

Prospects and Challenges of Learning Clothing Construction Skills Using Information and Communication Technology (ICT) in Technical Colleges in Anambra State, Nigeria

¹Beatrice Ekwutosi Oluah, ²Chiamaka Adaobi Chukwuone, ²Grace E. Ibems,

²Ifeoma Ngozi Dimelu and ²Anowai Chinwe Christiana

¹Department of Home Science and Management,

²Department of Home Economics and Hospitality Management,
University of Nigeria, Nsukka, Nigeria

Abstract: The study focused on the prospects and challenges of learning clothing construction skills using Information Communication Technology (ICT) in Technical Colleges in Anambra State, Nigeria. The study specifically focused on the benefits of using ICT in teaching and learning clothing construction skills, the problems encountered in using ICT to teach and learn clothing construction skills and the strategies towards enhancing the use of ICT in teaching and learning of clothing construction skills in Anambra State. Survey design was used for the study. A sample of 65 (50 students and 15 Home Economics teachers) were used. Questionnaire was used for data collection while t-test was used to analyze the hypothesis. The study identified the benefits and challenges of learning clothing construction skills using ICT in technical colleges in Anambra State. The result shows that ICT has serious positive impact in learning of clothing construction skills by the student. Some strategies were also identified to enhance the use of ICT in teaching and learning clothing construction. These measures if implemented will make the learning of clothing construction skills in technical colleges in Anambra State effective and meet global best practices.

Key words: Learning, clothing, construction, skills information, communication technology, ICT

INTRODUCTION

Integration of instructional technology in clothing and textile in technical colleges is fundamental to the teaching and learning of basic clothing construction skills. Effective technology integration deepens and enhances the learning process. In particular, it supports active engagement, frequent interaction and feedback. Learning equipped with information and communication technology tools allows the students to be intellectually challenged while providing them with a realistic snapshot of what they are to acquire. This further enhances the relationship between the teacher and the students. The art of teaching is not necessarily concerned with passing ideas, skills and attitude to the learner. Teachers consequently grow into the role of advisers, content expert, coach and mentors. Teaching and learning with computer technology change the ways to reach different types of learners and assesses students understanding through multiple means (Ndomi, 2005).

It is a known fact that no meaningful teaching and learning can take place in an environment that is not

conducive. Observation, experience and numerous studies have revealed that many technical colleges in Anambra State, Nigeria lack adequate instructional facilities and have obsolete equipment. To achieve good results or output, teaching and learning environment need to be conducive and learner friendly. Utilization of good instructional facilities and services are basically a sure way of attaining this. The schools need to be better equipped with good teaching and learning environments, workshops and laboratories. Educational environment possesses a strong influence in the teaching and learning processes because effective learning takes place in an environment that is properly organized. This is especially true in learning construction skills. The need to learn clothing construction skills has essentially, changed during the last century. Before coming of the ready-to-wear apparel industries, learning clothing construction skills were acquired informally through the apprenticeship system. It was an important part of preparing young women for homemaking roles. Individuals learn clothing construction skills at the informal level from their masters and mistress. Consequently, clothing construction skills

were introduced into the formal sector and institutions offer it under the Home Economics programs. Later on, acquisition of learning clothing construction skills was viewed as an important job preparation in the textiles and apparel industry. Now a days, the need to learn clothing construction is related more and more to creative rather than economic issues (Kean and Levin, 2009; Seitamaa-Hakkarainen and Hakkarainen, 2009). Clothing and textile, students appreciate expressive, aesthetic and quality considerations related to self-made textiles and clothes.

The wearing of clothes is exclusively a human characteristic and is a feature of most human societies. The amount and type of clothing worn depend on functional consideration such as the need for covering of one's nakedness, warmth, safety, modesty and to reflect cultural and social meaning not forgetting portraying the aesthetic values of clothing. Clothing is anything worn by human being to cover and beautify the body, Anyakoha and Eluwa (2008) stated that clothing is any study placed on the body to protect, beautify or adorns it. Clothing includes all types of dresses and their accessories such as hats, shoes, bangles, earrings, underwears, hair-dos and even make-ups. Clothing makes use of fabrics and textiles.

