

Research Article

Work-Integrated Education in Fashion Design

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Abstract

The Hong Kong Polytechnic University has adopted a Work-integrated Education (WIE) programme as a compulsory requirement for all full-time government funded undergraduates. WIE is a work-based, structured and measurable learning experience based in the industry where students will work upon graduation. This has proven to be an effective and crucial part of student learning, in particular for the applied arts and science areas. In this context, the Institute of Textiles and Clothing of the Hong Kong Polytechnic University encourages students to search for their job placement for WIE throughout their academic years on a non-credit bearing basis. However, not every enterprise is willing to take part in the WIE programme due to either a lack of resources or poor performance demonstrated by former student interns. The latter is more common in the fashion design sector where students' academic performance, which is largely based on theory, doesn't represent the professional skill sets including drawing (manual and computerised) and sewing techniques and this continues to be a weakness of the fashion design area in a research driven university setting. This can be rectified by proper professional training through well-structured on-line self-learning tools. This paper will share an online self-learning tool which has been developed by the author, and demonstrate how this tool helps fashion design students prepare for WIE.

Keywords: Work-integrated education, Fashion Design, Adobe Illustrator, On-line self-learning.

Introduction

The fashion industry is characterised as ever-changing [1], and fast developing technologies have further accelerated developments in the fashion world to offer products more quickly, less expensively, and in greater abundance than ever before [2]. Increasingly, the fashion industry relies on new technologies to design clothing styles, produce garments and develop marketing strategies and it is essential that fashion students are fully exposed to these technologies in order to maintain their competitiveness in this particular business arena [3]. Therefore, successful fashion design programmes need to be designed to equip students with these new technological skills so they are

capable of quickly adapting to a fast changing work environment and ensure they are ready to respond to the ever-changing demands of their chosen profession.

Providing an appropriate learning environment which facilitates effective and efficient skill acquisition in relation to these essential new technologies presents a considerable challenge for academic staff because traditional classroom instruction relies heavily on demonstration which is expensive in terms of instructor and student time. Furthermore, it is almost impossible for the instructor to provide individual hands-on advice to class sizes which often exceed 30 students. The need for active demonstration is not a new phenomenon in fashion education and is required by many subjects regardless of whether they have a technological component. For example, many subjects in fashion are already integrated with technologies or the subject itself is the technology such as Computer Aided Design (CAD) and computer aided manufacturing (CAM). However, many subjects such as fashion sketching, sewing techniques and manual patternmaking do not normally involve the use of technology and are traditionally taught in small group settings where students can observe live demonstrations provided by the instructor from close proximity.

The preferred mode of learning at The Polytechnic University of Hong Kong is outcomes based and whilst outcomes based teaching and learning is not a new idea [4], many academic colleagues are actively seeking ways to leverage information technology solutions to design constructively aligned online teaching and learning activities (TLA's) which add value to the student learning experience and significantly assist in the process of skill acquisition without adding considerably to delivery costs in terms of instructor and student time. In order to maximise the student learning, the Hong Kong Polytechnic University has adopted a Work-integrated Education (WIE) programme as a compulsory requirement for all full-time government funded undergraduates. WIE is a work-based, structured and measurable learning experience based in the industry where students will work upon graduation. This has proven to be an effective and crucial part of student learning, in particular for the applied arts and science areas. In this context, the Institute of Textiles and Clothing of the Hong Kong Polytechnic University encourages students to search for their job placement for WIE throughout their academic years on a non-credit bearing basis. However, not every enterprise is willing to take part in the WIE programme due to either a lack of resources or poor performance demonstrated by former student interns. The latter is more common in the fashion design sector where students' academic performance, which is largely based on theory, doesn't represent the professional skill sets including drawing (manual and computerised) and sewing techniques and this continues to be a weakness of the fashion design area in a research driven university setting. This can be rectified by proper professional training through well-structured on-line self-learning tools. This paper will share an online self-learning tool which has been developed by the author, and demonstrate how this tool helps fashion design students prepare for WIE.

