

CAD/CAM Training for Fashion Design

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ABSTRACT

Many tertiary schools and institutions of higher studying in India offer Computer Aided layout and laptop Aided Manufacture (CAD/CAM) in their education of favor design guides. This is because the utility of CAD/CAM technology is taken into consideration a primary step in handling dynamic modifications obvious in the fabric and fashion enterprise. The usage of CAD/CAM generation within the style industry enhances velocity and performance in garment production and designing thru extended precision, productivity and organized information float. This leads to shorter lead time within the product improvement process, as a consequence decreasing expenses of garments. But, studies carried out in public universities and fashion industries in India imply there's minimal adoption of CAD/CAM generation in schooling of fashion students. That is attributed to restricted suitable CAD/CAM hardware and software as coaching assets because of the excessive prices of these technology. This paper focuses on the significance of CAD/CAM technology used in style design training amongst tertiary colleges and institutions of higher mastering in India. This may assist produce ability manpower, in adopting potential systems to help cope with the fashion enterprise demands. records turned into acquired through document evaluation, questionnaires, interview and statement. The have a look at findings indicated that the training of CAD/CAM technology to the modern college students does now not appropriately meet the labour requirement within the garb industry. The paper hence recommends that institutions want to update the machine of teaching CAD/CAM so that it will input the sensible abilities wanted for the clothing industry.

Keywords : Computer Aided Design and Computer Aided Manufacture (CAD/CAM), Fashion Design, Higher Learning, Apparel Industry, Textile and Fashion, Lead Time

I. INTRODUCTION

1.1 Back Ground

Present day CAD/CAM (computer Aided design & pc Aided Manufacture) software offers quicker and greater green running systems thru expanded precision, productivity and prepared records go with the flow [1]. Garment designing systems remove the tedious work worried in guide pattern drafting and grading, introduction of layouts and relocation of written statistics. The computerization of different strategies in the fashion enterprise is vital to reduce the prices of a product and growth competitiveness. Automated designing structures appoint the use of software program mainly designed for the development of enterprise specific objects, input/output of pics, scanners and different far flung gadgets [1]. CAD is turning into popular because of

its simplicity and accuracy in drawing opines [2]. With CAD, the designs may be produced at a faster rate with more accuracy in drawings. Moreover, unique drafting strategies can be hired and the layout calculations are brief and superior [3].

The introduction of CAD/CAM technology inside the textile and style enterprise within the early Nineteen Eighties resulted to advanced efficiency of the layout process because of automation of routine design duties, expanded productivity and shortened lead time inside the product development procedure. This has led to the production of less expensive and better garments [4]. However, a hit use of CAD/CAM generation involves offering the proper generation to in shape the desires of the industry, to keep away from inadequate or inappropriate schooling, or harmful attitudes among students closer to those

technologies [5]. a few researchers argue that CAD/CAM technology requires a distinct kind of information than is needed for manual layout [6]. Consequently, weaknesses of control abilities within the use of era appear to be a first-rate barrier to a a success implementation of CAD/CAM. This consists of the inability to estimate the gaining knowledge of needs of college students within the current marketplace. This is due to the fact good sized investments in training are required for powerful CAD/CAM implementation [7]. Genuinely in brand new global marketplace, producers should depend on new technologies to capitalize on modern-day market developments. accordingly, many institutions in the usa have grew to become to teach their college students on CAD/CAM systems to help expand and convey complex parts fast and efficiently wanted inside the external market. In Kenya, that is proper of Maseno university, university of Nairobi and college of Eldoret.

1.2 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.

1.3 Specific Objectives

- ✓ To determine CAD/CAM training courses offered to fashion design students in Kenya.
- ✓ To determine the importance of CAD/CAM in fashion design industry.
- ✓ 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.

1.4 Theoretical Framework

This take a look at applies a theoretical framework derived from the systems principle. systems theory changed into superior in the 1940s by using Ludwig Von Bertalanffy. The device approach concept integrates the machine into components; it really checks on each part of the system and the way it contributes to the whole characteristic of the device to perform at most fulfilling level. The relation among the systems will assist to understand the whole characteristic of the machine. This can be applied such that the specific applications getting used inside the route to educate can accurately equip and enhance the students with the talents in CAD/CAM for style layout in addition to photo design.

This could assist to integrate the way the numerous programs being taught and the way they make a contribution to the entire system of style and design even thru a number of the software program's are commonly not for fashion and design students place of specialization. Discern 1 is a diagrammatic illustration of the various factors that contribute to the expertise of CAD/CAM programs with their features.