Textiles according to Anyakoha and Eluwa (2008) are used for making clothes and other household studies. Textiles are any material formed by weaving, knitting, crocheting and pressing fibres together. Textile is a flexible woven material and consists of network of natural or synthetic fibres that have been twisted into yarn and constructed into cloths. Clothing construction is an aspect of the clothing and textiles education of the Home Economics programme on Nigerian institutions. Clothing construction is a lucrative business as clothing use is an integral part of humans. This is because man cannot do without clothing. Together with food and shelter, it is one of the basic necessities of man. Hence, acquisition on the necessary skill in clothing construction prepares an individual for meaningful and sustainable living. It is therefore, important that training in this important area of study be designed and implemented in line with international best practices of which ICT is one of such tools that could be adopted to make for efficiency in it. The teaching and learning of clothing construction skills thus involve various skills and techniques. Typically, clothing construction skills are taught using individual projects that are completed for personal use. Studies have shown that learning clothing construction techniques can be naturally connected to the collaborative projects. However, it is evident that the students learn both problem solving and clothing construction skills during

these projects. Learning clothing construction skills is a complex and challenging process. Students have to learn how to use several tools (like clothing construction machines) and to understand garment and textile structures in order to execute individual design projects. In most institutions in Nigeria that offer clothing construction there exist the practical challenges of teaching basic clothing construction skills in a limited time to students with widely varying skill levels hence, the need to apply information and communication technology to enhance effectiveness in learning clothing construction skills. This is an important factor that must be taken into consideration for effective teaching and learning of clothing construction skills in technical colleges in Anambra State. For learning of construction skill to be effective there is need for observable behavioural change in the learners.

Learning according to Mayer (2009) is the act of acquiring new thing, knowledge, idea and modifying and reinforcing existing knowledge, behaviour, skill and values. It involves synthesizing different types of information and good orientation. Learning may occur as part of personal development, training, school activities through various tool and technologies. Information and Communication Technology (ICT) tools form an important channel for improving learning. Learning is the activity or process of gaining knowledge or skill by studying, practising, being taught or experiencing something. It is the acquisition of knowledge and skill. For learning to be achieved there must be teaching. Teaching, therefore is the act of giving lessons or concepts on a subject to a class or group of students, Lee (2009). Learning clothing construction skills is based on watching a demonstration and by clothing construction garment details piece by piece (Slocum and Beard, 2005). In this case, the goals and resources of problem solving are initially known. ICT can play an important role in teaching and learning of clothing construction skills. ICT integration in education in different study subjects especially clothing construction skills in clothing and textile is significant. Consequently, these technologies appear in a new role and have become a real theoretical and practical basis for other study subjects as a new practical tool for teaching and learning (Vronska, 2012). As pointed out by Koenraad effective use of technologies is an essential component to the success of improving student learning in 21st century education. Integrating ICT in student's learning could be helpful to streamline lesson preparation, thereby increasing the productivity of teachers. Impact of ICT on learning and teaching indicates that there is the most effective use of ICT in improving the learning experience where teachers have been able to integrate together a

range of technologies such as computers interactive whiteboards and the internet amongso many other ICT tools. Such an integrated approach in scope of hardware, software and connectivity allows educators to develop innovative approaches to learning and teaching processes in developing clothing construction skills, especially, for NCE programmes.

Clothing construction is the craft of fastening or attaching garment parts together using stitches made with needle and thread. Fine hand clothing construction is a high quality tailoring, haute couture fashion and custom dressmaking and is pursued by both textile artists and hobbyists as a means of creative expression. Clothing construction is the activity of making or mending clothes or other things using a needle or thread or using clothing construction machine. Clothing construction, however, goes beyond joining garment parts to include activities likr designing, illustration, pattern drafting laying cutting sewing and finishing. A clothing construction machine known as sewing machine is used to stitch fabric and other materials together with thread. Clothing construction machines were invented during the first industrial revolution to decrease the amount of manual clothing construction work performed in clothing and textile companies. Over the decades computers and clothing construction have developed gradually, change with time, taste and trend but nobody knew that a time will come when both fields will complement each other so well. The market is currently flooded with computerized machines, digitalized machines that needs an ICT skilled clothing maker to operate. Today clothing construction has reached new heights by computer aided methods of design. As a result of which computer industry has got its new customers. Computer technology is making waves in clothing and textile industry from determining textiles weaves to sizing designs. ICT tools are vital component of clothing and textile industry. Computer Aided Design (CAD) programs reduce the demand for manual sketches. New software programs continue to replace old manual skills, going by the wayside of “old fashion” flat pattern construction using pencil sketching and traditional match based pattern sizing is gradually fading away. With ICT tools clothing construction is now an exciting activity. Computer aided design and drafting is the use of computer technology for the process of design and design documentation. Computer aided drafting describes the process of drafting with a computer. The ICT environment provides the user with input tools for the purpose of strengthening design processes in clothing construction, drafting, documentation and manufacturing processes. ICT tools may be used to design curves and

