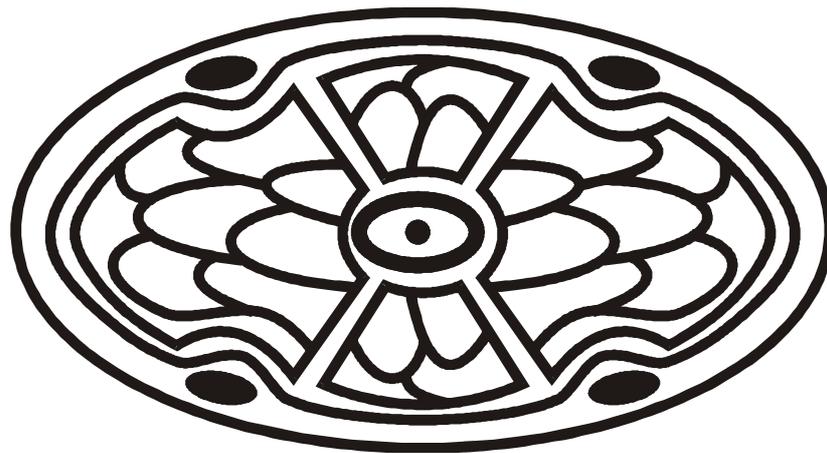

Rhythm/Repetition/ Dominance
Software: Corel Draw
Tools: Rectangle, Ellipse, Shape

Method: One shape was created through the tessellation method and duplicated. Some were flipped upside down. The shapes were then arranged to form the design. The student also presented it in the negative which came out well.


Design from an Orange
Software: Corel Draw
Tools: Ellipse, Freehand, Shape

Method: Originally the students who came up with this design called it 'sweet'. It was actually designed by one of the students in a textile class and decided to work it out with the computer. Because the design is symmetrical, they were guided to develop just one half of it, copied and flipped to the other side to make it whole. The design was also developed in negative and positive.
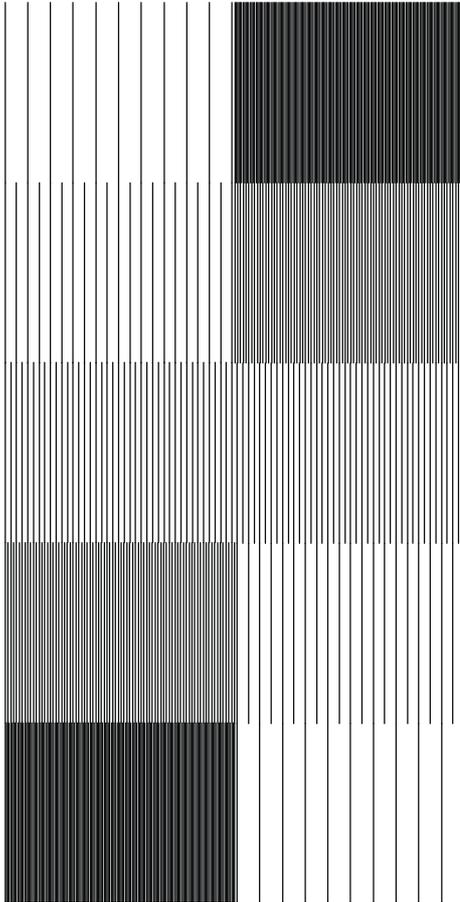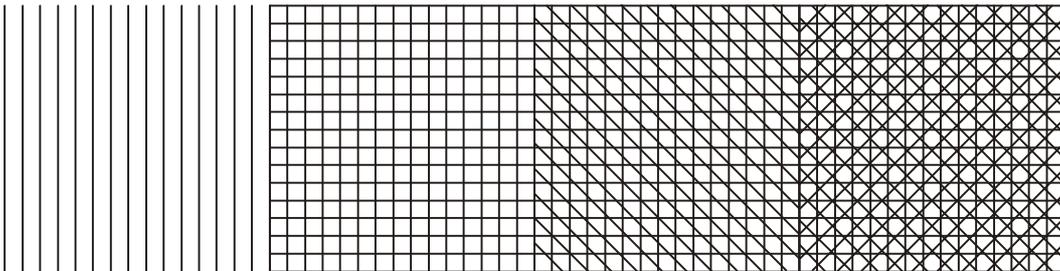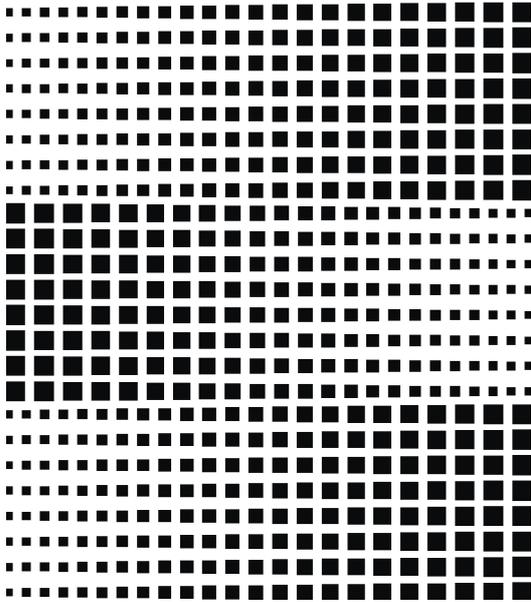
Hatching

Software: Corel Draw
Tools: Freehand

Method: One student produced all the works on this page. She created just one stroke of line and duplicated it at various intervals and orientations.