Challenges

The course chosen for this exemplar case study is 'Creative Intimate Fashion Design' offered by The Institute of Textiles and Clothing at the Hong Kong Polytechnic University as a final (fourth) year compulsory subject. The course is designed to strengthen students' creative design skills by providing global insights into the process of intimate fashion design and is offered once each year as a compulsory component of an undergraduate degree programme. The course requires students to draw a minimum of 112 technical sketches (56 front view and 56 back view sketches of top and bottom intimate garments) in order to achieve the outcomes for the course. The use of Adobe

Illustrator is highly recommended because this is currently the computer graphics software most commonly used by fashion designers in the industry.

In common with many undergraduate courses involving the acquisition of skills which are essential components of functioning in the industry, a major challenge for both students and teachers is maximising both student and staff time and resources. Furthermore, from the 37 students enrolled on 'Creative Intimate Fashion Design' in 2007, only one student had previous experience of using Adobe Illustrator. In 2006, none of the students enrolled on the course had previous experience of using Adobe Illustrator. It is perhaps a surprising and disappointing fact that undergraduate fashion students in their final year of study for their degree are not generally equipped with these key skills despite the fact that this software is almost universally used in the fashion industry. Increasingly, technical sketches prepared with Adobe Illustrator represent the norm for the industry, a trend already driven by some more industry experienced students from around the World, so it is imperative and timely that Hong Kong Polytechnic University offers this learning opportunity for its students.

In the past, whilst the need was recognised, only one 3-hour class on 'How to use Adobe Illustrator' was offered each year at the beginning of the semester and this proved insufficient time for students to reach a reasonable basic standard of competence with the software. Consequently, an online self-accessed course component on how to use Adobe Illustrator for fashion design was designed to be embedded within the 'Creative Intimate Fashion Design' course as a solution which would both maximise student learning opportunities and minimise cost, particularly in terms of expensive staff time, whilst significantly contributing and adding value to the course intended learning outcomes. Online teaching and learning activities are a key element in all blended learning courses [5], and many of the better examples are presented visually as graphics, video or animations [6]. One of the major drawbacks when teaching a course on fashion design is that the graphical representations in a standard textbook are static so that the student normally has to follow a lengthy sequence of drawings in order to understand complicated processes such as fashion sketching or pattern drawing. Unfortunately, even when students have read and observed the text and the sequence of drawings, many still struggle to grasp the dynamic nature of these complex interactive processes. The authors therefore decided to focus on designing teaching and learning activities which maximize the benefits of an online learning environment, such as that provided by Web CT, in order to add significant value to the student learning experience whilst tackling the task of facilitating the acquisition of these particularly difficult skills and processes. In so doing, they were guided by Tufte [7] who identifies certain 'principles of graphical excellence', amongst which is the well-designed presentation of interesting information. Excellent visual information is classified as consisting of complex ideas communicated with clarity, precision, and efficiency. Consequently, the authors designed the visual online teaching and learning activities to present the greatest number of ideas in the shortest time and within a small space. They also ensured that these online activities were constructively aligned with key intended learning outcomes for the course and that they provided the opportunity for students to review and repeat the illustrated processes in order to improve skill acquisition.

Therefore, the design for the online self-accessed component of the course involves a series of short instructional videos which provide a step by step guide for students on how to create different types of garment using the Adobe Illustrator tools. The instructional videos are made available through

the University's online learning platform and on completion; students are assessed on their ability to create high quality technical sketches for both course work and final project purposes.

Technical Sketch and Exit Skills

The course teaches two basic types of drawings; one is for fashion illustration and the other is for technical sketching purposes. Technical sketches are required for details such as seams, stitches and trims and include front and back view designs whereas fashion illustrations can be created using more artistic expression with fewer or no details. It is the global norm for fashion schools to encourage students to use computer aided drawing tools, and technical sketching is generally emphasised as a 'must-have' exit skill for students who major in fashion design. Exit skills can be defined as those skills that students will take to the industry upon their graduation. Basic exit skills can be divided into five general areas and include:

- **Foundation skills:** Using Windows-based programmes.
- **Basic design skills:** Demonstrable understanding of the use of colours, aesthetics, proportion, and balance.
- **Basic research skills:** The ability to identify industry and consumer trends, and an understanding of fashion forecasting.
- **Design evolution:** Demonstrating the skills to create a line from the mood board stage through to the work board (eventual working design).
- **Board preparation and presentation:** Demonstrable ability to incorporate elements of design with marketing skills.