figures in clothing construction in 2 Dimensional (2D) space and curves surfaces and solids in 3 Dimensional (3D) objects.

Although, most clothing construction designers initially sketch designs by hand, a growing number also translate these hand sketches to the computers. CAD allows designers to view designs of clothing on virtual models and in various colours and shapes, thus, saving time by requiring fewer adjustments of prototypes and samples later. Most of the technical colleges that offer clothing and textile, however, still teach traditional designs methods including manual flat pattern construction, draping and line drawing. No doubt, that learning of these methods is essential for having a good idea about clothing construction skills but focus on computer aided designs software can help the students draw, create woven textures, drape models to create patterns, adjust sizes and even determine fabric colours with much ease. By introducing ICT tools in learning clothing construction skills students understand a lot better and try various combinations in their design. This also cuts down time factor and the expected learning is achieved. Though manual design methods are not neglected completely, ICT should be seen as very important in learning clothing construction skills, since, it provides a sound understanding of the methods behind clothing and textile and helps students be part of global practices in clothing construction. Clothing construction skills entail pre-washing, taking body measurement, pattern making, laying, cutting assembling, finishing, pressing, packaging. These can be better achieved with ICT as an instructional tool. ICTs means Information Communication Technology. Information is facts or details about something while communications are methods by which it is delivered as prints or on radio or television. Technology is the practical application of science or the art of applying scientific knowledge to practical problems. According to National Policy for Information Technology, FGN (2014), ICT is any equipment or interconnected system of equipment that is used in the automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. These include computer applications internet and newsprints, radio, television and telephones. In a more elaborate sense, Okpara (2004) saw ICT as the science of extracting, collating, storing, processing, utilizing and disseminating data. ICT material varies and examples include computer, compact discs, digital video discs, satellite communication internet, telephone, radio, camera, electronic mails among others (Aderogba, 2012).

Information and Communication Technology (ICT) encompasses a diverse set of technological tools to identify and organize data and information. It involves a wide range of technologies which include telecommunication, technologies such as telephone, television, video conferencing and computer-mediated conferencing (Kumar, 2012). He also noted that digital technologies such as computer information network such as internet and world wide web and software application are parts of information and communication technology tools which can be applied in teaching and learning of clothing and textiles. ICT tools that can be used as instructional material include: computers which have become important in data processing-telephone, radio, television, often done through the satellite. The internet, mobile telephone, Voice Over IP telephony (VOIP) satellite communications and other forms of communications. WB (2009) reported that ICT consists of hardware, software, network and media for the collection, storage, processing, transmission and presentation of information. Olayanju (2010) asserted that ICT is fast gaining prominence and becoming the most important element defining the basic skills of learners and students. Information and communication technology tools are however, yet, to be applied in the teaching and learning clothing construction skills in clothing and textile.

