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THE NEW DEVELOPMENT OF CAD IN CLOTHING

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Abstract:- Modern CAD/CAM (Computer Aided Design & Computer Aided Manufacture) software provides faster and more efficient working systems through increased precision, productivity and organized information flow. Garment designing systems eliminate the tedious work involved in manual pattern drafting and grading, creation of layouts and relocation of written information. The computerization of different processes in the fashion industry is necessary to reduce the costs of a product and increase competitiveness. Computerized designing systems employ the use of software specifically designed for the development of industry specific objects, input/output of graphics, scanners and other remote devices. CAD is becoming popular due to its simplicity and accuracy in drawing opines. With CAD, the designs can be produced at a faster rate with more accuracy in drawings. Moreover, special drafting techniques can be employed and the design calculations are quick and superior. The introduction of CAD/CAM technology in the textile and fashion industry in the early 1980s resulted to improved efficiency of the design process due to automation of routine design tasks, increased productivity and shortened lead time in the product development process. This has led to the production of cheaper and better garments. However, successful use of CAD/CAM technology involves providing the right technology to suit the needs of the industry, to avoid inadequate or irrelevant training, or harmful attitudes among students towards these technologies. Some researchers argue that CAD/CAM technology requires a different kind of expertise than is needed for manual design. Thus, weaknesses of management skills in the use of technology seem to be a major barrier to a successful implementation of CAD/CAM. This includes the inability to estimate the learning needs of students in the current market. This is because considerable investments in training are required for effective CAD/CAM implementation. Clearly in today's global market, manufacturers must rely on new technologies to capitalize on current market trends. Thus, many institutions in the country have turned to educate their students on CAD/CAM systems to help develop and produce complex parts quickly and efficiently needed in the external market. In Kenya, this is true of Maseno University, University of Nairobi and University of Eldoret.First sewing machine was invented in the Victorian era, after the development of machine elite class use to have a seamstress who stitched the clothes for them on sewing machine. Before sewing machines everything was done by hand. The seamstresses went to the home of the woman who wanted to stitch the clothes. As industrial revolution started in the 19th century, garment industry too began to evolve but it was in its infancy and had no developed system for garment manufacturing. Seamstresses observed that they can develop standard patterns which can fit more than one woman. They developed a mathematical sizing system to accommodate most women with very few patterns. As businessmen, interested in lowering costs, they continued developing these patterns to become paper "information systems" engineered to control quantities of exact reproductions in cutting and stitching clothing in mass production systems.

Keywords: Digital clothing, Artificial intelligence, visible technology

XX. INTRODUCTION

The apparel industry grew from these tailors/businessmen, as they built manufacturing factories for production, which pattern engineering accommodated. Pattern engineering grew a great industry in the early and mid-20th century. Pattern making was first taught to "apprentices" who were called "designers".

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Creative designers of styles didn't exist in the early 20th century. Paris was center of the developments in style and creation in garments at that time and many other countries copied from there. Later designers created booklets for teaching the pattern making systems mathematically – that came to be called "pattern drafting". One dis-advantage of mass production was that designers put little effort in bringing new designs and patterns but they either copied or else made very little changes. Even today the readymade garment industry does not bring too many new ideas in the products rather it is creating mass garments to reduce cost. Garment industry has developed many new and time saving techniques, processes and machinery for the effective production today. The most important is the CAD/CAM which enables the designer, pattern maker, marker and grader to do their jobs precisely and effectively. In the garment manufacturing the first step is designing the sketch for the dresses that have to be prepared. For this purpose the designer first draw several rough sketches in the sketch book. The designer does not go for details at this moment but he rather let his creativity flow on the paper and he draws many sketches. Later these sketches are analysed by a panel of designers. They finally select few out of them. These few sketches are rendered in detail separately or in the form of a single collection. The designer also draws working drawings along with the sketch. Working drawings are flat drawing of the sketch and it help maker in understanding the patterns involved in the construction.

XXI. EXISTING SYSTEM

Fashion designing is a field which is making waves now-a-days. Clothing construction and designing is on the other hand another broad business which encompasses many distinctive areas. As with other fields of life fashion designing too has been influenced a lot from the advances in computer technology. Today most of the big guns in the fashion and clothing business depend on the use of computerized technologies in performing regular and unique tasks. The manual methods of designing and clothing construction have been taken by digital technologies. These technologies have made the tasks easier, faster, cheaper (in some areas), better and reliable. With the passage of time its demand is increasing and ten years from now computer aided systems will be the only possible way to do tasks. Companies who will not be equipped with such technologies will be unable to survive.In spite of great demand of computer technology in fashion and clothing areas, a very limited literature is found on it. Basically clothing and fashion industry utilizes CAD/CAM technologies. CAD is short for Computer Aided Designing and CAM for Computer Aided Manufacturing. These two technologies have revolutionalized the fashion business.