Technical sketching is therefore seen as an essential part of basic design skills, and it is also an area which has grown significantly in importance over the last decade as a result of the globalization of garment production. Technical sketches are now commonly used as communication tools between designers and patternmakers, production managers and sewers. The applications of technical sketches are now virtually unlimited, from work board sketches to specification sheet sketches, to costing sheet sketches, to catalogue sketches and consequently the industry invariably uses computers to draw new sketches and revise existing sketches in order to save time. Therefore, the ability to draw good computer-aided technical sketches is now a critical skill for graduates in order to create wearable clothing [8]. Figure 1 shows an example of the type of technical sketches commonly used in the industry.

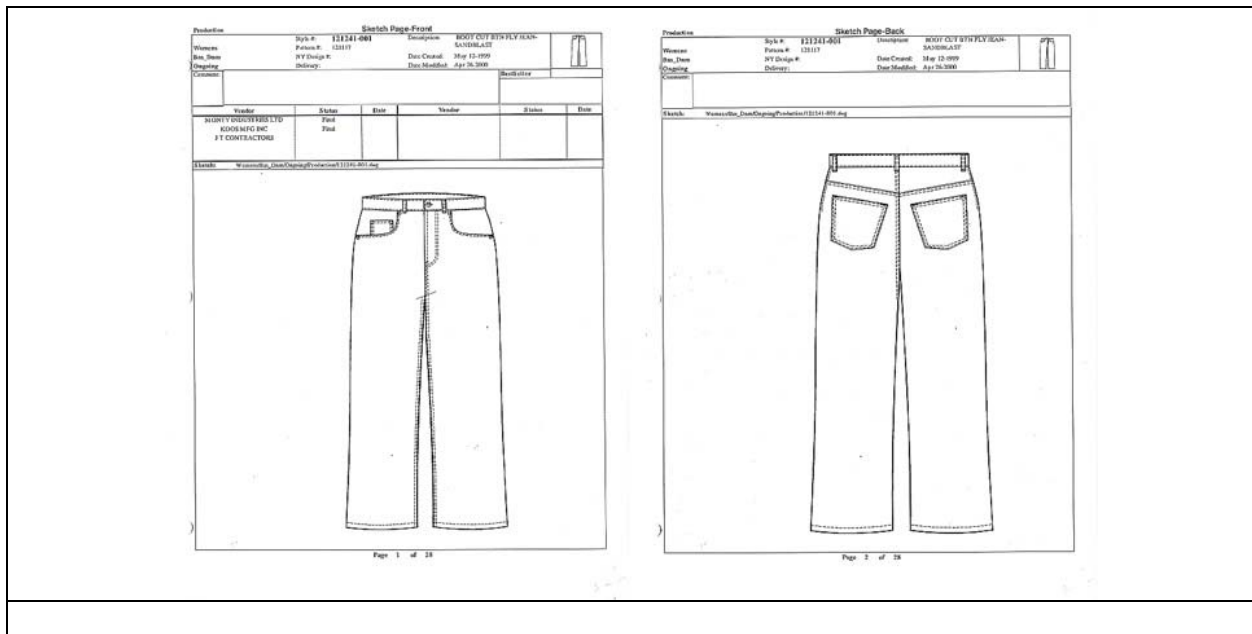


Figure 1. Example of technical sketch

(Source: Gap, 2000)

Computer Aided Design (CAD) in the Fashion Industry

The use of computer-aided design (CAD) emerged in the fashion industry during the 1970's as a pattern drafting, grading and marker making tool and immediately improved many aspects of the mass-production procedure, rendering processes both faster and easier. Consequently, some key research has been undertaken on the human aspects of using CAD [9, 10, 11, 12]. In particular, Hardaker and Fozzard [13] investigated new CAD practitioners' attitude in relation to training future professionals in the industry. The results of this study suggest that students show a very favourable attitude towards learning CAD. Ten years after the Hardaker and Fozzard [13] study, our students' attitude towards learning CAD is not only favourable but increasingly organic as most of our students are 'digital natives' [14] who expect and require innovative use of software to complement their learning experience.