ICT tools can be utilized in teaching clothing construction in the following ways: Use the computer to draft patterns suitable for different figures rather than traditional pattern drafting methods. Use sites like pattern review and burda style as communities and resources to teach techniques and have access to other people who sew across the globe. They teach comprehensive clothing construction from novice to expert. Use of YouTube to demonstrate skills in various aspects of clothing construction. Use iPhone, iPad touch application to help students practical work. Google and other search engines to search for design ideas and new skill in clothing construction among others. Practical sessions can be augmented with videos of such practical in a real life setting. Skype can be used for online classes and to share ideas from other experts from across the world. Use of the Blog to teach clothing skills and share ideas information and skills. Despite the gains in the use of ICT in education, however, teaching and learning of clothing construction skills is still based on analogue method which entails manual demonstration of skills using tapes, scissors, clippers, yard sticks among others. These traditional methods waste time, generate large quantity

of fabric wastes and scraps and are inaccurate if not properly done. Furthermore, the use of information and communication technology enhances both practical and theoretical teaching and learning of clothing and textiles for instance, 3D full body scanner takes full body measurement in 12 sec, iPhones, iPad, YouTube and fashion review teach comprehensive clothing construction. Similarly, Igbo and Iloje (2013) also noted that computers are also used to design clothing items draft and print patterns as they make clothing construction exciting and interesting. Hence, the bases for this study, to identify the prospects and challenges of using ICT in learning clothing construction skills in technical colleges in Anambra State. Specifically, the study sought to:

- Determine the benefits of using ICT in teaching and learning clothing construction skills
- Determine the problems encountered by the students in using ICT to learn clothing construction skills
- Determine the strategies for using ICT to enhance learning of clothing construction skills in technical colleges in Anambra State

The study will form a baseline data on the use of information and communication technology in teaching and learning clothing construction skills in technical colleges in Anambra State. The technical college administrators, teachers and students will now deem the use of ICT in teaching and learning worthwhile. The findings of the study will provide information that will help to improve teaching and learning of clothing construction skills in the technical colleges and attract more students to the subject. Information and communication technologies do not only encourage teachers and students in terms of education but also motivate them especially, students in positive directions. If effectively utilized it will go a long way in helping to arouse and sustain student's interest in clothing and textile an area that most Home Economics students are not keen to go into due to its rigorous and consuming nature.

MATERIALS AND METHODS

Design: A survey research design was adopted for this study. A sample of 5 technical colleges was randomly selected from the 12 technical colleges in Anambra State that offer Home Economics. A simple random sample of 10 students each, offering Home Economics were selected

Table 1: Mean ratings and Standard Deviation of respondents on the benefits of using ICT in teaching and learning clothing construction skills

Item statement	Mean (X)	SD	Remarks
The LCD screen of the computerized machines helps the students to visually control the clothing construction as it is been sewn	3.98	0.14	Agreed
A lot of digitalized decorative stitches enables the students to access several automatic button holes within a short time	3.14	0.35	Agreed
Threading in computerized machine is very simple for the students to understand	3.48	0.50	Agreed
The device for winding a thread on spool on computerized machine does it very fast and neat	3.66	0.47	Agreed
Modernized shuttle in computerized clothing construction machine makes it easy for the students to learn thread shuttling	3.20	0.40	Agreed
The students find it easier to control the machine using buttons on digital sewing machines	3.68	0.46	Agreed
Buttonholes are easier done using ICT tools than the manual method	3.06	0.23	Agreed
The use of electronic pedal make pedalling easy for the students. Some digitalized machines do not pedal. They are automatic	3.46	0.50	Agreed
Hemming is faster using electronic clothing construction machine that selects the hem width and the stitching line using computer	3.12	0.32	Agreed
Seam finishing is faster for the students to learn using ICT tools	3.02	0.15	Agreed
Using discussion forums available to the students on the internet students can easily share ideas and information across the globe	3.12	0.24	Agreed
Students can easily capture and edit digital photos of materials as samples and design patterns using ICTs	3.16	0.48	Agreed

Table 2: Problems encountered in using ICT in the teaching and learning of clothing construction skills

Item statement	Mean (X)	SD	Decision rule
Inadequate number of ICT skilled staff, personnel or support staff	2.80	0.56	Agree
Lack of adequate ICT teaching tools in teaching clothing and textile	3.80	0.41	Agree
Non provision of ICT practical equipment or lab by the school authorities	2.73	0.59	Agree
Teachers lack of interest in using ICT tools as a teaching tool	3.81	0.57	Agree
Students irregularities in attending clothing and textile practical lesson	3.87	0.35	Agree
Poor perception of the teachers on the use of ICT tools in teaching clothing construction skills	3.60	0.73	Agree
Too difficult to integrate ICT use into the curriculum	3.89	0.64	Agree
Insufficient technical support for teachers	2.98	0.78	Agree
Lack of pedagogical model on how to use ICT for learning clothing construction.	3.84	0.51	Agree
Lack of adequate skills	3.90	0.61	Agree
The inability of the school authorities to adequately equip clothing and textile laboratory with ICT tools	3.98	0.24	Agree
Insufficient number of computers and other ICT tools	2.64	0.38	Agree
The inability of the teachers to effectively use ICT tools in teaching clothing construction skills	3.90	0.61	Agree
Limited time allotted to clothing construction in the time table that effects its effective teaching and learning using ICT to be achieved	2.78	0.42	Agree

