Innovations

Computer–aided Instruction needs for Clothing and Textile students in Nigeria's Tertiary Institutions

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Abstract
The need for adoption and use of Computer–aided Instruction (CAI) technology in Clothing and textile education is an innovation and crucial step in the right direction towards training future labour force needed for apparel industry. The study was to find out the extent of lecturers' awareness, instructional resources and ascertain CAI needs in pattern making to further the teaching and learning of Clothing and textile in Nigeria tertiary institutions. A hypothesis was tested in the study. Descriptive survey research design was used for the study. Population was 233 respondents. Eight tertiary institutions were randomly selected. All the seven lecturers and 68 students of clothing and textiles in the selected institutions were used. Questionnaire was used to collect data and analysed using percentages, mean, standard deviation and Analysis of Variance (ANOVA). Findings showed that lecturers are highly aware of the use of CAI in pattern making in clothing and textiles but do not use it in instruction. Instructional resources and pattern making skill needs were identified. Therefore, CAI will expose lecturers and students to skill training and usage. It was recommended that training and CAI technology be provided for effective instruction to meet global competitive requirements.

Keywords: 1.*Computer-Aided, 2.Instruction, 3.Clothing and Textile education, 4.Clothing and Textile students, 5.Tertiary Institutions.*

Introduction

The advancement and innovations in clothing and textile industry has brought changes in fashion and clothing market in recent time. The 21st century explosive technological breakthrough in Information Communication Technology (ICT) necessitated Computer-aided Manufacture (CAM), Computer -aided Design (CAD) and Computer -aided Instruction (CAI) in apparel development. Udoh (2010) noted that information communication technology (ICT) is an engine for sustainability of development for survival in the changing global environment. The Federal Republic of Nigeria (FRN) in National Policy for Information Technology (2001) described ICT as any interconnected equipment automatically used to acquire, store, manipulate, display and transmit information to be specifically or generally used. This includes computer, satellites, fiber optic cables, telephones, facsimile machine, hardware, software, among others. (Anerua&Azonuche, 2010; Udoh. 2010, Tongur et al, 2008).

Computer Aided Instruction (CAI) eases the learning process in education both at home and school. Cingi (2013) citing Wikipedia stated that computer aided instruction was originally develop in 1963 to teach Mathematics and Reading to elementary young school children in East Palo Ato, California. Computer aided instruction involves the presentation of instruction (teaching and learning) in a computer. It is a remediation

which severally improves the teacher's instruction (Azonuche 2015; Jinajai&Rattanavich, 2015). CAI promotes teaching and learning abilities of lecturer sand students, helps source out information and attain skills and competencies in Computer aided design (CAD) to meet the demand of apparel industry. Computer aided instruction usually involves interaction and enabling in the illustration of concepts in teaching/learning through sound, demonstration, ammunition, pictures and words.

In Computer Aided Instruction, Computer Aided Designs are utilized as important tools to develop garment. This system allows the generation of design and integration between product development systems (Istook, 2000). The conventional garment development process starts with body measurement, pattern making, cutting and sewing. In this study focus is on computer aided instruction needs for pattern making in tertiary institutions for flexibility, creativity, innovativeness to meet demands in labor market and growth in the workplace. It can be noted that clothing and textile education in tertiary institutions importantly require technological advancement and computer literacy in this field of specialization for innovation and global competencies. In clothing and textile education students are equipped with potential intellectual competencies for self-reliance and ability to render services in government work and industries.

Clothing and textile education involves the study of fibers, fabrics, clothing development and maintenance. In apparel development pattern making is manually drafted and the process is seen by lectures and students as cumbersome, time wasting, difficult to learn and follow instructions. Patterns are foundation body form made from body measurements. In this era of Information Communication Technology the use of Computer aided resources in teaching pattern making in clothing and textiles is a modern method innovation approach. This advances and prepares professionals who can compete and meet the technological global demand in garment development. Glock & Kunz (2005) buttressed that Computer aided instruction is increasing in clothing and textile education and competitively in the business of various apparel industries. This innovation makes and allows teaching and learning process to be more efficient and extensive. The use of CAI in pattern making engages the learners in a self – directed learning in garment making technology with needed tools. The tools and equipment needed to access the computer – based learning strategies include: world wide web (www), compact disk (CD), CD- ROM (read only memory), among others. They are present in so many hypertexts, multimedia programs. Wikson et al (2000), highlighted some method used in Computer aided instruction to include; tutorials demonstrations, self help, simulations, integrated learning activities, among others.