Chase [2] categorises currently available CAD systems into 11 groups: textile design systems, illustration systems, texture mapping, embroidery systems, specification and costing systems, digitizing systems, grading systems, marker making systems, pattern design systems, robotics and garment-moving technology, and commercial software systems. Currently The Institute of Textiles and Clothing at Hong Kong Polytechnic University offers a variety of CAD systems developed by the Lectra and PAD systems and Gerber technology in order to provide industry preferred graduates to potential employers. A particular problem with all of these systems, is that they are too expensive for most small and medium size enterprises, and certainly too expensive for individual students.

CAD for Technical Sketches

Fashion designers in the industry generally use two types of graphics programmes, vector-based-drawing and raster-based-image programmes in order to create artwork [15]. Commonly used line drawing programmes are Adobe Illustrator, Corel Draw, Fractal Design Painter and Micrografx Designer. The most popular raster-based image programme is Adobe Photoshop. Despite this wide range of choices, Adobe Illustrator remains the most preferred line drawing programme amongst all computer graphic programmes in the industry. Consequently, Adobe programmes are now considered the industry leaders in terms of producing affordable good quality graphics.

Adobe Illustrator for Fashion Design

Adobe Illustrator is often used as a part of other systems because the Adobe programmes are so complete. For instance, ‘Snap Fashion Library’ which is marketed in USA and Europe was created in Adobe Illustrator and requires Adobe Illustrator for complete operation (<http://www.snapfashun.com/snapfashun.html>). Figure 2 provides an example of the use of Adobe Illustrator within this programme. A leading web based fashion forecasting company, WGSN, offers a series of highly-subscribed tutorials for fashion designers on how to use Adobe Illustrator effectively (<http://www.wgsn-edu.com/edu/edu-members/>).

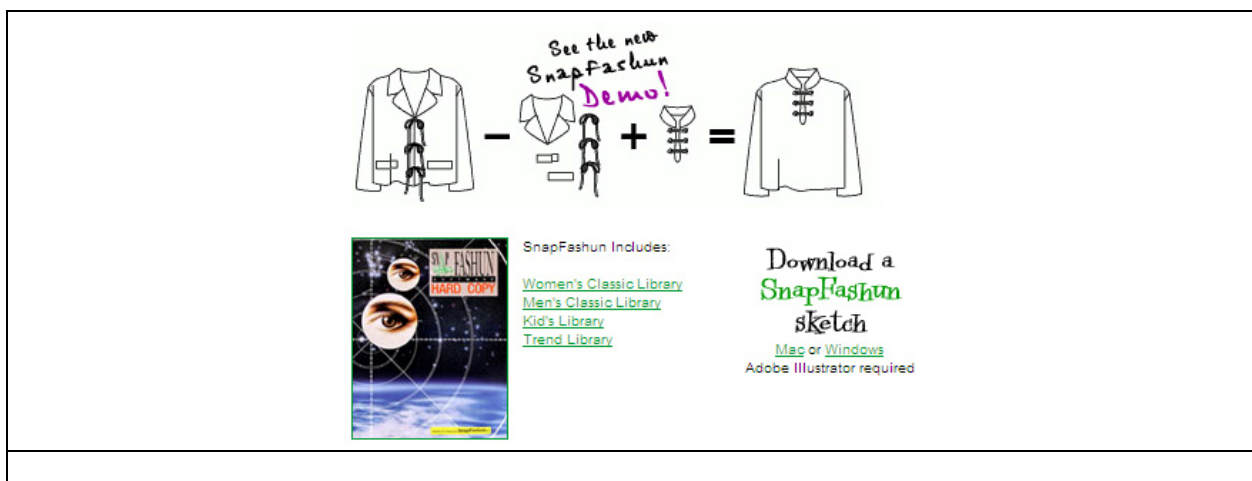


Figure 2. Use of Adobe Illustrator.