XXII. PROPOSED SYSTEM

The idea or concept generation is usually the first step in fashion designing. The idea can come from anywhere. A smart idea may lead to smart product; therefore the designer may usually give much more time to this step in order to bring positive results. Sometime the idea may come within an hour or two otherwise it may take days and weeks to think before act. In general a designer can get from computer by taking inspiration from large database that is available on internet. Images, videos, text and other sources on internet can help a designer in generating ideas, taking inspiration and designing better collections. Previously designers took inspirations from books, travelling, places and people etc. today all of these things are available on internet and the designer does not need to go places to take decision about the idea behind each collection.

A] Problem Statement

CAD/CAM is one of the technologies being used in the fashion industry for mass customization and production, making work easier through efficient and better quality of products. This need has created training opportunities for aspiring professionals in fashion design. To explore whether the training offered by various institutions to fashion design students is adequate, this study examines the importance of CAD/CAM knowledge to fashion design students in Kenya and whether it is conflicting with the training offered to graphic design students.

B] Specific Objectives

1. To determine CAD/CAM training courses offered to fashion design students in Kenya.

2. To determine the importance of CAD/CAM in fashion design industry.

3. To investigate the implications of graphic design software to the fashion industry To establish the relationship between the CAD/CAM training and its application to fashion design by students.

C] Theoretical Framework

This study applies a theoretical framework derived from the systems theory. Systems theory was advanced in the 1940s by Ludwig Von Bertalanffy. The system approach theory integrates the system into parts; it simply checks on each part of the system and how it contributes to the whole function of the system to perform at optimum level. The relation between the systems will help to understand the whole function of the system. This can be applied such that the different packages being used in the course to educate can adequately equip and enrich the students with the skills in CAD/CAM for fashion design as well as graphic design. This will help to integrate the way the various packages being taught and how they contribute to the whole system of fashion and design even through some of the software's are usually not for fashion and design students area of specialization. Figure 1 is a diagrammatic representation of the various factors that contribute to the understanding of CAD/CAM programs with their functions.

IV. MATERIALS AND METHODS

A] Study Area and Sample Selection

This study used a descriptive survey research design. The study was designed to depict the participants in an accurate way which is simply about describing people who take part in the study. The University of Eldoret is located approximately ten kilometers from Eldoret town and this is where the study was carried out. The university has several courses it offers but the study limited itself to the courses that have modules or parts that have CAD/CAM in their curriculum of study. This is referred to as purposive sampling since the sample was selected specifically due to the course structure that they do hence purposively done. 2.2 Data Collection and Analysis The required data was collected during the second semester period in the University of Eldoret during the first two weeks after the school reopens that is during January. A structured questionnaire was issued to obtain data from the respondents who gave their responses to questions in the study. The questionnaire was structured in a way that it had both open ended and closed question where the respondent only had to give a mark on the designated box to show response. Chi-Square analysis was done in order to establish the influence that CAD/CAM training has on the skills and perceptions of fashion and design students towards embracing technology in fashion and design industry. III. Results And Discussion 3.1 Respondent's Awareness of CAD/CAM Existence The study revealed that 87.5% of the respondents were aware of the existence of Computer Aided Design/Manufacture (CAD/CAM) packages while 12.5% were not familiar with these packages. Further, 37.5% of the respondents that were familiar with CAD/ CAM packages, said they were familiar with Archi CAD, AutoCAD and CAXA packages. This was influenced by the fact that these are commonly used packages by students taking Education Technology, Architecture, Interior design of Graphics courses. Also, 31.25% of the students reported that Graphic design packages like Photoshop, Corel Draw and Adobe Illustrator as the Main CAD/CAM packages are the ones they commonly used.

This can be attributed to the influence and interest of Graphic Design making students to look for these softwares and get to know how they work even before they are taught in class. There are also several clubs in the University that offer similar packages thus making more students to be aware of the Graphic Design packages. 25% of the students recorded to have actually known Fashion CAD packages such as Lectra, Tuka CAD and AssystBullmer. These are packages that the Fashion Design Students are actually taught in class but with minimal experience and practise, only few of them were able to remember them as compared to other Graphic packages that they interact with very often. Figure 2 shows the graphical representation of the findings on this matter.