from each of the five technical colleges giving a sample of 50 students. Also, a sample of 3 teachers each was randomly selected from the five technical colleges giving a sample of 15 teachers.

Area of the study: The study was conducted in Anambra State, Nigeria. Anambra state is one of the educationally advantaged states in Nigeria. It has colleges of education where teachers are prepared for teaching job. Furthermore, technical colleges in Anambra State offer clothing and textile as an integral part of the and Home Economics and curriculum.

Instrument: The researcher used a self-developed questionnaire titled: Learning Clothing construction skills using Information and Communication Technology Questionnaire (LSSICTQ) which is made up of 36 items arranged in three tables which were structured in line with the objectives of the study. Table 1 consisted of ten items on the benefits of using ICT in learning clothing construction skills, Table 2 consisted of 6 items on the problems encountered by the students in using ICT in

learning clothing construction skills. Table 3 consisted of 6 items on the strategies for enhancing learning of clothing construction skills in technical colleges in Anambra State. Items with mean score value of 2.50 and above were regarded as agreed while items with mean scores below 2.50 were regarded as not agreed. Three Home Economics experts, from University of Nigeria, Nsukka (UNN) validated the instrument. 10 students and 5 teachers in technical colleges in Enugu State which were not part of the study area but have similar characteristics with the area of study were used to test the reliability: the data yielded a reliability coefficient of 0.78. This coefficient was considered adequate for the study.

Method of data collection: A note containing the main and specific purposes of the study was attached to each copy of (LSSICTQ). The researcher distributed the (LSSICTQ) to the respondents and collected the instrument the next day. All the (LSSICTQ) were filled and collected, giving a 100% rate of return.

Table 3: Strategies for using ICT to enhance learning of clothing construction skills in Technical Colleges in Anambra State

Item statement	Mean (X)	SD	Decision rule
Parents and teachers should encourage the students to have a positive attitude towards learning clothing construction using ICT	2.98	0.76	Agree
The government should employ competent teachers with ICT knowledge	2.70	0.64	Agree
School authorities should provide adequate ICT facilities in technical colleges for teaching clothing construction skill	3.18	0.44	Agree
Enough time and space should be allocated for effective teaching of clothing construction skills	3.02	0.97	Agree
Clothing and textile teachers should try and retain the student's interest during clothing and textile practicals by using ICT to teach	2.74	0.44	Agree
Teachers should ensure that the practical lessons on clothing construction skills are made more effective and interactive using ICT tools	3.40	0.92	Agree
School administration should promote the use of ICT by proper motivation of teacher that use it to teach	3.33	0.81	Agree
Clothing and textile teaches should acquire ICT skills by going for skill training and retraining in ICT and related reas of study	3.21	0.87	Agree
Clothing and textile teachers should plan their practical classes in such a way that ICT tools can be utilized in the classes	3.00	0.88	Agree

Method of data analysis: Mean and standard deviation were used to analyze the collected data. The t-test statistics were used to test the hypotheses at 0.05 level of significance.

RESULTS AND DISCUSSION

Table 1 reveals that all the twelve items are the benefits of ICT on learning clothing construction skills by the students, since, the mean scores are above 2.50 cut-off point set for the study. This shows that these items are what the students achieved through effective use of ICT in learning clothing construction skills in technical colleges in Anambra State. Table 1 also reveals that there is no significant difference between the mean responses of the students and the impact of using ICT in learning clothing construction skills.