The present computer age necessitates innovation in pattern making in school to increase learner's capabilities in both theory practical activities in garment development. CAI retools pattern development approach for human capital development. Ross (2001) explained the need for Computer aided instruction in pattern preparation, grading, alteration, adaptation and marking patterns using software, hardware and communication gadgets. To develop patterns, learners need Computers aided design (CAD) sever, computer color graphic display – high resolution, input, output, software, communication devices, drafting, laying out and cutting equipment (Azonuche, 2020; Azonuche, 2015; Stjepanovic, 1995). Examples of the devices are video, camera, projector, mouse, television, keyboard, digital scanner pattern plotter, color video, color printer, photographic, pattern spreading labeling and cutting machine.

Block pattern making in computer aided instruction starts with taking accurate body measurement, feeding the body measurements into the computer as spelt out by the software package. Follow the instructions in the software and plot pattern pieces, label pattern makings, add seam allowances, package and store properly.Aldrich (2004) pointed that pattern can be manipulated into different sizes and styles. Three-dimensional (3D) body scanners are used to get the accurate graphic body shapes of individual which are downloaded for processing in pattern development. The developed patterns are sent to the automated cutting machines which cut out different pattern pieces needed for garment. In south –south Nigeria's tertiary institutions the three-dimensional body scanner is not available. The South-South is a geo-political zone that consists of six states in the Southern region of Nigeria namely Delta, Edo, Bayelsa, Rivers, Cross River and Akwa-Ibom. They have different levels of tertiary institutions. FRN (2013) stated that tertiary institutions are all levels of education above secondary which are Monotechnics, Polytechnics, Colleges of Education and

Universities meant to train and produce graduates that are professionals and competent in their field of study. CAI inculcates knowledge and practical skills in the student to function competently in the field.
The development of ICT has evolved great changes in teaching and learning in tertiary institutions. The observed poor attitude, skills, knowledge and performance of students in clothing and textiles could be linked to ineffective teaching methods and instructional delivery that worsen students' interest in learning pattern making. Students have phobia for pattern making because of the conventional teaching/learning approach (lecture and demonstration), which has been criticized by scholars. This method is obsolete, does not stimulate students to brainstorm for initiative, creativeness and contribution in learning process. It is imperative for an exciting new ways and innovative methods of learning pattern making, to enhance the interests of the students in institution. On this background, the study examined computer aided instruction (CAI) needs for clothing and textiles students in Nigeria's tertiary institutions. This would equip students with competencies to go into mass production of patterns of different styles and sizes for sustainable industrial development.

Purpose of the Study

- ascertained the extent of lecturer's awareness of Computer aided instruction for pattern making in clothing and textile for students in Nigeria's tertiary institution;
- identified the instructional resources needed for pattern making of clothing and textile students in Nigeria's tertiary institution;
- determine Computer-aided instruction (CAI) needs for pattern making of clothing and textile students in Nigeria's tertiary institution;

Research Questions

- To what extent are lecturers aware of Computer aided instruction for pattern making in clothing and textile for students in Nigeria's tertiary institution?
- What are the instructional resources needed for pattern making of clothing and textile students in Nigeria's tertiary institution?
- What are the Computer aided instruction needs for pattern making of clothing and textile students in Nigeria's tertiary institution?

Hypothesis

- There is no significant difference in the Computer aided instruction needs for pattern making of clothing and textile students in Universities, Polytechnics and Colleges of Education in Nigeria.