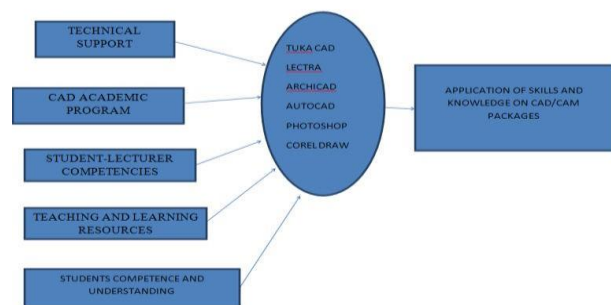


Figure 1 : Factors that Contribute to the Understanding of CAD/CAM Programs with their Functions Source: Heylighten[8]

II. Literature Review

Overview

In simple terms, when one is assisted with a computer in manipulation of pics and mathematical illustration of designs in the pc the use of a specific software and hardware, this is called computer Aided layout (CAD). Kazlacheva[9] states that CAD systems help in

designing, building and modelling of clothes quicker and with high accuracy. The style design industry could be very specific with its numerous drawing tools and equipment for modification in CAD systems. CAD includes the intersection of 3 units, geometric modelling, pc pics and design tools, based totally on their components [10]. Groover and Zimmers[11] examine that computer aided designing includes any type of designing interest which uses the laptop gadget to expand, analyze or modify any engineering designs.

Gould [12] observes that the cutting-edge style pc technology is used no longer handiest to layout fabrics and textile merchandise, however also create prototypes the use of a virtual design laboratory providing virtual textile printing, 3-d frame scanning and garment knitting; style layout studios with draping, CAD for 2nd and three-D layout. all these require know-how which a student can project into with relevant schooling.

famous CAD software to be had for style layout include VSticher, a 3D garment design and alertness software program from Browzwear dispensed inside the Asia-pacific vicinity by way of Pragma solutions, in India [13]. Lectra, style PLM, TUKA CAD and plenty of extra keep off the limits of product lifecycle control by way of covering all of the necessary steps for advent of collection and bringing collectively role-based packages for product-design, sample making and bodily and 3-d digital prototyping with equipment for the planning and control of series. Optitex specializes inside the development of innovative, easy-to-operate 3D CAD/CAD solutions for cut fabrics. It creates a virtual international when trying out manufacturing designs [14]. Gerber Accumark technology and Lectra are two of the most widely used CAD systems for fashion clothing, while Adobe Photoshop and Adobe Illustrator packages serve as fantastic virtual interpreters of the drawing abilities of a dressmaker [15]. Maya software software is broadly used for three-D modelling, animation and consequences. this is suitable for film and tv manufacturing, video games development, internet design and print production [16]. Assyst software is in good sized use in all aspects of the fashion enterprise international inclusive of children's put on, guys's wear, girls put on, couture, underwear and outerwear. Assyst software is used for creating designs in 2nd and 3D paperwork, frame dimension, sample cutting, style

improvement, grading, ratings and costing, marker making and cut order planning.

Benefits of Using CAD/CAM

Computer Aided design is a joining of human and system, working collectively to optimize design and manufacture of products [17]. Computer systems permit designers to graphically check thoughts in actual time while not having to create actual prototypes. This reduces engineering prices for an authentic system producer (OEM); is in which a company whose products are used as components in another business enterprise's product, in this example using CAD/CAM hardware generation substantially inside the fashion and design industry by using the designers is the use of products and services from different corporations with the purpose of enhancing merchandise inside the industry and additionally results in products attending to marketplace faster. Non-technical group members from control to advertising can paintings with engineers to view, discuss, change and file a layout in progress before constructing a prototype. That is an powerful characteristic of revolutionary designing that aids in identifying layout flaws and reinforces organization "brain storming", ensuing in fewer misinterpretations and better product waft [18].

CAD/CAM analytical equipment permit design upgrades through an cheaper and time-saving procedure. New integrated software equipment which are commercially available, have been evolved to permit layout engineers to carry out finite detail analysis immediately, for the duration of the early levels of layout, thereby ensuring that the excellent layout purpose is carried out [19]. This in flip reduces very last prototype numbers, lowers layout costs, and reduces time to marketplace [20]. Latest systems are lots more user pleasant and can utilize modern-day fashion in windows working machine computing. With operating structures consisting of home windows 7, 8, and 10, Mac and Android structures, CAD/CAM softwares perform efficiently with growth of the photo memory allocation within these systems for the reason that its advent to the marketplace.

CAD/CAM Training in Learning Institutions in Kenya

Some of the CAM/CAM technologies that fashion design students are expected to be knowledgeable in include 3D anthropometry systems, Lectra, Gerber and Tuka CAD. However, due to lack of facilities, students are only expected to conduct research on the latest CAD/CAM software for fashion and design. Thus students often rely on the internet to conduct their research therefore lacking in practical exposure to the software. This in turn enables the students to be only skilled in documentation and not the actual production of the technology.