Table 2 reveals that all the fourteen items are the problems encountered by the students in using ICT to teach clothing construction skills, since, the mean scores are above 2.5 cut-off point set for the study. This shows that these problems limit the teacher’s effectiveness in using ICT in teaching clothing construction skills in technical colleges in Anambra State. Table 1 also reveals that there is no significant difference between the mean responses of the students and problems encountered by the students in using ICT to teach clothing construction skills.

Table 3 shows that all the nine items on strategies for using ICT to enhance learning of clothing construction skills in technical colleges in Anambra State were all accepted by the respondents. This shows in their mean scores of above 2.50 cut-off point set for the study. This shows that these strategies can help both the teachers and the students in using ICT in teaching and learning clothing construction skills in technical colleges in Anambra State.

The present study determined the prospects and challenges of information and communication technology in learning of clothing construction skills in technical colleges in Anambra State. The study revealed that though ICT has positive impact in learning clothing construction skills, there are a lot of challenges faced by both the students and teachers in using ICT in learning clothing construction skills in the area of study. The finding in Table 1 revealed that with computers there is a serious improvement in using ICT in learning clothing construction skills, hence, there is still need for serious improvement in the areas of designing curves and figures in two and three Dimensional (2D and 3D) spaces. The findings in Table 2 revealed that most of the technical colleges in Anambra State are not computerized due to inadequate fund and poor electricity supply in the country. There is also lack of an integrated system of computer software in making of clothing to enable efficient teaching and learning of clothing and textiles in technical colleges. Jun-Ming and Wang (2011) stated that computer-aided production system which involves body dimension collection, pattern generation and fabric cutting has not been employed in fashion and design industries even in institutions. Computer-aided production system can improve not only customer’s satisfaction and manufacturer’s profit but also improve teaching and learning of clothing and textile in technical colleges in Anambra State. The finding is also in line with Helaludin that the major obstacle to the use of technology in developing countries is that information and communication technology is not effectively adopted. Liu (2005) also maintained that both students and teachers lack skills and knowledge in ICT to increase creativity and productivity especially, in practically oriented courses. Computer software used for the preparation of education document and curriculum development are rare in technical colleges of learning (Nicola, 2014). Table 2 also

revealed that inadequate number of clothing and textile teachers in technical colleges who possess ICT skill, Lack of adequate ICT teaching tools in teaching clothing and textile, Non provision of ICT practical equipment or laboratory by the school authorities, students lack of interest in using ICT tools, students irregularities in attending clothing and textile practical lesson, poor perception of the teachers on the use of ICT tools in teaching clothing construction, difficulty to integrate ICT use into the curriculum insufficient technical support for teachers, Lack of pedagogical model on how to use ICT for learning clothing construction skills inter alia are the problems experienced by the teachers in using ICT to teach clothing construction skills. The findings in Table 3 revealed that the following strategies, parents and teachers should encourage the students to have a positive attitude towards learning clothing and textile using ICT, government should employ competent clothing and textile teachers with ICT knowledge skills and attitude, school authorities should provide adequate ICT facilities in technical colleges for teaching clothing construction skills, Enough time and space should be allocated to clothing courses in the school time table for effective teaching of clothing construction skills, clothing and textile teachers should try and retain the students interest during clothing and textile practical by adopting ICTs in their classes, teachers should ensure that the practical lessons on clothing construction skills are made more effective and interactive using ICT tools thereby enhancing learning of clothing construction skills in technical colleges in Anambra State. The implication of this present study underscores the need for installation of functional ICT in Home Economics Department of technical colleges in Anambra State to facilitate the teaching and learning of clothing and textiles in technical colleges in Anambra State.

CONCLUSION

The impact of Information and Communication Technology (ICT) in the past decades has been enormous in the improvement of teaching and learning. Tosun and Baris (2011) opined that information and communication technologies are significant catalysts in the restoration and development of technical education especially, practical oriented courses like clothing construction. The finding of this present study concluded that presently information and communication technologies are not effectively used in teaching and learning of clothing construction skills owing to challenges faced by the teachers and the students. There were no statistically

significant differences in the use of ICT and the challenges faced by the teachers and the students in teaching and learning of clothing construction skills in technical colleges in Anambra State.