Research Methods

The method adopted in the study was descriptive survey. The study area was south-south Nigeria. The south-south states are Delta, Edo, Bayelsa, Rivers, Akwa-Ibom and Cross River. The population at the time of study was 233 subjects, consisting 17 lecturers and 216 students in clothing and textile education in the south-south tertiary institutions. Random sampling technique was used to select 3 Universities, 2 Polytechnics and 3 Colleges of Education. All the 7 lecturers and 68 students in the selected institutions were all used for the study.

The data was collected with the use of questionnaire, structured from the specific purposes. The questionnaire has four point rating scale of highly aware, moderately aware, lowly aware and not aware for research question one. Highly needed, moderately needed, least needed and not needed for research question

two and three, all were rated 4,3,2,1 respectively. The items of questionnaire were face validated by three clothing and textile lecturers in University of Nigeria, Nsukka, Enugu State. Questionnaire was administered to 20 subjects not included in the study. Cronbach alpha coefficient of 0.78 was obtained after computation for the reliability. The instrument was administered to the 7 lecturers and 68 clothing and textile students by the researcher and the research assistants, all filled and returned.

The research questions were analysed with the use of mean and standard deviation. Mean of 2.50 was used as cut off point. All items with mean of 2.50 – 4.00 were considered as Highly aware/ Highly needed, 2.00 – 2.49 were considered as moderately aware/ moderately needed and 1.00 – 1.49 were considered as Not aware/Not needed. Analysis of variance (ANOVA) was used for the hypothesis at 0.05 level of significance.

Results

Research Question One: To what extent are lecturers aware of Computer aided instruction for pattern making in clothing and textile for students in Nigeria's tertiary institutions?

Table 1: Mean score of responses on extent of lecturers' awareness of Computer Aided Instruction for pattern making in clothing and textile.

S/No	Extent of lecturers awareness of CAI in pattern making	$\underline{x}$	SD	Decision
1	I am aware CAI can be used in pattern making	3.01	0.84	HA
2	I have knowledge of the use of CAI in pattern making	1.04	1.72	NA
3	I have used CAI in pattern making teaching and learning in the class.	1.10	1.62	NA
4	I know CAI can be used in teaching theory in pattern making	2.47	0.82	MA
5	I am aware CAI can be used in teaching practical in pattern making	2.49	0.72	MA
6	I am aware CAI can make pattern making more interesting and effective	3.28	0.81	HA
7	I am aware CAI can increase students participation in pattern making	3.52	0.81	HA
8	I am aware CAI can make pattern making student centered than teacher centered	3.48	0.69	HA
9	I am aware CAI can be used for large group of students	3.08	0.77	HA

Key:$\underline{x}$ Mean, SD = Standard Deviation, HA-Highly aware, MA = Moderately Aware and NA = Not aware

Result in table one showed that items, 1,6,7,8 have mean ranging from 3.01-3.52 which means Highly aware, item 4 and 5 have mean between 2.47-2.49 meaning moderately aware and items 2 and 3, have mean range of 1.04 – 1.10 which means Not aware. Indication is that the lecturers are highly aware that CAI can be used in pattern making, makes it more interesting, effective, increase students participation, making it student centered than teacher centered. Also can be used for practical and theory but they have never used it.

Research Question Two: What are the instructional resources needed for pattern making of clothing and textile students in Nigeria tertiary institutions?

Table 2: Mean score of responses of instructional resources needed in pattern making of clothing and textile students.

S/NO	Instructional Resources needed in pattern making	$\underline{x}$	SD	Decision
1	Internet	3.82	0.82	HN
2	Email	3.68	0.76	HN
3	Facebook	3.00	0.91	HN
4	Skype	3.01	0.80	HN
5	Twitter	3.20	0.62	HN
6	Instagram	3.25	0.68	HN
7	Blog	3.00	0.71	HN

8	CD-Roms	3.18	0.78	HN
9	Pattern making software	4.00	0.67	HN
10	Computer	3.89	0.81	HN
11	Projector	3.90	0.90	HN
12	Television	3.86	0.67	HN
13	Digital Scanner	3.88	0.80	HN
14	Pattern Plotter	4.00	0.72	HN
15	Colour video	3.89	0.68	HN
16	Colour printer	3.91	0.82	HN
17	Pattern spreader and labeling machine	4.00	0.65	HN
18	Pattern cutting machine	4.00	0.69	HN
19	Pattern printer	4.00	0.98	HN
20	Photographic camera	3.85	0.90	HN
21	Digitizer	3.92	0.80	HN

Key: :$\underline{x}$mean, SD Standard deviation, HN = Highly needed.