Pointillism
Software: Corel Draw
Tools: Rectangle

Method: The above design is the idea of pointillism expressed by two students. The design was created by first creating a single rectangular dot with the rectangle tool. This was duplicated progressively. The first dot duplicated was reduced by point one (0.1) and this reduced the subsequent repeated dots progressively by the same difference. The first bar of dots was then duplicated severally to obtain the design.

Balance of Texture
Software: Corel Draw
Tools: Rectangle, Texture Fill

Method: Four rectangles were created with the Rectangle Tool, filled with Texture Fill Dialog and arranged.
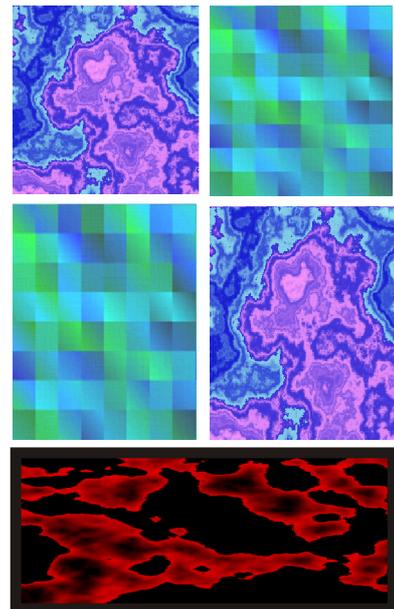
Landscape
Software: Adobe Photoshop
Tools: Paintbrush, Smudge

Method: The paintbrush tool was used to paint, changing colours at various levels. It was finished up with the Smudge tool.
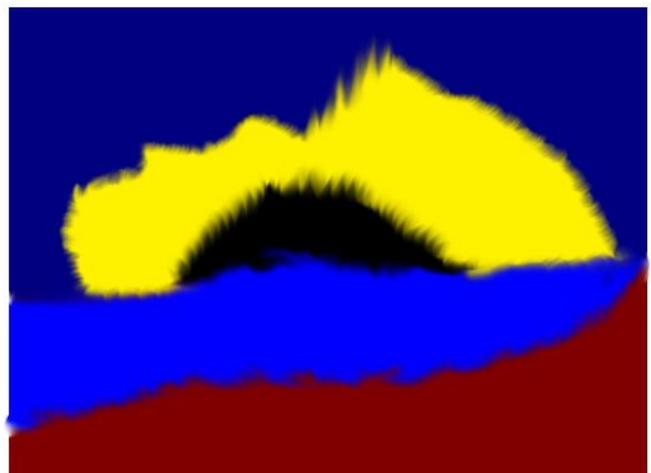
Landscape – Sunset
Software: Adobe Photoshop
Tools: Paintbrush, Smudge

Method: The paintbrush tool was used to paint, changing colours at various levels. The smudge tool was later used to treat the edges.

Landscape

Software: Adobe Photoshop

Tools: Airbrush, Smudge

Method: The two students who produced the two works on this page worked in a group. It was the same idea used for the Landscape (above) which was developed into the Bush Fire (below). In all cases, the application of colour was done with the Airbrush tool. The sizes of brush as well as tones of colour were changed occasionally according to their intended design. The edges were then blended with the Smudge.
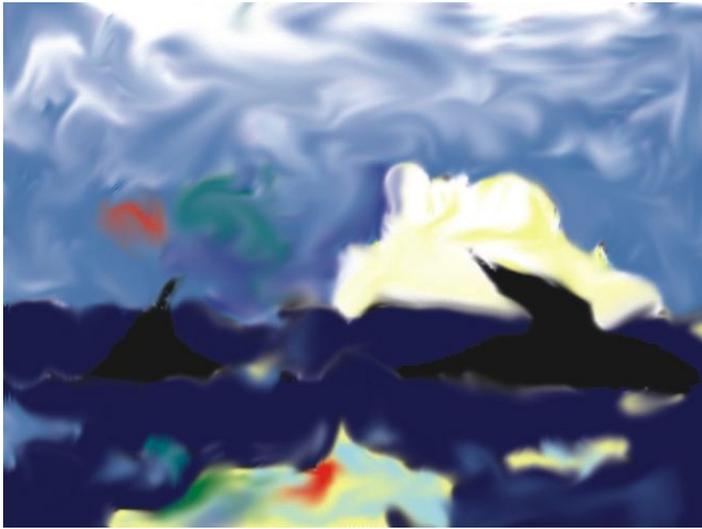
Storm
Software: Adobe Photoshop
Tools: Air Brush, Eraser, Smudge

Method: All paintings were done with the Air Brush. With the background colour at '0' Cyan, '0' Magenta, '0'Yellow and '0' Black in the colour picker dialog, the Eraser was used to introduce some highlights into the design. The edges were then finished up by smudging.