(Source: www.snapfashun.com, 2006)

The Hong Kong Polytechnic University Project ‘Adobe Illustrator for Fashion Designers’

The three-credit unit course ‘Creative Intimate Fashion Design’ was offered in the Spring semester of 2007 with the introduction of the new series of short online instructional videos providing a step by step guide for students on how to create different types of garment using the Adobe Illustrator tools. A range of techniques for creating technical sketches were covered and the course intended learning outcomes for the online teaching and learning activities were set as follows:

Upon completion of this online component of the course the student should be able to:

1. Create objects using Adobe Illustrator.
2. Fill objects with colours and patterns.
3. Manipulate objects to create designs, layouts and presentations.
4. Create custom colour palettes and custom patterns.

Students were given instructions on how to access the distance learning website and how to use the basic tools of Adobe Illustrator in the first week of their study.

The online component consisted of a series of short instructional videos so that students were able to view them anywhere and at anytime during a one week period and short assessment tasks were designed to encourage students to access and follow the online step by step guide to using the design software package and submit the assignment task immediately prior to the release of the next video session. The previous week's instructional video was then blocked to ensure students finished their work on time. In addition to the software skills acquired, students also developed individual problem solving skills through this experience because, as one student put it, there is no one available to ask in the middle of night so they have to view, review and practice until they acquire the required skill set.

The Hong Kong Polytechnic University project builds on previous work undertaken by the authors in the USA and enhances student learning through the provision of the informative and practical instructional videos which guide students step by step through the process of creating different types and styles of garment using the Adobe Illustrator software tools. These instructional videos are also released online using the University online learning platform and guide students throughout the whole design process to creating technical sketches for both course work and final project. Until the introduction of this online component, the growing use of this powerful software package in the fashion industry was not matched by appropriate and comprehensive training in the skills required at Polytechnic University, and this cost effective solution provided the perfect opportunity to improve student learning and the quality of graduate fashion skills in this area. Vygotsky's [16] view was that in order to subject a function to intellectual and voluntary control, we must first possess that function. In other words, metacognition and self-reflection will develop first as a skill before it can be used as a series of consciously controlled strategies. In other words, effective and creative use of the software in the fast moving fashion industry requires more than just skills. The series of instructional videos are also designed to assist with developing the ability of students to reflect on the creative design process (metacognition) and develop more generic capabilities [17], which can be transferred to other areas of professional practice.

Project Objectives

The following objectives were set for the project in order to ensure that the finished products (the instructional videos) were fit for purpose and could provide specific guidance to students on the creation of the well proportioned technical sketches expected of graduates by the industry:

- To provide customised Adobe Illustrator instruction.
- To facilitate learning to create well proportioned technical sketches using Adobe Illustrator.
- To create a learning platform which students can access anytime and anywhere.

- To provide unlimited opportunities for repeated explanation and skills practice.
- To provide an opportunity for students to develop self-regulation and self-management skills.
- To develop students' generic learning and metacognitive abilities.

A major advantage of this project is that students can now learn at their own pace, within reasonable timescales, through repeating the instructional videos anytime and anywhere, working reviewing the materials, exercises and examples..

The particular learning components of this project can be divided into four main areas:

1. Introduction to the tools & menus.
2. Use of different garment rendering techniques.
3. Methods to create new swatches and brushes.
4. Building a personal technical sketch library for future use.

Currently available Adobe Illustrator tutorials are woefully inadequate and not intended for fashion design with the few available tutorial books and CDs limited to industrial and graphic design use. The instructional videos used as part of this course allow students to access appropriate learning materials anytime and anywhere. Figure 3 shows an example of a screen image of from the instructional video clips.