Result in table two showed that all items have mean ranged from 3.00 – 4.00 which means all the items are highly needed. Indicating that the instructional resources needed are internet, email, Facebook, computer, pattern making software, pattern plotter, pattern printer and pattern labeling and cutting machines, among others. The standard deviation ranged from 0.62 – 0.98 showing closeness in responses of the respondents.

Research question Three: What are the Computer aided instruction needs for pattern making of clothing and textile students in Nigeria tertiary institutions?

Table 3: Mean scores of responses on CAI needs in pattern making of clothing and textile students.

S/NO	Area of CAI needs in pattern making	$\underline{x}$	SD	Decision
1	Taking accurate body measurements	3.82	0.84	HN
2	Feeding the measurement into the computer	3.62	0.69	HN
3	Operating the computer to plot pattern pieces	4.00	0.72	HN
4	Processing and transmitting measurements into pattern pieces	4.00	0.80	HN
5	Checking the drafted patterns pieces for pattern making instructions	3.84	0.79	HN
6	Arranging the pattern pieces to avoid cut off	3.18	0.67	HN
7	Printing out pattern pieces with the right paper	3.51	0.82	HN
8	Arranging pattern pieces properly	3.30		HN
9	Storing pattern pieces in envelope	3.85	0.89	HN
10	Cross check the quarter scale to understand pattern pieces for the style	4.00	0.78	HN

Key: :$\underline{x}$mean, SD Standard deviation, HN = Highly needed.

Result in table three showed all the items ranged from 3.18 – 4.00 which is above 2.50 mean cut off, that means all the items are highly needed. This indicated that CAI are needed in taking accurate taking body measurements, feeding the body measurements into computer, operating and processing into pattern pieces, printing out, arranging, cross checking, storing pattern pieces, among others, for pattern making innovation in clothing and textile education.

Hypothesis: There is no significant difference in the Computer aided instruction needs for pattern making in clothing of textile students in Universities, Polytechnics and Colleges of Education, in Nigeria.

Table 4: One way are ANOVA on CAI needs for pattern making innovations in Universities, Polytechnics and Colleges of Education, in Nigeria.

Source	Sum of square (ss)	df	Mean square (ms)	F=cal	Sign	Decision
Between groups	2.20	2	1.10	2.61	0.678	NS
Within groups	40.62	73	0.42			
Total	42.82					

Key: d.f = degree of freedom

Result of table 4 showed F-value 2.61 is not significant at the equivalent significant value P>.0.05 (accepted). Indication is there is no significant difference in the CAI needs for pattern making innovation in Colleges of Education, Polytechnics and Universities.

Discussion

Findings of the study showed that lecturers are highly aware of the use of CAI in pattern making for innovations in clothing and textile, it makes teaching and learning more interesting, effective, increase students' participation and not teacher centered; used for large theory and practical, classes, but they have never used it in instruction. This confirms the study of Oshima &Muramatu (2015) report that ICT promotes large classroom teaching and learning, as well as individualized learning directed towards learners; abilities. Computer and internet used for instruction give room for new pedagogical practices in instruction. Findings further support Diogo, Silva & Viana (2018), Micheal (2011) who stressed that pedagogical innovation and changes in teaching and learning processes in the school system usually result in significant reforms that make education more meaningful. It is of note that the use of CAI in teaching pattern making shifts teaching and learning practical from conventional teacher led to students' instruction and participation. This makes pattern making class more interesting and students' participatory for greater learning attainment.