Colour Harmony in contrast
Software: Adobe Photoshop
Tools: Paint Brush

Method: Colour was applied with the paintbrush.
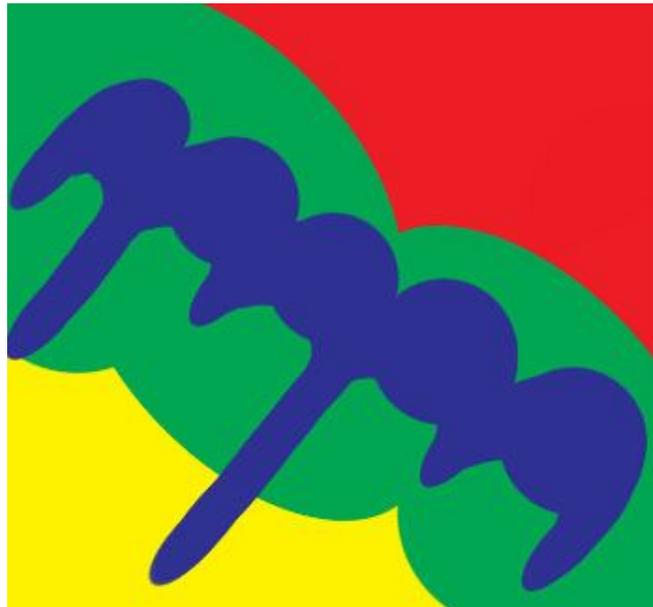
Conclusion

The initial stages of the activities were quite hectic, with many arms being raised for help. With the exception of two students, none of the students had used Corel Draw or Photoshop before and so needed a lot of assistance. We spent a lot of time in the early stages was correcting, directing and assisting. In spite of all that, everyone was highly excited from beginning to the end, and none of the students expressed any desire to quit at any point in time. Throughout the exercises, none of the students was absent for more than one day. Students were given the opportunity to discuss some of the problems they faced whilst working. General advantages and disadvantages they perceived in the use of the computer for the creation of art were also discussed.

Problems

- Mouse control: The common problem faced by all the students was the control of the mouse especially when using the Freehand and the Bezier.
- Time: Students were confronted with too many icons, terminologies, commands and skills to be conversant with within a short time. It therefore became obvious by the end of the entire exercise that the students needed more time to grasp the basic vocabulary of computer art and to master enough skills requisite for meaningful self expressions. In fact most of the objects they produced, even though came from their own efforts were accidentals. In most cases, the researchers helped them to figure out images that could be obtained from their rough works.

Apart from these two major problems, the exercise was successful and it ignited the interest and enthusiasm of students in using the computer in art works.

SUMMARY, CONCLUSIONS AND SUGGESTIONS

The overall evidence from the students' performance in the exercise is that students of art in Ghanaian secondary schools can use the view that the use of computers in schools should go beyond Word Processing or even Internet browsing.

Suggestions

The researchers would therefore like to make the following suggestion:

- Any school that establishes an ICT centre should acquire programs that can be applied across the key learning areas within the school curriculum.

- Where instructors are not conversant, assistance of experienced users need to be sought for specific purposes. For example using Corel Draw or Adobe Illustrator to generate images for design.

The major concentration of ICT should be on the teaching of subject area software, for example, Corel Draw for art students. The general training programme should therefore be very concise and the basic skills should be taught within the first few days of the programme. The following topics are considered enough for the general programme:

Hardware
- Recognition of basic system components and connections (monitor, keyboard, CPU, printer)

Software
- Understanding basic operating system functions or software
- Performing basic word processing operations.

Subject area studies - Art

Identification and uses of categories of application software for Art and design – both Windows and Mac platforms.
- Word Processing/Desktop Publishing: E.g.: MS Word, Corel Word Perfect; Lotus Word Pro,Adobe In-Design, Aldus Pagemaker, Quark Express, or any such program.

- Drawing/Designing: Corel Draw, Adobe Illustrator, Adobe Freehand, Real Draw, Art Expression, Ad Pro, Fractal Design, Alias Sketch, Kai's Power Tools, Proprietory, Aldus Freehand, Ray Dream Designer, Strata   Vision, or any such program.

- Painting/Photo Editing: MS Paint, Adobe Photoshop, Paintshop Pro, Corel Photo Paint, Adobe Fireworks, Prisms, TV Paint, Quantel Paintbox, Colour Studio, Paint   Alchemy, Altsyso Fontographer, Fractal Painter, or any such program.

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