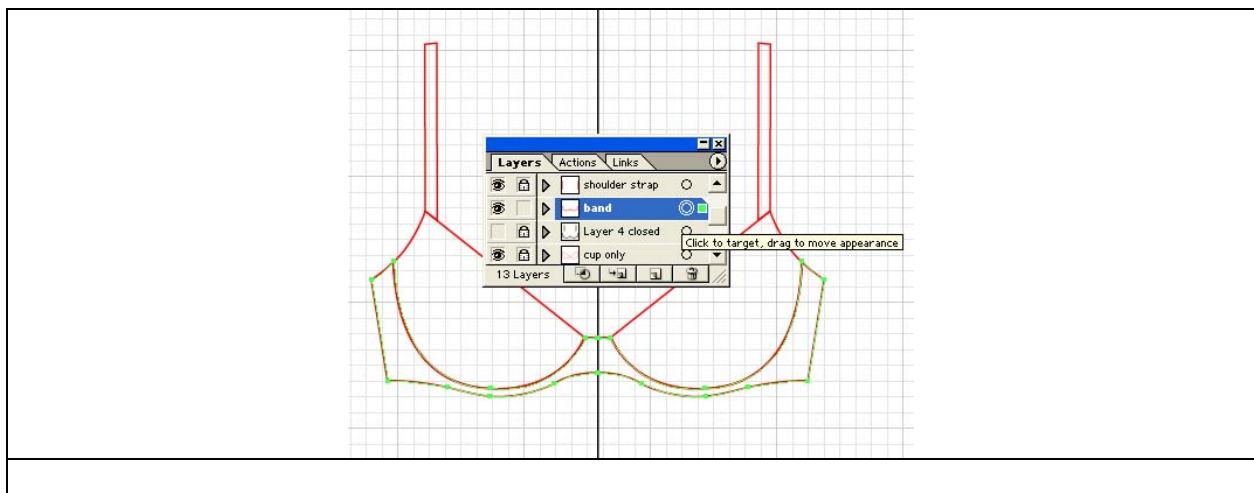


Figure 3. An example of screen image of instructional video clips.

Production of Deliverables

The technical sketch made using Adobe Illustrator on the computer screen is captured by 'Camtasia' by Techsmith. Use of key board, whilst creating a technical sketch on the computer, is also captured by DVD camcorder and the captured screen is then edited and combined with images of keyboard functions in order to maximize student understanding. After editing of the video, scripts of instructions are recorded by a professional English voice-over actor. Then the short videos are converted into web friendly video files in preparation for uploading and publishing to the online

learning platform. The final stage of production involved creating a website to which the instructional video clip files are uploaded, and then accessed by students and staff.

Developing Generic Skills and Metacognitive Skills through E-Learning

Most academics now accept that web-based or e-learning is here to stay and it is no longer a question of whether to use e-learning in a university course, rather one of how it is to be used to best effect [18]. Consequently, in order to be successful, increasing numbers of online students are required to move from expectations of being told ‘what to learn and when to learn it’ to a more complex learning environment which requires the adoption of a more self-regulatory approach in order to achieve success [19, 20]. In many ways, this self-regulatory approach is very similar to what will be expected of many graduates when they leave higher education and enter the workplace [21] and is consequently a desirable side-effect of e-learning. Generic skills that can be developed at university and transferred to the workplace are increasingly seen as part of the ‘added-value’ of higher education brought about in part by the adoption of a competence or outcomes based approach, which Fuller and Unwin [22] suggests does little to prepare employees for change and future workplace roles, unless supported through the development of metacognitive skills like problem-solving and critical reflection.

Through this proposed project, students not only learn the practical skills of how to use Adobe Illustrator, but also learn how to manage or self-regulate and control the whole learning process through using their time effectively, focusing their attention, and maintaining their concentration over time.

Conclusion

The extent to which the authors have been successful is best measured against the outcomes identified for the design of the online learning activities which can be summarised as follows. The design of the online teaching and learning activities (TLA’s) and instructional material should be:

1. In accordance with the principles of outcomes based teaching and learning (OBTL).
2. Constructively aligned with the selected intended learning outcomes.
3. Consistent with Tufte’s [7] principles of graphical excellence communicating complex ideas with clarity, precision, and efficiency.
4. Adding value to the student learning environment by designing teaching and learning activities which maximize the benefits of an online learning environment, such as that provided by Web CT.
5. Encouraging student reflection on both the topic and their understanding of it.

Whilst the authors have only been able to present a small sample of the exemplar course, this nonetheless clearly demonstrates that creative use of online teaching and learning activities can add significant value to the creation of a student-centred reflective learning environment [23] and facilitate improvements in achievement of intended learning outcomes within an OBTL framework. Of course the most rigorous measure of success is the extent to which each **student** perceives the online TLA’s as contributing to **their** achievement of the course intended learning outcomes, and the feedback received from one semester of running this course attests to exceptionally high student satisfaction levels evidenced quantitatively by student responses to Teaching Feedback

Questionnaires (TFQ's) and qualitatively through feedback from student representatives at programme management board meetings.

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