RECOMMENDATIONS

Curriculum for training of teachers must include basic ICTs and computer mastery. Teachers of clothing and textile at all levels of education should avail themselves of opportunities available to acquire basic ICTs skills. The promotion requirement of the teachers from one cadre to another should include computer literacy. Curriculum improvement effort should be encouraged by the government to ensure successful integration of ICT into teaching/learning processes in Nigerian schools. Computer hardwares, software's and video projectors should be provided to schools by the government. There should be at least one computer and data projector in each classroom and the entire classroom equipped with smart boards and other ICTs. Teachers and students should be given laptop computers for individual uses. The technical college administrator/management should be well focused and support the use of ICT in teaching and learning, so that, students will show positive attitudes towards using computer program in learning clothing construction skills.

REFERENCES

- Aderogba, A.A., 2012. The use of information and communication technology for qualitative science education in Nigeria secondary schools. *Ikene J. Educ.*, 2: 8-15.
- Anyakoha, E.U. and M. Eluwa, 2008. *Homa Management for Secondary Schools and Colleges*. African First Publishers Ltd., Africa.
- FGN., 2014. Nigerian national policy for information technology (it): Use it Federal Republic of Nigeria. Federal Government of Nigeria, Federal Republic of Nigeria, USA.
- Igbo, C.A. and C.I. Iloeje, 2012. *The Basics of Dress Pattern Drafting* Enugu. 2nd Edn., Inselberg (Nig) Ltd, Enugu, Nigeria.
- Jun-Ming, L. and M.J.J. Wang, 2008. Digital Human Modeling and Scanner-Based Anthropometry. In: *Handbook of Digital Human Modeling: Research for Applied Ergonomics and Human Factors Engineering*, Duffy, V.G. (Ed.). CRC Press, Boca Raton, Florida, USA., pp: 907-917.
- Kean, R.C. and C.O. Levin, 2009. Orientations toward home clothing construction. *Clothing Text. Res. J.*, 8: 28-34.

- Kumar, P., 2012. Information and communication technology in textile engineering college libraries of Haryana, India. *Inf. Knowl. Manage.*, 1: 7-16.
- Lee, N., 2009. Project methods as the vehicle for learning in undergraduate design education: A typology. *Des. Stud.*, 30: 541-560.
- Liu, M., 2005. The effect of a hypermedia learning environment on middle school students' motivation, attitude and science knowledge. *Comput. Sch.*, 22: 159-171.
- Mayer, R.E., 2009. *Multimedia Learning*. 2nd Edn., Cambridge University Press, New York, USA., ISBN:978-0-521-73535-3, Pages: 305.
- Ndomi, B.M., 2005. Revisiting the learning experience of technical college farm machinery curriculum for empowerment of recipients in Nigeria. *J. Niger. Assoc. Teachers Technol.*, 5: 88-94.
- Nicola, D., 2014. 3D body scanning technology with application to the fashion and apparel industry. *FIBRE2FASHION.COM.*, Mumbai. <https://www.fibre2fashion.com/industry-article/1693/3d-body-scanning-technology?page=3>
- Okpara, F.O., 2004. Modern information technology and the RE-engineering business organisations in Nigeria. *Knowl. Rev.*, 2004: 119-122.
- Olayanju, A., 2010. Information and com: Tech in vocational education; A challenge to Nigeria association of technology. Federal Ministry of Education, Nigeria.
- Seitamaa-Hakkarainen, P. and K. Hakkarainen, 2001. Composition and construction in experts' and novices' weaving design. *Des. Stud.*, 22: 47-66.
- Slocum, A.C. and C.A. Beard, 2005. Development of a CAI module and comparison of its effectiveness with traditional classroom instruction. *Clothing Text. Res. J.*, 23: 298-306.
- Tosun, N. and M.F. Baris, 2011. Using information and communication technologies in school improvement. *Turk. Online J. Educ. Technol.*, 10: 223-231.
- Vronska, N., 2012. Information and communication technologies integration skills in household and home economics education. Ph.D Thesis, Latvia University of Life Sciences and Technologies, Jelgava, Latvia.
- WB., 2009. *Expanding Opportunities Building Competences for Young People: A New Agenda for Secondary Education*. World Bank, Washington, DC., USA., ISBN:978-0-8213-6170-2, Pages: 332.