V. IMPORTANCE OF CAD/CAMIN THE FASHION AND DESIGN INDUSTRY

CAD/CAM has been proven to be used in the international institutions such as University of Hong Kong, University of Johannesburg and Insituto De Moda in Italy. This actually means that the softwares are actually important in the Fashion Design Industry, since top fashion schools internationally are embracing technology in their studies, these eases the procedures of mass production and accuracy which are very critical in fashion design. CAD/CAM is used in various institutions and technology is advancing thus making it viable in the industry. Eighty-eight percent (88%) of the students agreed that CAD/CADM was important thus there is need for them to understand how to use these softwares (Figure 3). Thirteen percent (13%) of the respondents reported that CAD/CAM had no importance to the fashion industry.

When production starts the designer or the producer of the garments visualizes in mind the final product, how it will look and if there are any flaws in the sketches he can modify them. Not all designers have good vision and therefore most of them cannot foresee the end-product and the final product may prove a ruin.

VI. EFFECTS OF PRACTICAL SKILLS

on the Ease of Use of CAD/CAM As with all skills, practice makes perfect. From the study, 25% of the respondents agreed that exposure to CAD/CAM packages enhances one's capability and capacity in designing as well as interaction with clients. This is evident with features such as Quick Response (QR) which helps designers to respond fast to clients' needs thus enhancing productivity. However, 9% of the students responded that CAD/CAM had no influence on their practical skills while that it had actually had an effect, top schools international such as Intituto De Moda in Italy, National Polytechnic in Korea do use CAD/CAM in the study and thus students are highly accurate since human error is lowered due to use of computers. This therefore shows that the students need hands-on exposure to understand the effects that CAD/CAM has on their area of specialization.

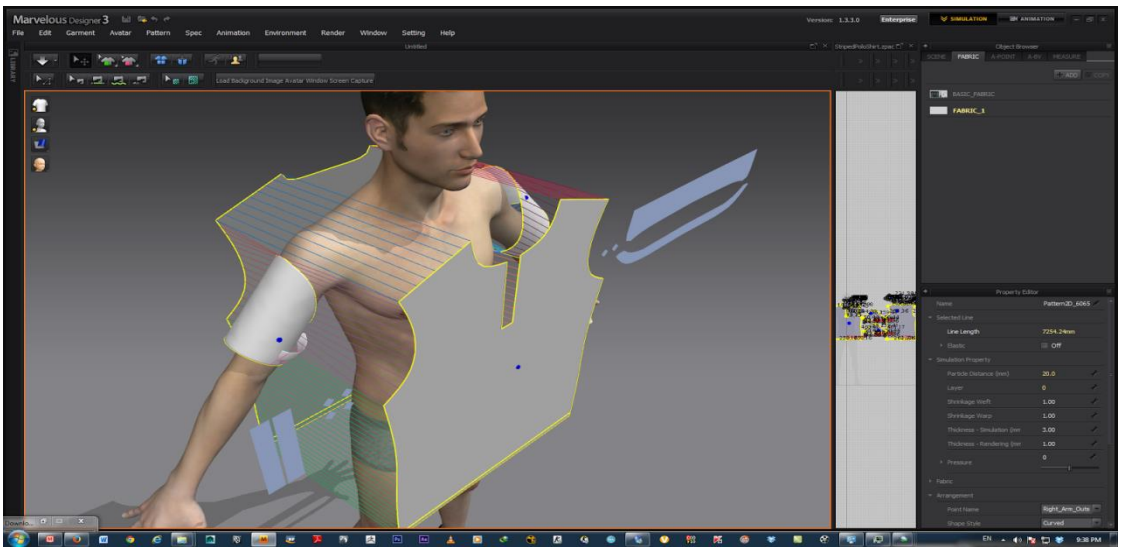
A] Theory and Practical Coverage of CAD/CAM Content

Further, 59% of the students reported that most CAD/CAM courses were mostly taught theoretically than practically. Therefore the students were not well equipped with the skills needed for the industry and job market, lowering their acceptance of the change in technology when in the job market. Most of the students observed that they are actually taught more of theory than practical lessons. This actually lowers the

interaction between the students and the packages. This in turn affected the frequency at which they can recall on how to practise what they have learned in class.