Findings also showed that all the instructional resources are highly needed for CAI in pattern making. These include; computer, internet, Facebook, email, twitter, pattern making, software, plotter, printer, labeling and cutting machines, among others. In line with the finding of Jinajai and Rattanavich (2015) who found that CAI utilized computer, internet (online program) for interactive teaching and allows students get immediate feedback on assignment and activities done. Azonuche (2015) pointed the use of computer in teaching and learning as enhancing teachers' pedagogical methods in many ways, such as students learning individually at their own pace and solving problems. Ejinkonye (2015) reported the use of ICT tools and equipment such as computer, internet, skype, software, DVD player, recorder, power point projector, among others, are utilized to improve instructional activities in institutions" (Aza &Modebelu, 2013; Azonuche, 2015). Supporting Cingi (2003) reiterated making teaching and learning processes more effective and easier when the required knowledge and information are transmitted at the same time through various sources as words, pictures and sounds provided by the ICT tools and equipment used in learning. This method of knowledge transmission motivates the learners' interest and participation. Oluwaleyimu and Nwabah (2017) pointed that computer assisted instructional technique is a useful teaching method in garment making education that utilizes graphics, text, video and sound to improve pedagogical processes in the classroom areas of the school curriculum (Azonuche, 2021).

Findings further showed that CAI is needed in taking accurate body measurement, feeding and keying the body measurements into the computer, operating, processing into pattern pieces and printing out, among others, for pattern making in Nigeria's tertiary institutions. Findings agree with Igbo and Iloeje (2012) who explained Computer Aided Design as "one method of pattern making using computer, where the body measurements obtained are utilized, while following instructions provided in pattern drafting". This makes pattern making for clothing design ideas and garment features easy, accurate to specification, size and styles. (Azonuche et al, 2022). Anerua and Azonuche(2010); Oluwaleyimu and Nwabah (2017) identified computer assisted instructional as modern method that combines various technology that are added to the conventional teaching /learning in the classroom to attain higher skills and mastering of learning (Azonuche,

2015; Cyril, 2016). Oluwaleyemu and Nwabah (2017) further reported in their study that students performed better when taught with CAI in garment making than when taught with the conventional method. Therefore, this goes to buttress high need in the use of Computer aided instruction in teaching pattern making of clothing and textile students in Nigeria's tertiary institutions. This will provide opportunity for students who have phobia for pattern drafting in clothing and textile education to be motivated, develop interest, and acquire competencies and skills for empowerment, development, sustainability and alleviation of poverty (Azonuche 2020; Azonuche&Umeri, 2012). Furthermore Arubayi (2009) pointed out the relevance of standard, type and method of instructions in higher institutions on individual student's economic empowerment and development. Computer aided instruction needs in pattern making among tertiary institutions did not significantly differ. This is because clothing and textiles as a vocational subject for skill development is paramount in achieving sustainable national development. The use of CAI in pattern making as an innovation in tertiary institutions will in no small measure increase students participation and entrepreneurial skill development in garment design and manufacture for greater industrial development of the nation

Conclusion

The need for the use of CAI as an innovation in pattern making engineering in tertiary institution level of education have great impact on students interest in garment making process for competency, development, empowerment and sustainable development. It gives students opportunity to explore knowledge and skills in pattern making that will increase mass production to meet demands of garment industries. It is important that clothing and textile lecturers and students should not only be aware of the value of CAI in teaching and learning processes but integrate its use for individualized and collaborative learning in tertiary institutions.

Recommendations

- To develop competencies in pattern making the use of CAI should be adopted in by lectures and students in tertiary institutions for instruction delivery.
- The instructional resources needed such as computer, projector, DVD and pattern making software, among others, should be made available by the government and stakeholders in education to improve and standardize institutions.
- Lecturers should be trained on the use of modern teaching technologies to be able to function effectively in the use of CAI in pattern making
- Workshops, seminars and conferences should be carried out periodically to provide lecturers and curriculum planners with current trends in the area of technology use in curriculum planning and execution.

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