This is in contrast with students pursuing other courses such as Education Technology, Engineering or Architecture. TVET report of 2011 states clearly that CAD/CAM used in higher education is mainly used for students in the fields of Engineering and Architecture. These students are exposed to the CAD/CAM software such as ARCHICAD, AUTOCAD and CAXA software that help in the designing processes as these are the most renowned CAD/CAM softwares used in the Education industry. This makes the students to gain practical and theory experiences.

III. METHODS AND MATERIAL

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 kilo metres 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.

Data Collection and Analysis

The required records was gathered for the duration of the second semester period within the university of Eldoret throughout the first weeks after the faculty reopens this is at some stage in January. A established questionnaire turned into issued to achieve data from the respondents who gave their responses to questions inside the have a look at. The questionnaire turned into established in a manner that it had each open ended and closed question in which the respondent handiest needed to supply a mark at the exact box to show reaction. Chi-rectangular analysis changed into carried out with a view to establish the have an effect on that CAD/CAM training has at the capabilities and perceptions of favor and layout students toward embracing generation in style and layout industry.

IV. RESULTS AND DISCUSSION

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 ArchiCAD, 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.

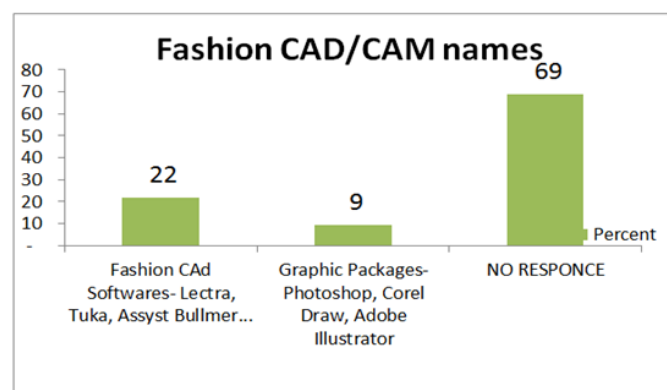


Figure 2: Known CAD/CAM applications known to response

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 Assyst Bullmer. 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.

Importance of CAD/CAM in 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.

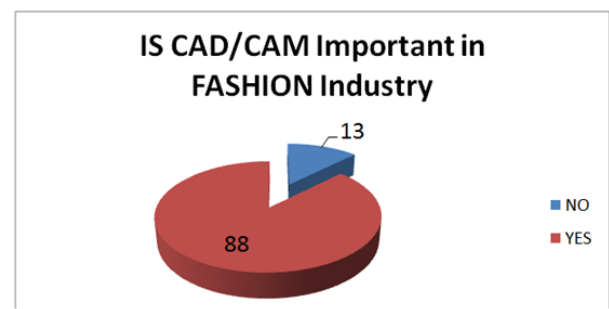


Figure 3: Respondents' Opinion on the Importance of CAD/CAM to Fashion and Design Companies

Many students had interacted with CAD/CAM in other places other than the university premises. Places of interaction with CAD/CAM software included industrial field attachment industries e.g. Bedi in Nakuru and places that the students have actually visited during their educational trips at the Export and Processing Zones in Ruaraka, Nairobi. This shows that CAD/CAM is actually being used in the fashion industry. This should motivate universities to invest in this technology so as to effectively train their students so that they can compete effectively in the job market.

Relationship between the Packages Taught and Application of the Knowledge Acquired by the Students

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.

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.

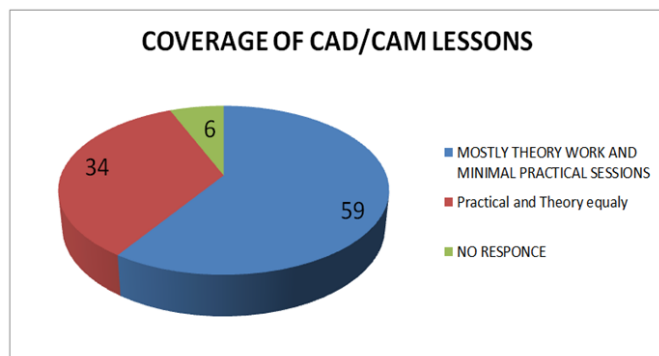


Figure 4 : Pie Chart on Computer Aided Design/Manufacturer Lessons Coverage

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.

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 industry.

V. CONCLUSION AND RECOMMENDATION

1. Lack 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.

Recommendations

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

1. Institutions 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.
2. Hiring of at least one lecturer and technician that are competent in the field of CAD/CAM in fashion and design
3. Have two field attachment sessions during the programmes for students to get more exposure during their industrial attachment.

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