B] Influence of CAD/CAM Packages Taught to Apparel Fashion & Design Students Professionally

Chi-square analysis showed that the CAD/CAM curriculum taught to fashion design students had no influence on the CAD/CAM they used during their internships and therefore later in their prospective jobs ($p > 0.05$). This could be attributed to the fact that very few students actually had experience with the relevant CAD/ CAM packages and for the few who had the experience most of them probably had the experience during their field attachment and not in the class course. Most of the students noted that CAD/CAM is actually important to the Fashion and Design indutry. This may be due to experience and observation made during academic trips and internship as well as industrial field attachment where students saw the various programs in use.



CAD/CAM System for Design to Fabric Direct CadVantage Win Jacquard Direct of Teckmen Systems is basically a hardware- software system that uses tradition with a touch of technology for making Design to Fabric Direct . The salient features of this system are: No point paper designing, no card punching, no punching machine is required which means faster design changes plus cheaper design cost, Can be designed for any kind of jacquard either coarse pitch or fine pitch from 120 hooks to 1200 hooks, One single Jacquard Direct Controller can work for a maximum of 32000 hooks, Only driver cards have to be incremented depending on hooks used. Each driver card can control 128 hooks, One IBM PC can control more than 6 Jacquard Direct Controllers from central control station with remote administration, All the designs can be kept at the Control Station archive and free from tampering. Last minute changes can be made to designs sitting at the Control Room, All designs from the Design Station can be downloaded to the Controller Station via network so that no data loss or media corruption problem arises.

At various stages of fashion design, CAD has come to play a pivotal role. Starting from the initial design and prototyping stages, where the firm narrows in to a retailable and feasible design, the array of choices displayed visually facilitate the job significantly. Proceeding to the manufacturing stage, mass production that has always posed a challenge to industries has been simplified to a considerable extent by the automation provided by CAM. Perfect fabrication to measurements is a natural outcome. Even retailing via advertising to prospective clients has become a lot easier. Viewing 3-D images is always a handy tool for customers and manufacturers. Most packages are ready-to-use, and no special technical training is essential. This enables people on the shop floor to adapt to automated packages such as these.

VII. FUTURE TRENDS

Like all manufacturing and design areas, the textile industry too has profited a great deal from CAD/CAM. Better efficiency in colour selections and, more importantly, memory storage for future use are great

benefits. It is quite beyond any doubt that in times to come, several other path-breaking modifications like better target matching and reduced timeframes would be achieved by computerized packages.

Technology has only grown over the ages and has sucked in diverse fields into its fold. Textiles and fashion are no exceptions, and there are lots of promises still in store.

VIII. CONCLUSION

Introduction of CAD/CAM solutions through adoption of modern designs and colour combinations is making the textile fabrics more attractive and competitive to meet the rapid changing mood of the consumers for fashionable designs both nationally as also internationally. In handloom industry, this in tern, results in value addition of the produce thereby leading to overall enhancement of income and social empowerment of the handloom weavers community, and enables them to withstand competition effectively in domestic and international market. The CAD/CAM system through its ease, efficiency and economy of reproduction has been revolutionising the textile industry (both handloom and powerloom), and the textile designing in particular. This cutting- edge tool rather technology (in software and/or hardware) has been acclaimed all over the world as The No Limit solution for textile designing and manufacturing. No one can just imagine without it in this IT- driven era of global competitiveness. With numerous inputs and feedback from Experts, professional Designers, Manufacturers, Exporters, and Actual Users, these CAD/CAM systems are now the Ultimate Solution for Textile Industry and Trade as a whole..

1Lack of practical experiences in CAD/CAM during the lesson does not fortify the theory learnt.

2.Availability of CAD/CAM packages facilities ease the communication between clients and designers

3. Practice & Exposure to CAD/CAM packages in the work environment increases competence of the designers' skills and efficiency.

4. Students need to be exposed to both the practical and theory content in order for them to be competitive in the fashion industry.

IX. RECOMMENDATIONS

1Based on the findings of the study, the following recommendations are made:

2Institutions offering fashion design programmes should equip their laboratories with computer hardware and relevant software facilities to equip the students with CAD/CAM practical skills in order to make them competent.

3Hiring of at least one lecturer and technician that are competent in the field of CAD/CAM in fashion and design

4Have two field attachment sessions during the programme for students to get more exposure during their industrial attachment.

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